



**PAC REFERENCE NUMBER NE 142 12**

IHSS Reference Number 142 12 Operable Unit 6

Unit Name Flume Pond (Walnut Creek Gauging Station) (IAG Name Retention Pond A 5 RFI/RI Name Walnut and Indiana Pond)

Approximate Location N754 000 E2 094 000

Date(s) of Operation or Occurrence

Fall 1978 to present

**DRAFT**

Description of Operation or Occurrence

As stated in the *Historical Release Report for the Rocky Flats Plant* (DOE 1992) the flume pond is located on the Walnut Creek drainage immediately west of and upstream from Indiana Street. The flume pond was built at the same time that McKay Ditch was being rerouted away from the A Series drainage. This flume pond is used to measure Walnut Creek flow. The Walnut Creek drainage has received discharges from Rocky Flats throughout the history of the plant. This pond was identified as an IHSS in the IAG.

Physical/Chemical Description of Constituents Released

The constituents potentially present in this IHSS are the same constituents as are potentially present in North Walnut Creek or South Walnut Creek (A Series or B Series drainages) as well as the McKay Ditch Bypass.

Response to Operation or Occurrence

This pond is cleaned out occasionally to reduce buildup of sediments on the bottom or to reconstruct the flumes. The sediments are placed on the south side of Walnut Creek upstream of the pond and within the IHSS boundary. A primary source of these sediments is the McKay Ditch Bypass which was originally constructed as an unlined ditch and therefore carried considerable amounts of entrained sediments.

In 1991 the flume pond was included in the IAG as IHSS 142 12 and slated for further study as part of the OU 6 RFI/RI. During the OU 6 field investigation (1992 through 1993) sediment samples were collected at five different locations within the pond. One sample was collected within 5 feet of the pond inlet, one from the deepest part of the pond, and the remaining three samples were collected at random locations. Composite samples were collected from 2 foot intervals. Soil samples were analyzed for VOCs, SVOCs, pesticides/PCBs, metals, radionuclides, and water quality parameters. Five surface water samples were

collected from the pond one from the deepest part one within 5 feet of the inlet one within 5 feet of the spillway and two randomly collected Surface water samples were analyzed for VOCs SVOCs pesticides/PCBs metals (total and dissolved) radionuclides (total and dissolved) and water quality parameters Two stream sediment samples were also collected one sample was collected from McKay Ditch just upstream from its confluence with Walnut Creek and another was collected on Walnut Creek just downstream from the pond spillway These stream sediment samples were analyzed for VOCs SVOCs pesticides/PCBs metals radionuclides and water quality parameters Groundwater samples were collected from two downgradient alluvial monitoring wells (0486 and 41691)

### Fate of Constituents Released to the Environment

From the media sampled in IHSS 142 12 during the OU 6 RFI/RI only surface water and sediments were evaluated for No Action in this update Groundwater issues are being addressed on a site wide basis initially through the Groundwater Conceptual Plan for RFETS A CDPHE risk based conservative screen was conducted on surface water pond sediment and stream sediment for IHSS 142 12 The results of this screen are reported in the final OU 6 Letter Report (DOE 1994) A background comparison was conducted as the first part of the conservative screen none of the inorganic and radionuclide constituents in these media were detected in concentrations greater than background (mean plus 2 standard deviations as defined by CDPHE) All organic chemicals detected in each media are considered PCOCs and are listed in Table 1 Although acetone was originally included in the conservative screen as the only surface water PCOC subsequent comparison to laboratory blank data indicates that its presence in surface water samples was due to laboratory contamination

### Action/No Action Recommendation

In accordance with the No Action decision criteria developed mutually by DOE EPA CDPHE Kaiser Hill and RMRS (RMRS 1996) any geographic area that passes the CDPHE conservative screen is a candidate for No Action Passing the conservative screen requires a carcinogenic and noncarcinogenic risk ratio sum of below 1 each As seen in Table 1 for pond sediment the carcinogenic ratio sum is  $2.84 \times 10^{-3}$  and the noncarcinogenic ratio sum is  $3.34 \times 10^{-5}$  Both of these values are below 1 These ratios differ somewhat from those presented in the OU 6 Letter Report (DOE 1994) because methylene chloride was subsequently determined to be a laboratory contaminant and was omitted from the data set (DOE 1995a) Results of the screen on stream sediment samples (Table 1) show a carcinogenic risk ratio sum of  $3.73 \times 10^{-3}$  and a noncarcinogenic risk ratio sum of  $3.36 \times 10^{-5}$  both sums are below 1

IHSSs that pass this initial portion of the CDPHE conservative screen must also be assessed for risk due to dermal exposure As shown in Table 2 the carcinogenic and noncarcinogenic risk ratio sums for dermal exposure to both pond and stream sediment are below 1 Tables 1 and 2 indicate that the risk to human health from exposure to pond and stream sediment at

IHSS 142 12 would be minimal based on the exposure assumptions for the residential scenario

The No Action decision criteria (RMRS 1996) state that a geographic area that passes the CDPHE conservative screen must also undergo an ERA before it can proceed through the NFA process. Because the draft *Ecological Risk Assessment for Walnut Creek and Woman Creek Watersheds at Rocky Flats Environmental Technology Site* which appears as Appendix F in the OU 6 RFI/RI report (DOE 1995a) is already available the results from this assessment were used to determine the potential ecological threat from exposure to sediment constituents at IHSS 142 12. According to the ERA there is little risk to the environment based on chemical concentrations detected in this IHSS

Based on the above evidence the No Action decision criteria are met for IHSS 142 12 Walnut and Indiana Pond

#### Comments

None

#### References

DOE 1992 *Historical Release Report for the Rocky Flats Plant* Rocky Flats Environmental Technology Site Golden CO June

DOE 1994 *Letter Report on the Colorado Department of Public Health and Environment Source Area Delineation and Risk based Conservative Screen and the Environmental Protection Agency Areas of Concern Delineation for the Human Health Risk Assessment Walnut Creek Priority Drainage Operable Unit No 6* Rocky Flats Environmental Technology Site Golden CO October

DOE 1995a, *Phase I RFI/RI Report on the Walnut Creek Priority Drainage Operable Unit No 6 (Draft)* Rocky Flats Environmental Technology Site Golden CO September

DOE 1995b *Programmatic Risk based Preliminary Remediation Goals Final Revision 3* Rocky Flats Environmental Technology Site Golden CO August

Rocky Mountain Remediation Services (RMRS) 1996 *No Action/No Further Action/No Further Remedial Action (NFA) Decision Criteria for Rocky Flats Environmental Technology Site* IN Rocky Flats Cleanup Agreement Public Comment Draft March 14 1996 Golden CO February

**Table 1 RBC<sup>1</sup> Screen for IHSS 142 12 Walnut and Indiana Pond**

**Pond Sediment**

Analyte <sup>2</sup>	Maximum Concentration (mg/kg)	Residential Soil RBCs		Ratio of Concentration to RBC	
		Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic
<b>Organics</b>					
2 Butanone	0 051		1 65E+05		3 09E-07
Acetone	0 21		2 74E+04		7 66E-06
Benzoic Acid	0 5		1 10E+06		4 55E-07
bis(2 Ethylhexyl)phthalate	0 13	4 57E+01	5 43E+03	2 84E-03	2 39E-05
Phenol	0 11		1 65E+05		6 67E-07
Toluene	0 018		5 49E+04		3 28E 07
			<b>Ratio Sum</b>	<b>2 84E-03</b>	<b>3 34E-05</b>

**Stream Sediment**

Analyte <sup>3</sup>	Maximum Concentration (mg/kg)	Residential Soil RBCs		Ratio of Concentration to RBC	
		Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic
<b>Organics</b>					
Benzoic Acid	0 17		1 10E+06		1 55E-07
Benzyl alcohol	0 041		8 23E+04		4 98E-07
bis(2 Ethylhexyl)phthalate	0 17	4 57E+01	5 43E+03	3 72E-03	3 13E 05
Di n butyl phthalate	0 045		2 74E+04		1 64E-06
			<b>Ratio Sum</b>	<b>3 72E-03</b>	<b>3 36E-05</b>

<sup>1</sup> RBC = Risk based concentration chemical-specific RBCs are presented in the Programmatic Risk based Preliminary Remediation Goals (DOE 1995b) The RBCs used in this conservative screen were based on a residential scenario for exposure to soil

<sup>2</sup> Methylene chloride was originally included in the RBC screen however subsequent comparison to laboratory blank data indicate that its presence in pond sediment samples is due to laboratory contamination

<sup>3</sup> Benzoic acid and bis(2-ethylhexyl)phthalate were detected in the stream sediment sample collected in McKay Ditch upstream from its confluence with North Walnut Creek Benzyl alcohol and di n butyl phthalate were detected in the stream sediment sample collected from Walnut Creek just downstream from the pond spillway

5

Table 2 RBC Screen for IHSS 142 12 -- Dermal Exposure

Pond Sediment

Analyte	Maximum Concentration (mg/kg)	Oral Slope Factor <sup>1</sup>	Oral RfD <sup>1</sup>	Carcinogenic Intake Factor <sup>2</sup>	Noncarcinogenic Intake Factor <sup>2</sup>	Residential Dermal RBCs (mg/kg) <sup>3</sup>		Ratio of Concentration to RBC	
						Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic
2 Butanone	0 051		6 00E 01		2 80E 07		2 14E+06		2 38E-08
Acetone	0 21		1 00E 01		2 80E 07		3 57E+05		5 88E-07
Benzoic Acid	0 5		4 00E+00		2 80E 07		1 43E+07		3 50E-08
bis(2 Ethylhexyl)phthalate	0 13	1 40E 02	2 00E 02	8 54E 08	2 80E 07	8 36E+02	7 14E+04	1 55E 04	1 82E-06
Phenol	0 11		6 00E 01		2 80E 07		2 14E+06		5 13E-08
Toluene	0 018		2 00E 01		2 80E 07		7 14E+05		2 52E-08
						Dermal Ratio Sum		1 55E 04	2 54E-06
						Screen Ratio Sum		2 84E 03	3 34E-05
						Total Ratio Sum		3 00E-03	3 59E-05

Stream Sediment

Analyte	Maximum Concentration (mg/kg)	Oral Slope Factor <sup>1</sup>	Oral RfD <sup>1</sup>	Carcinogenic Intake Factor <sup>2</sup>	Noncarcinogenic Intake Factor <sup>2</sup>	Residential Dermal RBCs (mg/kg) <sup>3</sup>		Ratio of Concentration to RBC	
						Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic
Benzoic Acid	0 17		4 00E+00		2 80E 07		1 43E+07		1 19E-08
Benzyl alcohol	0 041		3 00E 01		2 80E 07		1 07E+06		3 83E-08
bis(2 Ethylhexyl)phthalate	0 17	1 40E 02	2 00E 02	8 54E 08	2 80E 07	8 36E+02	7 14E+04	2 03E 04	2 38E-06
Di n butyl phthalate	0 045		1 00E 01		2 80E 07		1 65E+04		2 73E-06
						Dermal Ratio Sum		6 20E 03	7 70E-05
						Screen Ratio Sum		3 72E 03	3 36E-05
						Total Ratio Sum		9 92E-03	1 11E-04

<sup>1</sup> DOE 1995b Units of slope factors are risk per mg chemical/kg body weight-day units of reference dose (RfDs) are mg/chemical/kg body weight-day

Oral toxicity criteria were not adjusted for absorption or other corrections applicable to dermal contact

<sup>2</sup> Intakes were calculated using assumptions and equation shown in the OU 6 Letter Report (DOE 1994) Units are kg soil/kg body weight-day

<sup>3</sup> Carcinogenic RBC = target risk/(intake factor x slope factor) noncarcinogenic RBC = (target hazard index x RfD)/intake factor

**PAC REFERENCE NUMBER NE-166 1 NE 166 3**

IHSS Reference Number 166 1 166 3 Operable Unit 6

Unit Name Trenches South of the Present Landfill (IHSS Name Trenches A B and C Trench C consists of two smaller trenches)

Approximate Location N752 000 E2 084 000

Date(s) of Operation or Occurrence

**DRAFT**

Prior to 1964 and also 1970 (see discussion below for explanation)

Description of Operation or Occurrence

As stated in the *Historical Release Report for the Rocky Flats Plant* (DOE 1992) conflicting information has been found regarding the description of the operation or occurrence Listed below are four explanations for the existence of these trenches

- 1 According to one reference these trenches received a few hundred gallons of liquid from the RFP sanitary wastewater treatment plant (Building 995) in 1970 A map with that reference indicates only one trench in the area
- 2 RCRA 3004(u) states that sludge from Building 995 was disposed of in two trenches and possibly in a third trench near the landfill This sludge was generated during a period of high sewage sludge output from Building 995 but no other time frame for these activities is given
- 3 A brief discussion of possible sludge disposal out north of the plant is found This document also discusses sludge disposal by Austin (a construction firm) to the north of the plant The source of this waste was the number 1 digester at Building 995
- 4 Another reference states that the sanitary sewage sludge that was disposed of in this area was simply pumped on the ground and never actually trenched

Photographs of the RFP do not indicate any disturbances in the location of these trenches in 1955 but in 1964 disturbed areas corresponding to these three trenches are visible The disturbed areas do not show significant change in 1971 (the year following that in which wastes were supposedly disposed in them according to one reference) nor in any other photographs taken after 1964

### Physical/Chemical Description of Constituents Released

The material reported to be placed in this unit consisted of sanitary waste water treatment plant sludge. Older sludge would have had primarily uranium contamination with newer sludge having an increasing amount of plutonium contamination. Total long lived alpha activity present in the sludge has been reported between a minimum of 382 pCi/g in August 1964 to a maximum of 3 591 pCi/g in June 1960 (DOE 1992). Analysis of soil samples collected during exploratory drilling did not indicate any radioactivity.

Prior to the issuance of the HRR (DOE 1992) a number of documents were located that make reference to the existence of data (uranium, 2 butanol, 1, 1, 1 TCA, TCE, and toluene have been detected in Trench A soil) from Trench A near the landfill. A search for these data was made but none were found.

### Response to Operation or Occurrence

Some soil sampling at these trenches in the late 1970s or early 1980s did not reveal any radioactivity. In 1991 Trenches A, B, and C were included in the IAG as IHSSs 166 1, 166 2, and 166 3 respectively and slated for further study as part of the OU 6 RFI/RI. During the OU 6 field investigation (1992-1993) 26 soil borings were drilled to a depth of 5 feet below the bottom of each trench. Eight borings were drilled in Trench A, seven in Trench B, six in Trench C west, and five in Trench C east. Soil samples were analyzed for VOCs, metals, and radionuclides. In addition, five existing monitoring wells located in the vicinity of these trenches were sampled. Groundwater samples were analyzed for VOCs, semi-VOCs, pesticides/PCBs, metals, and gross alpha and beta.

### Fate of Constituents Released to the Environment

The results of the CDPHE conservative screen on the soil samples collected from IHSSs 166 1, 166 2, and 166 3 as reported in the final OU 6 Letter Report (DOE 1994) indicate that any constituents released to the environment from the soil medium present negligible risk to human health and the environment. The background comparison conducted as part of the conservative screen resulted in the inorganic and radionuclide PCOCs shown in Table 1. All organic constituents detected in the soil samples are considered PCOCs and are also listed in Table 1.

The results of the CDPHE conservative screen on the groundwater samples collected from the five nearby monitoring wells (DOE 1994) suggest that residential exposure to groundwater in the vicinity of IHSS 166 could be a threat to human health. Table 2 lists the carcinogenic ratio sum as  $1.95 \times 10^3$  and the noncarcinogenic ratio sum as  $7.50 \times 10^1$ . These ratio sums differ somewhat from those reported in the final OU 6 Letter Report for the following reasons:

Only data from the five nearby monitoring wells were used in Table 2 the final OU 6 Letter Report uses data from all wells within the drainage basin of No Name Gulch (the unnamed northern tributary to Walnut Creek) These data were obtained from Section 4 0 Nature and Extent of Contamination of the OU 6 RFI/RI report (DOE 1995a)

The RBCs used in Table 2 were taken from the August 1995 *Programmatic Risk based Preliminary Remediation Goals* (DOE 1995b) which includes the most recent toxicity and exposure factors

Trenches A B and C do not appear to be the source of groundwater contamination in the nearby wells The metals detected in unfiltered groundwater samples are probably naturally occurring and are likely associated with elevated TSS in the groundwater samples Elevated levels of TSS can occur when there is insufficient groundwater at the monitoring well to permit adequate well development prior to sampling In fact well 7287 which has all the maximum concentrations of total metals (except for selenium) detected in the same sample also has the highest concentration of TSS detected in the same sample (17 000 mg/l compared to the second highest concentration of 9 382 mg/l) The only dissolved metals detected in this well above the background mean plus two standard deviations were zinc and copper

The trenches also do not appear to be the source of organic contaminants in the local groundwater because the low concentrations of most chlorinated solvents in soil are not likely to have measurable effects on groundwater Furthermore the soil samples exhibiting chlorinated solvent concentrations were collected below the water table in Trench A borings suggesting groundwater as the source of contaminants in those samples More probable sources of groundwater contamination such as the landfill are nearby The OU 6 Letter Report provides detailed evidence to support this conclusion

#### Action/No Action Recommendation

In accordance with the NFA decision criteria developed mutually by DOE EPA CDPHE Kaiser Hill and RMRS (RMRS 1996) any geographic area that passes the CDPHE conservative screen is a candidate for NFA Passing the conservative screen requires a carcinogenic and noncarcinogenic risk ratio sum of below 1 each As seen in Table 1 the carcinogenic ratio sum for soils is 8 81E 01 and the noncarcinogenic ratio sum for soils is 1 57E 01 both of these values are below 1 IHSSs that pass this initial portion of the CDPHE conservative screen must also be assessed for risk due to dermal exposure (Table 3) The carcinogenic and noncarcinogenic risk ratio sums for methylene chloride and barium are 3 46E 5 and 1 19E 03 respectively These two constituents were selected for dermal assessment because they were the largest contributors to the ratio sum shown in Table 1 Tables 1 and 3 indicate that the risk to human health from exposure to soil at IHSS 166 would be minimal based on the exposure assumptions for the residential scenario

The NFA decision criteria (RMRS 1996) states that a geographic area that passes the CDPHE conservative screen must also undergo an ERA before it can proceed through the NFA process. Because the *Ecological Risk Assessment for Walnut Creek and Woman Creek Watersheds at Rocky Flats Environmental Technology Site* which appears as Appendix F in the OU 6 RFI/RI (DOE 1995a) is already available, the results from this assessment were used to determine the potential ecological threat from exposure to soil constituents at IHSS 166. According to the ERA, there is no apparent risk to the environment based on chemical concentrations detected in IHSS 166. The initial ERA screen revealed the only potential ecological risk is to vegetation from exposure to strontium in subsurface soils. However, because the resulting hazard quotient of 1.5 is so close to 1 and there are no signs of stressed vegetation in this area, it was determined that there was no threat to the environment from constituents detected at IHSS 166.

Based on the above evidence, the NFA decision criteria are met and no action is warranted for the soils at IHSSs 166.1, 166.2, and 166.3 Trenches A, B, and C.

#### Comments

This update to the HRR does not include a No Action recommendation for groundwater. The groundwater in the vicinity of this IHSS is being examined further in the IM/IRA process for OU 7 and will also be addressed through the Sitewide Groundwater Conceptual Plan.

#### References

DOE 1992 *Historical Release Report for the Rocky Flats Plant* Rocky Flats Plant Golden CO June

DOE 1994 *Letter Report on the Colorado Department of Public Health and Environment Source Area Delineation and Risk based Conservative Screen and the Environmental Protection Agency Areas of Concern Delineation for the Human Health Risk Assessment Walnut Creek Priority Drainage Operable Unit No. 6* Rocky Flats Environmental Technology Site Golden CO October

DOE 1995a, *Phase I RFI/RI Report on the Walnut Creek Priority Drainage Operable Unit No. 6* Rocky Flats Environmental Technology Site Golden CO September

DOE 1995b *Programmatic Risk based Preliminary Remediation Goals Final Revision 3* Rocky Flats Environmental Technology Site Golden CO August

RMRS 1996 *No Action/No Further Action/No Further Remedial Action (NFA) Decision Criteria for Rocky Flats Environmental Technology Site* IN Rocky Flats Cleanup Agreement Public Comment Draft March 14, 1996 Golden CO February

Table 1 RBC<sup>1</sup> Screen for IHSSs 166 1 166 3 (Trenches) – Soils 1 to 12 Feet

Analyte <sup>2</sup>	Maximum Concentration or Activity	Depth of Sample (in ft)	Residential Soil RBCs		Ratio of Concentration to RBC	
			Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic
<b>Organics (mg/kg)</b>						
Acetone <sup>3</sup>	0 02	7 8		2 74E+04		7 30E 07
Benzene	0 006	8 9	2 21E+01		2 71E-04	
2 Butanone	1 6	4 5		1 65E+05		9 70E-06
Chloroform	0 002	7 8	1 05E+02	2 74E+03	1 90E-05	7 30E-07
4 Methyl 2 pentanone	0 002	11 12		2 20E+04		9 09E-08
Methylene chloride <sup>3</sup>	0 054	7 8	8 54E+01	1 65E+04	6 32E-04	3 27E-06
Styrene	0 001	7 8		5 49E+04		1 82E-08
Trichloroethene	0 021	7 9	5 82E+01		3 61E 04	
Toluene	0 59	0 1		5 49E+04		1 07E-05
<b>Inorganics (mg/kg)</b>						
Barium	2970	6 12		1 92E+04		1 55E 01
Chromium	130	6 12		2 74E+05		4 74E-04
Strontium	264	0 6		1 65E+05		1 60E-03
<b>Radionuclides<sup>4</sup> (pCi/g)</b>						
Americium 241	0 0229	11 12	1 90E+00		1 21E-02	
Plutonium 239/240	0 0855	11 12	2 51E+00		3 41E-02	
Uranium 235	0 13	0 6	1 56E 01		8 33E 01	
<b>Ratio Sum</b>					<b>8 81E-01</b>	<b>1 57E-01</b>

<sup>1</sup> RBC = Risk based concentration chemical specific RBCs are presented in the Programmatic Risk based Preliminary Remediation Goals (DOE 1995b) The RBCs used in this conservative screen were based on a residential scenario for exposure to soil

<sup>2</sup> Only metals and radionuclides with concentrations or activities greater than background mean plus 2 standard deviations are listed

<sup>3</sup> Maximum concentrations of acetone and methylene chloride differ from those reported in the Letter Report Subsequent comparison to laboratory blank data indicated that much of their presence in subsurface soils at these IHSSs were due to laboratory contamination Only those values greater than 10 times the concentration detected in laboratory blanks were retained as valid data (DOE 1995a)

<sup>4</sup> For radionuclides listed with more than one isotope the more conservative RBC was used

**Table 2 RBC<sup>1</sup> Screen for IHSSs 166 1 166 3 (Trenches) – Unfiltered Groundwater**

Analyte <sup>2</sup>	Maximum Concentration or Activity <sup>3</sup>	Well ID	Residential Groundwater RBCs		Ratio of Concentration to RBC	
			Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic
<b>Organics (mg/l)</b>						
1 1 1 Trichloroethane	0 007	7287				
1 1 Dichloroethane	0 005	B206489		1 01E+00		4 95E-03
1 2 Dichloroethene	0 006	7287		3 29E-01		1 82E-02
Acetone	0 017	7087		3 65E+00		4 66E-03
Benzene	0 002	B206489	6 17E-04		3 24E+00	
Carbon disulfide	0 004	7087		2 76E-02		1 45E-01
Carbon tetrachloride	0 008	7287	2 60E-04	2 55E-02	3 08E+01	3 14E-01
Chloroform	0 008	7287	2 76E-04	3 65E-01	2 90E+01	2 19E-02
Ethylbenzene	0 0007	B206489		1 58E+00		4 43E-04
Methylene chloride	0 003	7087	6 22E-03	1 73E+00	4 82E-01	1 73E-03
Tetrachloroethene	0 013	7287	1 43E-03	3 65E-01	9 09E+00	3 56E-02
Toluene	0 008	B206489		9 65E-01		8 29E-03
Total xylenes	0 004	B206489		7 30E+01		5 48E-05
Trichloroethene	0 15	7287	2 55E-03		5 88E+01	
					1 31E+02	5 55E-01
<b>Total Metals (mg/l)</b>						
Aluminum	456	7287		1 02E+02		4 47E+00
Antimony	0 0614	7287		1 46E-02		4 21E+00
Arsenic	0 0099	7287	4 86E 05	1 09E-02	2 04E+02	9 08E-01
Barium	5 06	7287		2 56E+00		1 98E+00
Beryllium	0 032	7287	1 98E-05	1 82E-01	1 62E+03	1 76E 01
Cadmium	0 019	7287		1 83E-02		1 04E+00
Chromium	0 58	7287		3 65E+00		1 59E-01
Cobalt	0 228	7287		2 19E+00		1 04E 01
Copper	6 43	7287		1 46E+00		4 40E+00
Lead	0 193	7287				
Lithium	0 266	7287				
Manganese	6 2	7287		1 83E-01		3 39E+01
Mercury	0 0014	7287		1 10E-02		1 27E-01
Nickel	1 07	7287		7 30E-01		1 47E+00
Selenium	0 22	B206689		1 83E-01		1 20E+00
Silver	3 04	7287		1 83E 01		1 66E+01
Strontium	1 74	7287		2 19E+01		7 95E-02
Vanadium	0 754	7287		2 56E-01		2 95E+00
Zinc	8	7287		1 10E+01		7 27E-01
					1 82E+03	7 45E+01
<b>Radionuclides (pCi/l)</b>						
Cesium 137	1 063	7287	1 51E+00		7 04E 01	
				<b>Ratio Sum</b>	<b>1 95E+03</b>	<b>7 50E+01</b>

<sup>1</sup> RBC = Risk based concentration chemical specific RBCs are presented in the Programmatic Risk based Preliminary Remediation Goals (DOE 1995b) The RBCs used in this conservative screen were based on a residential scenario for exposure to groundwater

<sup>2</sup> Only metals and radionuclides with concentrations or activities greater than background mean plus 2 standard deviations are listed

<sup>3</sup> Data obtained from OU 6 RFI/RI report (DOE1995a)

12

**Table 3 RBC Screen for IHSSs 166 1 166 2 and 166 3 -- Dermal**

Analyte <sup>1</sup>	Max Conc (mg/kg)	Oral Slope Factor <sup>2</sup>	Oral RfD <sup>2</sup>	Cancer Intake Factor <sup>3</sup>	Noncancer Intake Factor <sup>3</sup>	Residential Dermal RBCs (mg/kg) <sup>4</sup>		Ratio of Conc to RBC	
						Cancer	Noncancer	Cancer	Noncancer
Methylene chloride Barium	0 054	7 50E-03	6 00E-02	8 54E-08	2 80E-07	1 56E+03	2 14E+05	3 46E-05	2 52E-07
	2970		7 00E 02	8 54E-09	2 80E-08		2 50E+06		1 19E-03
							<b>Ratio Sum</b>	<b>3.46E-05</b>	<b>1 19E-03</b>

<sup>1</sup> Analytes that were the largest contributors to the ratio sum in Table 1 were selected for the dermal exposure comparison. Radionuclides are not evaluated because they have small dermal permeability constants.

<sup>2</sup> Units of slope factors are risk per mg chemical/kg body weight-day. Units of reference doses (RfDs) are mg/chemical/kg body weight-day. Oral toxicity criteria were not adjusted for absorption or other corrections applicable to dermal contact.

<sup>3</sup> Calculated using assumptions and equations presented in the OU 6 Letter Report (DOE 1994). Units are kg soil/kg body weight-day.

<sup>4</sup> Carcinogenic RBC = target risk/(intake factor x slope factor). Noncarcinogenic RBC = (target hazard index x reference dose)/intake factor.

## PAC REFERENCE NUMBER 167 3

IHSS Reference Number F167 3 Operable Unit 6  
Unit Name Former South Area Spray Field  
Approximate Location N748 000 E2 075 900

### Date(s) of Operation or Occurrence

# DRAFT

Began May 1974 stop date unknown

### Description of Operation or Occurrence

The periods during which the South Area Spray Field (IHSS 167 3) was operational are not precisely known. However, as stated in the *Historical Release Report for the Rocky Flats Plant* (DOE 1992a), spray evaporation of the east landfill pond water along the north and south banks of the pond is believed to have begun approximately in May 1974. The South Area Spray Field was used solely for the purpose of spraying water over the ground surface to enhance evaporation of the water from the ponds located near the present landfill. Spray evaporation was conducted to prevent the release of water from the landfill ponds. The landfill ponds were intended to protect surface water and groundwater in the vicinity of the landfill.

### Physical/Chemical Description of Constituents Released

The water sprayed onto the South Area Spray Field contained varying amounts of low level radioactivity derived from tritium, strontium, plutonium, and americium (DOE 1995). Low concentrations of phenol and nitrate were also detected in the spray water.

### Response to Operation or Occurrence

The South Area Spray Field was included in the IAG as IHSS 167 3 and slated for further study as part of the OU 6 RFI/RI. The original location of the South Area Spray Field, as described in the IAG and the OU 6 Work Plan (DOE 1992b), was south of the OU 7 Landfill on the plateau between an unnamed tributary and North Walnut Creek. During the OU 6 characterization activities, it was determined that the South Area Spray Field was actually located further north, adjacent to the south bank of the east landfill pond. The location of IHSS 167 3 was officially revised in the HRR (DOE 1992a) based on reevaluation of aerial photographs and other historical records of waste disposal practices. The original IAG IHSS 167 3 location was redesignated by OU 6 as the Former South Area Spray Field (IHSS F167 3) to distinguish it from the current IHSS 167 3 that was

addressed during the OU 7 characterization. Because the Former South Area Spray Field was sampled during the OU 6 characterization, it was retained in the OU 6 RFI/RI for completeness and because an aerial photograph suggested its use as a spray field, this location is not formally considered an IHSS. The Former South Area Spray Field is presently covered by grasses common to the Rocky Flats area.

The sample collection points are located due south and outside of the official IHSS boundaries as defined in the HRR. Therefore, the following discussion addresses only those constituents detected in the sampled area and is not necessarily indicative of conditions within the revised IHSS 167.3 boundaries, just south of the pond.

Eight surface water samples were collected in IHSS F167.3 and analyzed for metals, radionuclides, and TOC. Nine soil borings were also drilled in this former IHSS and sampled in 2-foot intervals to a depth of 4 feet. These subsurface soil samples were analyzed for metals, radionuclides, and TOC. In addition, subsurface soil samples were collected during the installation of monitoring well 76792, located north of IHSS F167.3 in the drainage that flows toward the unnamed tributary north of North Walnut Creek. These samples were analyzed for VOCs, metals, radionuclides, and TOC. As of the 4th quarter of 1994, this monitoring well remained dry and undeveloped.

#### Fate of Constituents Released to the Environment

A CDPHE risk-based conservative screen was conducted on soil samples collected from IHSS F167.3. Because CDPHE considers soil samples collected from as far as 12 feet deep to be surface soil under the conservative residential exposure scenario, data from the surface and subsurface soil samples were combined into one data set. The maximum analyte concentrations were then taken from this combined data set for use in the screen. The results of the screen for IHSS F167.3 are reported in the final OU 6 Letter Report (DOE 1994). The background comparison (mean plus 2 standard deviations, as defined by CDPHE) conducted as part of the conservative screen resulted in the inorganic and radionuclide PCOCs of chromium, lead, strontium, zinc, americium-241, and plutonium-239/240. All organic chemicals detected in soils samples are considered PCOCs and are 2-butanone, methylene chloride, and toluene. These VOCs may be laboratory or field contaminants rather than environmental constituents; it is unlikely that soil at IHSS F167.3 is a source of groundwater contamination.

#### Action/No Action Recommendation

In accordance with the No Action decision criteria developed mutually by DOE, EPA, CDPHE, Kaiser Hill, and RMRS (RMRS 1996), any geographic area that passes the CDPHE risk-based conservative screen is a candidate for No Action. Passing the conservative screen requires a carcinogenic and noncarcinogenic risk ratio sum of below 1 each. As seen in Table 1, the carcinogenic ratio sum for soil is 1.49E-01 and the noncarcinogenic ratio sum for soil is 3.78E-03. Both of these values are below 1.

IHSSs that pass this initial portion of the CDPHE risk based conservative screen must also be assessed for risk due to dermal exposure. As shown in Table 2, the carcinogenic and noncarcinogenic risk ratio sums for dermal exposure to soil are  $3.20 \times 10^{-6}$  and  $2.95 \times 10^{-5}$  respectively. Tables 1 and 2 indicate that the risk to human health from exposure to soil at IHSS F167.3 would be minimal based on the exposure assumptions for the residential scenario.

The No Action decision criteria (RMRS 1996) state that a geographic area that passes the CDPHE conservative screen must also undergo an ERA screen before it can proceed through the NFA process. Because the draft *Ecological Risk Assessment for Walnut Creek and Woman Creek Watersheds at Rocky Flats Environmental Technology Site* which appears as Appendix F in the OU 6 RFI/RI (DOE 1995a) is already available, the results from this assessment were used to determine the potential ecological threat from exposure to soil constituents at IHSS F167.3. According to the ERA, there is no apparent risk to the environment based on chemical concentrations detected in IHSS F167.3. The initial ERA screen revealed that the only potential ecological risk is to vegetation from exposure to strontium in subsurface soil. However, because the resulting hazard quotient of 1.5 is so close to 1 and there are no signs of stressed vegetation in this area, it was determined that there was no threat to the environment from constituents detected at IHSS F167.3.

\* Based on the above evidence, the NFA criteria are met and no action is warranted for the soils at IHSS F167.3.

#### Comments

None

#### References

DOE 1992a *Historical Release Report for the Rocky Flats Plant* Rocky Flats Environmental Technology Site, Golden, CO, June

DOE 1992b *Phase I RFI/RI Work Plan for Operable Unit 6, Walnut Creek Priority Drainage* Manual No. 21100 WP OU 6 01 Rocky Flats Plant, Golden, CO, May

DOE 1994 *Letter Report on the Colorado Department of Public Health and Environment Source Area Delineation and Risk based Conservative Screen and the Environmental Protection Agency Areas of Concern Delineation for the Human Health Risk Assessment, Walnut Creek Priority Drainage, Operable Unit No. 6* Rocky Flats Environmental Technology Site, Golden, CO, October

DOE 1995a *Phase I RFI/RI Report on the Walnut Creek Priority Drainage, Operable Unit No. 6 (Draft)* Rocky Flats Environmental Technology Site, Golden, CO, September

DOE 1995b *Programmatic Risk based Preliminary Remediation Goals Final Revision 3*  
Rocky Flats Environmental Technology Site Golden CO August

EPA 1989 *Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A) (Interim Final)* Office of Emergency and Remedial Response  
EPA/540/1 89/002 Washington D C December

EPA 1994 *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities* OSWER Directive No 9355 4 12 Washington D C July 14

RMRS 1996 *No Action/No Further Action/No Further Remedial Action (NFA) Decision Criteria for Rocky Flats Environmental Technology Site* IN Rocky Flats Cleanup Agreement Public Comment Draft March 14 1996 Golden CO February

**Table 1 RBC<sup>1</sup> Screen for Former IHSS 167 3 (South Spray Field) – Soils 1 to 12 Feet**

Analyte <sup>2</sup>	Maximum Concentration or Activity	Depth of Sample (in ft)	Residential Soil RBCs		Ratio of Concentration to RBC	
			Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic
<b>Organics (mg/kg)</b>						
2 Butanone	0.74	4.6		1.65E+05		4.48E-06
Methylene chloride	0.005	0.2	8.54E+01	1.65E+04	5.85E-05	3.03E-07
Toluene	0.091	0.2		5.49E+04		1.66E-06
<b>Inorganics (mg/kg)</b>						
Chromium	72	0.2		2.74E+05		2.63E-04
Lead <sup>3</sup>	68.7	0				
Strontium	341	2.4		1.65E+05		2.07E-03
Zinc	119	0		8.23E+04		1.45E-03
<b>Radionuclides<sup>4</sup> (pCi/g)</b>						
Americium 241	0.064	0	1.90E+00		3.37E-02	
Plutonium 239/240	0.29	0	2.51E+00		1.16E-01	
				<b>Ratio Sum</b>	<b>1.49E-01</b>	<b>3.78E-03</b>

<sup>1</sup> RBC = Risk based concentration. chemical specific RBCs are presented in the Programmatic Risk based Preliminary Remediation Goals (DOE 1995b). The RBCs used in this conservative screen were based on a residential scenario for exposure to soil.

<sup>2</sup> Only metals and radionuclides with concentrations or activities greater than background mean plus 2 standard deviations are listed.

<sup>3</sup> Although no toxicity values exist for lead in soil, the maximum lead concentration of 57.1 mg/kg is well below EPA's screening level of 400 mg/kg for residential soil (EPA 1994).

<sup>4</sup> For radionuclides listed with more than one isotope, the more conservative RBC was used. These RBCs differ from those listed in the OU 6 Letter Report (DOE 1994) because they have been updated with the more recent cancer slope factors.

18

Table 2 RBC Screen for IHSS 167 3 -- Dermal Exposure

Analyte <sup>1</sup>	Maximum Concentration (mg/kg)	Oral Slope Factor <sup>2</sup>	Oral RfD <sup>2</sup>	Carcinogenic Intake Factor <sup>3</sup>	Noncarcinogenic Intake Factor <sup>3</sup>	Residential Dermal RBCs (mg/kg) <sup>4</sup>		Ratio of Concentration to RBC	
						Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic
<b>Organics</b>									
2 Butanone	0 74		6 00E 01		2 80E 07		2 14E+06		3 45E 07
Methylene chloride	0 005	7 50E 03	6 00E 02	8 54E 08	2 80E 07	1 56E+03	2 14E+05	3 20E 06	2 33E-08
Toluene	0 091		2 00E 01		2 80E-07		7 14E+05		1 27E 07
<b>Metals</b>									
Chromium	72		1 00E+00		2 80E 08		3 57E+07		2 02E-06
Strontium	341		6 00E 01		2 80E 08		2 14E+07		1 59E 05
Zinc	119		3 00E-01		2 80E 08		1 07E+07		1 11E 05
<b>Derma Ratio Sum</b>								3 20E 06	2 95E 05
<b>Screen Ratio Sum</b>								1 49E 01	3 78E-03
<b>Total Ratio Sum</b>								<b>1 49E-01</b>	<b>3 81E-03</b>

<sup>1</sup> Radionuclides are not evaluated because dermal uptake is generally not an important route of uptake for radionuclides which have small dermal permeability constants (EPA 1989) Lead was also not included (see Table 1)

<sup>2</sup> DOE 1994 Units of slope factors are risk per mg chemical/kg body weight-day units of reference dose (RfDs) are mg/chemical/kg body weight-day Oral toxicity criteria were not adjusted for absorption or other corrections applicable to dermal contact

<sup>3</sup> Intakes were calculated using assumptions and an equation shown in the OU 6 Letter Report (DOE 1994) Units are kg soil/kg body weight-day

<sup>4</sup> Carcinogenic RBC = target risk/(intake factor x slope factor) noncarcinogenic RBC = (target hazard index x RfD)/intake factor

## PAC REFERENCE NUMBER NE 216 1

IHSS Reference Number 216 1 in Operable Unit 6  
Unit Name East Spray Field North Area  
Approximate Location N750 000 E2 089 000

**DRAFT**

### Date(s) of Operation or Occurrence

PAC NE 216 1 the north area of the East Spray Field was used in the spring of 1989 only

### Description of Operation or Occurrence

The north area (PAC NE 216 1) of the East Spray Field was opened in 1989 because of excessive runoff from the existing east spray fields. The area was closed shortly after opening because of excessive runoff from this new spray field. This spray field was located on the top of a hill between the A Series and B Series drainages east of the fence around the RFP main manufacturing area.

As stated in the *Historical Release Report for the Rocky Flats Plant* (DOE 1992) on February 22, 1989, a chromic acid spill occurred in Building 444. This chromic acid was inadvertently pumped to the sanitary sewer system. Eventually, it was estimated that 4.7 pounds of chromium were discharged to Pond B 3. The water from this pond was then spray irrigated on the north (and south) portions of the East Spray Field. Some of the runoff from the north portion of the East Spray Field was collected in Pond B 5. This incident required the submittal of a RCRA Contingency Plan Implementation Report (Number 89 001).

### Physical/Chemical Description of Constituents Released

During its short operational period, the north area of the East Spray Field received water from Pond B 3, which received treated sanitary effluent from the onsite sewage treatment facility, including the chromic acid inadvertently added to the sanitary waste water.

### Response to Operation or Occurrence

In response to the application of water potentially contaminated with chromium to the north (and south) portions of the East Spray Field, soil samples were collected from the spray fields and analyzed for total chromium using the EPA Extraction Procedure (EP) Toxicity test in order to measure the amount of chromium that is leachable from the soil. The EP Toxicity chromium analyses of these soil samples indicated that background soil concentrations of leachable chromium varied from <0.010 to 0.023 mg/l, whereas the spray field soils had leachable chromium concentrations of <0.010 to 0.082 mg/l. Also in response to these

activities a RCRA Contingency Plan Implementation Report 89 001 was prepared and submitted

The north area of the East Spray Field was included in the IAG as IHSS 216 1 and slated for further study as part of the OU 6 RFI/RI. During the OU 6 field investigation (1992 1993) six surface soil samples were collected and analyzed for metals radionuclides and TOC. In addition six soil borings were drilled to a depth of 4 feet and sampled in 2 foot intervals. Samples were analyzed for VOCs metals radionuclides and TOC. IHSS 216 1 lies in an unsaturated zone between the two drainages therefore no groundwater was available for sampling.

#### Fate of Constituents Released to the Environment

The results of the CDPHE conservative screen for IHSS 216 1 as reported in the final OU 6 Letter Report (DOE 1994) indicate that any constituents released to the environment present negligible risk to human health and the environment. The background comparison conducted as part of the conservative screen resulted in the inorganic and radionuclide PCOCs shown in Table 1. All organic chemicals detected in the soil samples are considered PCOCs and are also listed in Table 1.

#### Action/No Action Recommendation

In accordance with the NFA decision criteria developed mutually by DOE EPA CDPHE Kaiser Hill and RMRS (RMRS 1996) any geographic area that passes the CDPHE conservative screen is a candidate for NFA. Passing the conservative screen requires a carcinogenic and noncarcinogenic risk ratio sum of below 1 each. As seen in Table 1 the carcinogenic ratio sum is  $4.4 \times 10^{-1}$  and the noncarcinogenic ratio sum is  $4.4 \times 10^{-2}$ . Both of these values are below 1. These ratios differ somewhat from those presented in the OU 6 Letter Report because methylene chloride was determined to be a laboratory contaminant and was omitted from the data set (DOE 1995a). IHSSs that pass this initial portion of the CDPHE conservative screen must also be assessed for risk due to dermal exposure (Table 2). The noncarcinogenic risk ratio sum for barium and strontium is  $3.4 \times 10^{-4}$ . These two constituents were selected for dermal assessment because they were the largest contributors to the ratio sum shown in Table 1. Tables 1 and 2 indicate that the risk to human health from exposure to soil at IHSS 216 1 would be minimal based on the exposure assumptions for the residential scenario.

The NFA decision criteria (RMRS 1996) states that a geographic area that passes the CDPHE conservative screen must also undergo an ERA before it can proceed through the NFA process. Because the draft *Ecological Risk Assessment for Walnut Creek and Woman Creek Watersheds at Rocky Flats Environmental Technology Site* which appears as Appendix F in the OU 6 RFI/RI report (DOE 1995a) is already available the results from this assessment were used to determine the potential ecological threat from exposure to soil constituents at IHSS 216 1. According to the ERA there is little risk to the environment based on chemical

concentrations detected in IHSS 216 1 The initial concern in this area, which also includes the soil dump and triangle areas was the consumption of mercury in soil by small mammals that would in turn be consumed by the American kestrel and other terrestrial feeding raptors However the detection frequencies in mercury were so low in the soil samples collected from this area that mercury was dropped from further consideration Therefore it appears from the ERA that the ecological risk from exposure to soil in IHSS 216 1 would be minimal

Based on the above evidence the NFA decision criteria are met and No Action is warranted for IHSS 216 1 north area of the East Spray Field

#### Comments

None

#### References

DOE 1992 *Historical Release Report for the Rocky Flats Plant* Rocky Flats Plant Golden CO June

DOE 1994 *Letter Report on the Colorado Department of Public Health and Environment Source Area Delineation and Risk based Conservative Screen and the Environmental Protection Agency Areas of Concern Delineation for the Human Health Risk Assessment Walnut Creek Priority Drainage Operable Unit No 6* Rocky Flats Environmental Technology Site Golden CO October

DOE 1995a, *Phase I RFI/RI Report on the Walnut Creek Priority Drainage Operable Unit No 6* Rocky Flats Environmental Technology Site Golden CO September

DOE 1995b *Programmatic Risk based Preliminary Remediation Goals Final Revision 3* Rocky Flats Environmental Technology Site Golden CO August

EPA 1994 *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities* OSWER Directive No 9355 4 12 Washington D C July 14

RMRS 1996 *No Action/No Further Action/No Further Remedial Action (NFA) Decision Criteria for Rocky Flats Environmental Technology Site* IN Rocky Flats Cleanup Agreement Public Comment Draft, March 14 1996 Golden CO February

**Table 1 RBC<sup>1</sup> Screen for IHSS 216 1 (East Spray Field) -- Soils 1 to 12 Feet**

Analyte <sup>2</sup>	Maximum Concentration or Activity	Depth of Sample (in ft)	Residential Soil RBCs		Ratio of Concentration to RBC	
			Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic
<b>Organics<sup>3</sup> (mg/kg)</b>						
Acetone	5.1	1.2		2.74E+04		1.86E-04
2-Butanone	3.7	1.2		1.65E+05		2.24E-05
Toluene	0.63	1.2		5.49E+04		1.15E-05
<b>Inorganics (mg/kg)</b>						
Barium	783	0.2		1.92E+04		4.08E-02
Lead <sup>4</sup>	57.1	0				
Strontium	506	2.4		1.65E+05		3.07E-03
<b>Radionuclides<sup>5</sup> (pCi/g)</b>						
Americium 241	0.192	0	1.90E+00		1.01E-01	
Plutonium 239/240	0.758	0	2.51E+00		3.02E-01	
				<b>Ratio Sum</b>	<b>4.03E-01</b>	<b>4.41E-02</b>

<sup>1</sup> RBC = Risk based concentration chemical specific RBCs are presented in the Programmatic Risk-based Preliminary Remediation Goals (DOE 1995b) The RBCs used in this conservative screen were based on a residential scenario for exposure to soil

<sup>2</sup> Only metals and radionuclides with concentrations or activities greater than background mean plus 2 standard deviations are listed

<sup>3</sup> Methylene chloride was originally included in the RBC screen however subsequent comparison to laboratory blank data indicated that its presence in subsurface soil was due to laboratory contamination (DOE 1995a)

<sup>4</sup> Although no toxicity values exist for lead in soil the maximum lead concentration of 57.1 mg/kg is well below EPA's screening level of 400 mg/kg for residential soil (EPA 1994)

<sup>5</sup> For radionuclides listed with more than one isotope the more conservative RBC was used



**Table 2 RBC for IHSS 216 1 -- Dermal**

Analyte <sup>1</sup>	Max Conc (mg/kg)	Oral Slope Factor <sup>2</sup>	Oral RfD <sup>2</sup>	Cancer Intake Factor <sup>3</sup>	Noncancer Intake Factor <sup>3</sup>	Residential Dermal RBCs (mg/kg) <sup>4</sup>		Ratio of Conc to RBC	
						Cancer	Noncancer	Cancer	Noncancer
Barium Strontium	783		7 00E-02		2 80E 08		2 50E+06	-	3 13E-04
	506		6 00E-01		2 80E-08		2 14E+07		2 36E-05
						<b>Ratio Sum</b>		<b>3 37E-04</b>	

<sup>1</sup> Analytes that were the largest contributors to the ratio sum in Table 1 were selected for the dermal exposure comparison. Radionuclides are not evaluated because they have small dermal permeability constants.

<sup>2</sup> Units of slope factors are risk per mg chemical/kg body weight-day; units of reference doses (RfDs) are mg/chemical/kg body weight-day. Oral toxicity criteria were not adjusted for absorption or other corrections applicable to dermal contact.

<sup>3</sup> Calculated using assumptions and equation presented in the OU 6 Letter Report (DOE 1994). Units are kg soil/kg body weight-day.

<sup>4</sup> Carcinogenic RBC = target risk / (intake factor x slope factor); noncarcinogenic RBC = (target hazard index x reference dose) / intake factor.

24

**PAC REFERENCE NUMBER 000-168**

IHSS Reference Number 168 Operable Unit 11

Unit Name West Spray Field

Approximate Location N749 000 E2 078 000

**DRAFT**

Date(s) of Operation or Occurrence

April 1982 through October 1985

Description of Operation or Occurrence

The West Spray Field was used for the periodic spray application of excess water pumped from Solar Evaporation Ponds 207 B North and 207 B Center. When the storage capacity of these ponds was reached, the liquids were pumped to the West Spray Field via an aboveground pipeline for spray application. The sources of waste water stored in the Solar Evaporation Ponds and sprayed at OU 11 included treated sanitary waste water from the Sewage Treatment Plant and groundwater collected in the interceptor trench system north of Building 771. Approximately 66 million gallons from the Solar Evaporation Ponds were sprayed at OU 11 (DOE 1992).

Physical/Chemical Description of Constituents Released

The pond liquids applied to the West Spray Field contained high nitrate concentrations, elevated levels of radionuclides, trace levels of volatile and semivolatile organic compounds, and metals (DOE 1991a).

Response to Operation or Occurrence

The Comprehensive Environmental Assessment and Response Program of 1986 identified IHSS 168 as a SWMU. The IAG of 1991 changed the designation from SWMU to IHSS. The IAG initiated the investigatory program for OU 11 to evaluate the contamination. The Final Phase I RFI/RI Work Plan (DOE 1991b) was completed in 1992. The Final Combined Phases RFI/RI Report (DOE 1995a) was completed in June 1995. The CAD/ROD (DOE 1995b) was approved in October 1995. The investigation determined that IHSS 168 was a low hazard site requiring No Action under a residential use scenario.

Fate of Constituents Released to the Environment

Plutonium 239/240, americium 241, tritium, and nitrate/nitrite were the only constituents identified during the field sampling in 1994 and are considered potential chemicals of concern (PCOCs). Americium and plutonium were identified as PCOCs in surficial soils at

OU 11 have exhibited little migration since spray activities ceased in 1985. Most of the nitrate/nitrite appears to have been taken up as fertilizer by indigenous plants. Tritium as tritiated water would have behaved similarly to regular water but has not been detected at levels above background for OU 11 groundwater. Analysis of the fate and transport characteristics of the PCOCs does not indicate a potential for any changes to the current conditions. The potential for offsite migration of PCOCs appears to be extremely limited.

#### Action/No Action Recommendation

The CDPHE risk based conservative screen was performed on the soil PCOCs using OU 11 data from the surface to a depth of 12 feet. No PCOCs were identified in OU 11 groundwater samples. The total ratio sums for OU 11 are less than 1 indicating a low hazard source area. An evaluation of dermal contact for PCOCs in OU 11 surficial soil confirm this assessment (DOE 1995a). In addition, the screening level ecological risk assessment concluded that past operations at OU 11 have had no significant adverse ecological effects. No negative effects to critical habitats, wetlands, or endangered species were identified. Trends in the ecological data are consistent with effects of supplemental watering and fertilizing in a semiarid grassland. While this may have caused effects to vegetation such as increased biomass and litter, the effects are not detrimental to the grassland ecosystem (DOE 1995b). Based on information presented in the *Final OU 11 Combined Phases RFI/RI Report* (DOE 1995a), a CAD/ROD recommending No Action under CERCLA and Clean Closure under RCRA was prepared (DOE 1995b) and received final approval on September 21, 1995 (see attached declaration).

#### Comments

None

#### References

U S Department of Energy (DOE) 1991a *Draft Phase I RFI/RI Work Plan for the Solar Ponds (OU 4)* Rocky Flats Plant Golden CO June

DOE 1991b *Draft Phase I RFI/RI Work Plan for the West Spray Field (OU 11)* Rocky Flats Plant Golden CO June

DOE 1992 *Historical Release Report for the Rocky Flats Plant* Rocky Flats Plant Golden CO

DOE 1995a *Operable Unit 11 Final Combined Phases RFI/RI Report* Rocky Flats Environmental Technology Site Golden CO June

DOE 1995b *Final Corrective Action Decision/Record of Decision for OU11 West Spray Field* Rocky Flats Environmental Technology Site Golden CO September

**CORRECTIVE ACTION DECISION/RECORD OF DECISION  
DECLARATION**

Site Name and Location

Rocky Flats Environmental Technology Site Operable Unit 11 West Spray Field Jefferson County Colorado

Statement of Basis and Purpose

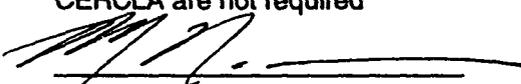
This decision document presents the selected remedial action/corrective action for the Rocky Flats Environmental Technology Site Operable Unit (OU) 11 West Spray Field located near Golden Colorado. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 the Colorado Hazardous Waste Act (CHWA) and to the extent practicable the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Resource Conservation Recovery Act (RCRA) is administered through the CHWA by the Colorado Department of Public Health and the Environment (CDPHE). OU 11 was investigated and a remedial alternative was selected in compliance with the Federal Facility Agreement and Consent Order Inter Agency Agreement (IAG) signed by the U S Department of Energy (DOE) the State of Colorado and the U S Environmental Protection Agency (EPA) on January 22 1991.

Description of the Selected Remedy

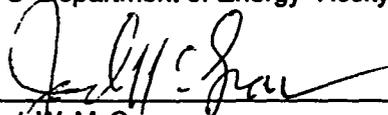
OU 11 West Spray Field is composed of one Individual Hazardous Substance Site (IHSS) IHSS 168. The preferred alternative for OU 11 consists of No Action. The No Action decision for OU 11 is based upon the NCP which provides for the selection of a No Action alternative when a site or OU is in a protective state i.e. poses no current or potential threat to human health or the environment. The risk evaluation performed in the RCRA Facilities Investigation/CERCLA Remedial Investigation (RFI/RI) Report determined that OU 11 was in a protective state.

Declaration Statement

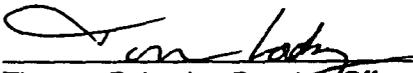
DOE has determined that no remedial action is necessary to be protective of human health and the environment at Rocky Flats Environmental Technology Site Operable Unit 11 West Spray Field. Because the remedy will not result in hazardous substances pollutants or contaminants remaining onsite above levels that allow for unlimited use and unrestricted exposure five-year reviews per Section 121 of CERCLA are not required.

  
Mark N Silverman Manager  
U S Department of Energy Rocky Flats Field Office

9/21/95  
Date

  
Jack W McGraw  
Deputy Regional Administrator Region VIII  
U S Environmental Protection Agency

9/5/95  
Date

  
Thomas P Looby Director Office Of Environment  
Colorado Department of Public Health and Environment

9/29/95  
Date

## PAC REFERENCE NUMBERS 117 3

IHSS Reference Number 117 3 Operable Unit 13  
Unit Name Chemical Storage South Site  
Approximate Location N749 500 E2 083 000

**DRAFT**

### Dates of Operation of Occurrence

Prior to 1965 1969

### Description of Operation or Occurrence

Various RFP photographs indicate that the area southwest of the intersection of Central Avenue and Sage Street was used for storage from approximately 1964 until 1969 Presently there are two #6 Fuel Oil tanks at the site They consist of an 800 000 gallon capacity tank, Tank 221 which was built in 1955 and a 1 800 000 gallon capacity tank Tank 224 which was built in 1973 Tank 221 is located west of Tank 224

Low level oblique RFP photographs show miscellaneous materials stored in the area around Tank 221 from at least 1965 to June 1969 Wooden boxes are evident south and east of Tank 221 in 1965 and 1966 It appears that drums were stored east of Tank 221 in 1966 In 1969 wooden boxes reportedly containing contaminated debris from the May 1969 fire in Building 776 and Building 777 are evident east of Tank 221 By 1969 the boxes were no longer stored in this area

On May 4 1995 a glovebox (H 22) which was being transferred from Building 776 to the south site chemical storage area, leaked highly contaminated oil along the last 400 feet of the route near the intersection of A and G roads which are now referred to as Central Avenue and 7th Street The glovebox which had been used for heat treating product material was considered excess contaminated property and was being removed for disposal Although the glovebox had been packaged in a plastic sheet lined wooden waste box the oil escaped from the box Approximately 2 to 3 liters of oil were released contaminating Central Avenue some ground at the storage area a fork lift a flatbed and a pick up box

The leaking oil affected a strip of pavement approximately 18 inches wide and approximately 900 square feet of earth The glovebox was placed on plastic sheeting at the corner of 7th Street and Central Avenue until removal

On June 15 1965 a leaking waste box was discovered in the waste storage area south of 51 The box was returned to Building 881 for investigation and repackaging It is likely that the area south of 51 was IHSS 117 3

### Physical/Chemical Description of Constituents Released

The oil released during May 1965 incident contained plutonium and was considered to be highly contaminated. Oil spots on the road were monitored by alpha survey instruments and had measurements of greater than 100 000 counts per minute.

No documentation was found regarding the constituents of the material leaking from the waste box in the June 1965 incident.

### Responses to Operation or Occurrence

The asphalt contaminated by the May 1965 incident was removed, placed in lined barrels and buried in a sludge pit. The soil affected by the leaking glovebox was also removed and drummed in preparation for offsite disposal. The removal of the soil under the glovebox was completed on May 7, 1965.

No documentation was found regarding cleanup following the June 1965 incident, but results of environmental investigations do not indicate levels of contamination requiring cleanup.

### Fate of Constituents Released to the Environment

Investigations were conducted in this area as part of the OU 13 RFI/RI. IHSS 152 (PAC Reference 152) was also included in this investigation and will be considered with IHSS 117.3 as a single source area due to their proximity. Fifty-five soil gas samples were collected at a depth of 5 feet and analyzed for VOCs. Data for this soil gas survey are reported in Table 2. Eleven surface soil samples were collected and analyzed for radionuclides and metals. Soil concentration results for this investigation are summarized in Table 1 and described in the *Draft OU 13 Data Summary No. 2 for the Operable Unit 13 100 Area* dated June 1995 (DOE 1995b).

The results of OU 13 sampling activities indicate future remedial action is not warranted. A comparison of the OU 13 results to the RFETS Programmatic Risk based Preliminary Remediation Goals (PPRGs) is presented in Table 1 (DOE 1995a). The Office Worker Scenario was selected for this comparison based on requirements defined in the RFETS Action Levels and Standards Framework for Surface Water, Ground Water, and Soils document for Tier II Surface Soils located in the Industrial Use Area (RFCA 1996). These data are below the Tier II action levels, indicating that the source area does not pose a threat to human health (carcinogenic risk of  $10^{-6}$  or a hazard quotient of 1).

### Action/No Action Recommendation

In accordance with the NFA decision criteria developed mutually by DOE, EPA, CDPHE, Kaiser Hill, and RMRS (RMRS 1996), any geographic area that passes the CDPHE conservative screen is a candidate for NFA. Passing the conservative screen requires a

carcinogenic and noncarcinogenic risk ratio sum of below 1 each. As seen in Table 3 the carcinogenic ratio sum is  $3.54 \times 10^{-1}$  and the noncarcinogenic ratio sum is  $2.38 \times 10^{-2}$ .

In cases where the ratio sum is less than 1 for a source area, the potential risk from dermal contact with soil is evaluated to ensure that cumulative risk, including dermal exposure, does not exceed a level of concern (ratio sum > 1) (see Table 4). The noncarcinogenic effects ratio sum for benzene, chloroform, vinyl chloride, cobalt, selenium, and zinc is  $2.36 \times 10^{-2}$ , while the carcinogenic ratio sum is  $3.74 \times 10^{-3}$ . The methodology used in calculating the dermal exposure ratio sum is explained in Appendix A.

Both Tables 3 and 4 indicate that the risk to human health from exposure to soil at IHSSs 1173 and 152 would be minimal based on the exposure assumptions for the residential scenario. The total carcinogenic ratio sum (dermal ratio + screen ratio) for this area is  $3.57 \times 10^{-1}$ , while the total noncarcinogenic ratio sum is  $4.74 \times 10^{-2}$ .

The NFA decision criteria document states that a geographic area that passes the CDPHE conservative screen must also undergo an Ecological Risk Assessment (ERA) screen before it can proceed through the NFA process (RMRS 1996). However, because this site is located in the industrial area, an ERA is not applicable for this area. Additionally, a review that was conducted for compliance with the National Environmental Policy Act did not identify any ecologically sensitive systems/species located in this area.

Based on the above evidence, the NFA criteria are met and no action is warranted for IHSS 1173 Chemical Storage (south site).

#### References

DOE 1992 *Historical Release Report for the Rocky Flats Plant* Rocky Flats Plant Golden CO June

DOE 1995a *Programmatic Risk based Preliminary Remediation Goals Final Revision 3* Rocky Flats Environmental Technology Site Golden CO August

DOE 1995b *Draft Data Summary 2 Operable Unit No. 13 100 Area* Rocky Flats Environmental Technology Site Golden CO June

DOE 1995c *Geochemical Characterization of Background Surface Soils Background Soils Characterization Program* Rocky Flats Environmental Technology Site Golden CO May 3

EPA 1992 *Air/Superfund National Technical Guidance Assessing Potential Indoor Air Impacts for Superfund Sites* Office of Air Quality EPA 451/R-92-002

EPA 1994 *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities* OSWER Directive No. 9355.4-12 Washington D.C. July 14

RFCA 1996 *Draft Rocky Flats Cleanup Agreement Attachment 5 Action Levels and Standards Framework for Surface Water Ground Water and Soils Rocky Flats Environmental Technology Site Golden CO*

RMRS 1996 *No Action/No Further Action/No Further Remedial Action (NFA) Decision Criteria for Rocky Flats Environmental Technology Site IN Rocky Flats Cleanup Agreement Public Comment Draft March 14 1996 Golden CO February*

γ

**Table 1 Chemicals of Concern Detected within IHSS 152  
and 117 3 Source Area**

Analytes	No of Samples Collected	No of Detections above Background <sup>1</sup>	Maximum Concentrations <sup>2</sup>	RFETS PPRGs for Surface Soil <sup>3</sup>
<b>Organics (mg/kg)<sup>4</sup></b>				
Benzene	55	2	0.616	1.97E+02
Chloroform	55	1	0.821	9.38E+02
Trichlorofluoromethane	55	9		
Vinyl Chloride	55	1	0.011	3.01E+00
<b>Metals (mg/kg)</b>				
Cobalt	11	1	53.5	1.23E+05
Lead <sup>5</sup>	11	2	90.6	
Selenium	11	1	1.5	1.02E+04
Zinc	11	7	1580	6.13E+05
<b>Radionuclides (pCi/g)</b>				
Pu 239/240	11	4	0.385	1.01E+01
U 233/234	11	2	2.261	7.08E+01
U 238	11	1	1.952	2.99E+00

( ) Information not available

<sup>1</sup>Site data were compared to the background mean plus two standard deviations background concentrations were found in *Geochemical Characterization of Background Surface Soils* (DOE 1995c)

<sup>2</sup>Source of data *Data Summary No. 2 Operable Unit No. 13 100 Area* (DOE 1995b)

<sup>3</sup>The programmatic preliminary remediation goals (PPRGs) used for comparison are for office worker exposure to surface soil (0 to 12 feet) at the 1E-6 risk level or hazard index of 1 (DOE 1995a)

<sup>4</sup>Volatile organic compounds were reported as soil gas results in mg/l and converted to mg/kg as shown in Table 2

<sup>5</sup>Although a PPRG has not been calculated for lead in soil the maximum lead concentration of 90.6 mg/kg is well below EPA's screening level of 400 mg/kg for residential soil (EPA 1994)

**Table 2 Conversion of Soil-gas Data to Soil Concentrations  
for IHSSs 152 and 117 3**

Analyte	No of Samples	No of Detects	Maximum Soil gas Concentration (mg/L) <sup>1</sup>	Henry's Constant (H) <sup>2</sup>	Koc (L/kg) <sup>2</sup>	Fraction of Organic Carbon (foc) <sup>2</sup>	Estimated Soil Concentration (mg/kg) <sup>3</sup>
Benzene	55	2	1.1	0.224	57	0.0022	0.616
Chloroform	55	1	1.1	0.165	56	0.0022	0.821
Trichlorofluoromethane	55	9	31	--	159	0.0022	--
Vinyl Chloride	55	1	1.6	3.45	11	0.0022	0.011

<sup>1</sup>Soil-gas survey results were reported in the OU 13 Data Summary (DOE 1995b) Data were collected from 5 foot depth

<sup>2</sup>H Koc and Foc used to calculate RFETS subsurface soil action levels

<sup>3</sup>Conversion equation were derived from formula for estimating soil-gas concentrations using soils concentrations in *Air/Superfund National Technical Guidance Assessing Potential Indoor Air Impacts for Superfund Sites* (EPA 1992)

Table 3 RBC<sup>1</sup> Screen for IHSSs 152 and 117 3 -- Soils 1 to 12 Feet

Analyte <sup>2</sup>	Maximum Concentration or Activity	Depth of Sample	Residential Soil RBCs		Ratio of Concentration to RBC	
			Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic
<b>Organics<sup>3</sup> (mg/kg)</b>						
Benzene	0.616	5 ft	2.21E+01		2.79E-02	
Chloroform	0.821	5 ft	1.05E+02	2.74E+03	7.82E-03	3.00E-04
Trichlorofluoromethane		5 ft				
Vinyl Chloride	0.011	5 ft	3.37E-01		3.26E-02	
<b>Metals (mg/kg)</b>						
Cobalt	53.5	0.2 cm		1.65E+04		3.24E-03
Selenium	1.5	0.2 cm		1.37E+03		1.09E-03
Lead <sup>4</sup>	90.6	0.2 cm				
Zinc	1580	0.2 cm		8.23E+04		1.92E-02
<b>Radionuclides<sup>5</sup> (pCi/g)</b>						
Plutonium 239/240	0.385	0.2 cm	2.51E+00		1.53E-01	
Uranium 233/234	2.261	0-2 cm	1.75E+01		1.29E-01	
Uranium 238	1.952	0-2 cm	7.47E+02		2.61E-03	
				<b>Ratio Sum</b>	<b>3.54E-01</b>	<b>2.38E-02</b>

<sup>1</sup> RBC = Risk based concentration chemical specific RBCs are from August 1995 Programmatic Risk based Preliminary Remediation Goals (DOE 1995a) The RBCs used in this conservative screen were based on a residential scenario for exposure to soil

<sup>2</sup> Only metals and radionuclides with concentrations or activities greater than background mean plus 2 standard deviations are listed

<sup>3</sup> VOC soil concentrations were derived from soil gas survey data (see Table 3) A concentration could not be calculated for trichlorofluoromethane because an H value was not available nor were PPRGs calculated

<sup>4</sup> Although no toxicity values exist for lead in soil the maximum lead concentration of 90.6 mg/kg is well below EPA's screening level of 400 mg/kg for residential soil (EPA 1994)

<sup>5</sup> For radionuclides listed with more than one isotope the more conservative RBC was used

Table 4 RBC Screen for IHSSs 152 and 117 3 -- Dermal Exposure

Analyte <sup>1</sup>	Maximum Concentration (mg/kg)	Oral Slope Factor <sup>2</sup>	Oral RfD <sup>2</sup>	Cancer Intake Factor <sup>3</sup>	Noncancer Intake Factor <sup>3</sup>	Residential Dermal RBCs (mg/kg) <sup>4</sup>		Ratio of Concentration to RBC	
						Cancer	Noncancer	Cancer	Noncancer
<b>Organics</b>									
Benzene	0.616	2.90E-02		8.54E-08		4.04E+02		1.53E-03	
Chloroform	0.821	6.10E-03	1.00E-02	8.54E-08	2.80E-07	1.92E+03	3.57E+04	4.28E-04	2.30E-05
Vinyl Chloride	0.011	1.90E+00		8.54E-08		6.16E+00		1.78E-03	
<b>Metals</b>									
Cobalt	53.5		6.00E-02		2.80E-08		1.65E+04		3.24E-03
Selenium	1.5		5.00E-03		2.80E-08		1.37E+03		1.09E-03
Zinc	1580		3.00E-01		2.80E-08		8.23E+04		1.92E-02
<b>Dermal Ratio Sum</b>								<b>3.74E-03</b>	<b>2.36E-02</b>
<b>Screen Ratio Sum</b>								<b>3.54E-01</b>	<b>2.38E-02</b>
<b>Total Ratio Sum</b>								<b>3.57E-01</b>	<b>4.74E-02</b>

<sup>1</sup> Radionuclides are not evaluated because dermal uptake is generally not an important route of uptake for radionuclides which have small dermal permeability constants (EPA 1989). Lead and trichlorofluoromethane were also not included (see Table 2).

<sup>2</sup> Units of slope factors are risk per mg chemical/kg body weight-day; units of reference dose (RfDs) are mg/chemical/kg body weight-day (DOE 1995a). Oral toxicity criteria were not adjusted for absorption or other corrections applicable to dermal contact.

<sup>3</sup> Intakes were calculated using assumptions and equation shown in text. Units are kg soil/kg body weight-day.

<sup>4</sup> Carcinogenic RBC = target risk/(intake factor x slope factor); noncarcinogenic RBC = (target hazard index x RfD)/intake factor.

35

## Appendix A Dermal Exposure Evaluation

In cases where the ratio sum is less than 1 for a source area the potential risk from dermal contact with soil is evaluated to ensure that cumulative risk including dermal exposure would not exceed a level of concern (ratio sum > 1) For IHSSs 152 and 117 3 risk based concentrations (RBCs) for dermal contact with soil were calculated assuming residential exposure The RBCs for carcinogens were calculated assuming residential exposure The RBCs for carcinogens were calculated assuming a target excess lifetime cancer risk of  $10^{-6}$  exposed skin surface area (SA) of 2 910 cm<sup>2</sup> (approximately equivalent to hands face and forearms) absorption factors (AB) of 0 001 for metals and 0 01 for organics a soil adherence factor of 0 5mg/cm<sup>2</sup> an exposure frequency (EF) of 350 days/year exposure duration (ED) of 30 years body weight of 70 kg an averaging time (AT) of 25 550 days (70 years) and a unit conversion factor (CF) of  $10^{-6}$  kg/mg In calculating RBCs for noncarcinogenic effects all of the exposure parameters are the same except the averaging time is 10 950 days (30 years) and the target hazard index of 1 replaces the target excess lifetime cancer risk The intake factor (IF) equation for dermal contact is

$$IF = \frac{(SA)(AB)(AF)(EF)(ED)(CF)}{(BW)(AT)}$$

If the carcinogenic and noncarcinogenic total ratios for dermal contact with chemicals in soil are less than 1 and when added to the ratios for other soil exposures do not result in a ratio sum greater than 1 the source area is a candidate for no further action pending an ARARs review If either the carcinogenic or noncarcinogenic ratio for dermal contact to chemicals in soil or sediment is greater than 1 or when added to the ratios for other soil or sediment exposures result in a ratio sum greater than 1 the source area will be retained for further evaluation

Dermal absorption of radionuclides is not quantified because dermal uptake is generally not an important route of uptake for radionuclides which have small dermal permeability constants (EPA 1989)

### Reference

EPA 1989 *Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)* EPA/540/1 89/002 December

**PAC REFERENCE NUMBER 800 178**

IHSS Reference Number 178 Operable Unit 15  
Unit Name Building 881 Drum Storage Area  
Approximate Location N748 000 E2 083 000

**DRAFT**

Date(s) of Operation or Occurrence

1953 Present

Description of Operation or Occurrence

This Building 881 Drum Storage Area was first used in 1953 when Building 881 operations began and was used as a RCRA 90-day accumulation area. The storage area is located in Room 165 and measures 5 feet by 5 feet. The maximum number of 55 gallon drums stored there was five. They are stored directly on the floor with no berms around the drums (DOE 1992 1995a)

Physical/Chemical Description of Constituents Released

The drums stored in the IHSS contained wastes solvents (volatile organic compounds) and possibly low level radioactive waste. There have been no documented releases or visual evidence of a release (DOE 1992 1995a)

Response to Operation or Occurrence

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 IAG. Thirty radiological smear samples were collected from the IHSS and three hot water rinse samples were obtained from the IHSS perimeter and pathway areas. Final radiological surveys at each of the 30 initial smear sample locations were performed.

Fate of Constituents Released to the Environment

No RCRA regulated constituents of regulatory concern were identified in the IHSS sampling. Also, 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 poses no unacceptable risk to workers.

### Action/No Action Recommendation

Because IHSS 178 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 178 (DOE 1995b) The CAD/ROD received final approval on October 18 1995 (see attached declaration)

### Comments

None

### References

DOE 1992 *Historical Release Report for the Rocky Flats Plant* Rocky Flats Plant  
Golden CO

DOE 1995a *Phase I RFI/RI Report for Operable Unit 15 Inside Building Closures*  
RFP/ERM 94 00035 Rocky Flats Environmental Technology Site Golden CO January

DOE 1995b *Corrective Action Decision/Record of Decision for OU15 Inside Building Closures* Rocky Flats Environmental Technology Site Golden CO August

**CORRECTIVE ACTION DECISION/  
RECORD OF DECISION DECLARATION**

Site Name and Location

Rocky Flats Environmental Technology Site (Rocky Flats) Operable Unit 15 Inside Building Closures  
Golden Jefferson County Colorado

Statement of Basis and Purpose

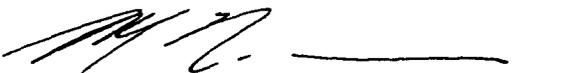
This decision document presents the selected remedial action/corrective action for the Rocky Flats Operable Unit (OU) 15 Inside Building Closures. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, the Colorado Hazardous Waste Act (CHWA) and to the extent practicable the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Resource Conservation Recovery Act (RCRA) is administered through the CHWA by the Colorado Department of Public Health and the Environment (CDPHE). OU15 was investigated and a Preferred Alternative was selected in compliance with the Federal Facility Agreement and Consent Order Inter Agency Agreement (IAG) signed by the U.S. Department of Energy (DOE), the State of Colorado and the U.S. Environmental Protection Agency (EPA) on January 22, 1991.

Description of the Selected Remedies

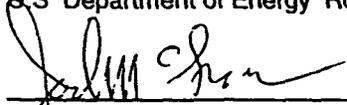
OU15 Inside Building Closures is composed of six Individual Hazardous Substance Sites (IHSSs). The preferred alternative for OU15 consists of the following actions: 1) Clean Closure under RCRA for all six of the OU15 IHSSs; 2) a No Action CERCLA decision for IHSSs 178, 211, and 217; and 3) a deferral of any CERCLA actions at IHSSs 179, 180, and 204 until final disposition of their respective buildings. RCRA closure certification for the six IHSSs, signed by an independent registered professional engineer, has been approved by CDPHE. The No Action CERCLA decision for IHSSs 178, 211, and 217 is based upon the NCP, which provides for the selection of a No Action alternative when a site or OU is already in a protective state. OU15 IHSSs 179, 180, and 204 will be closed as IAG IHSSs and any future CERCLA action decisions will be made based upon the ultimate disposition of the buildings, inclusive of the physical areas previously described as OU15 IHSSs. Evaluation of remedial alternatives and closure activities included waste minimization considerations.

Declaration Statement

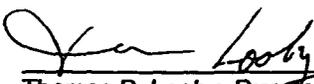
DOE has determined that no remedial action is necessary to be protective of human health and the environment at IHSSs 178, 211, and 217 because they meet the clean closure requirements of the Rocky Flats RCRA Permit (RFRP) and the Federal occupational radiation protection standards. At IHSSs 179, 180, and 204, no remedial action is currently necessary because they meet the clean closure requirements of the RFRP and the Rocky Flats radiological control program is in compliance with Applicable or Relevant and Appropriate Requirements (ARARs)/To Be Considered (TBC) criteria and other identified protective standards. Future CERCLA actions may be required at the time of ultimate disposition of the buildings. Because the remedy will not result in hazardous substances remaining onsite above ARARs, TBCs, or protective standards, a five-year review is not required.

  
\_\_\_\_\_  
Mark N. Silverman, Manager  
U.S. Department of Energy, Rocky Flats Field Office

9/21/95  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Jack W. McGraw  
Deputy Regional Administrator, Region VIII  
U.S. Environmental Protection Agency

10/18/95  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Thomas P. Looby, Director, Office of Environment  
Colorado Department of Public Health and Environment

9/29/95  
\_\_\_\_\_  
Date

**PAC REFERENCE NUMBER 800 179**

IHSS Reference Number 179 Operable Unit 15  
Unit Name Building 865 Drum Storage Area  
Approximate Location N749 000 E2 084 000

**DRAFT**

Date(s) of Operation or Occurrence

1970 through 1995

Description of Operation or Occurrence

This Building 865 Drum Storage Area was first used in 1970 as a RCRA 90-day accumulation area. The storage area was located in Room 145 and measured 12 feet by 8 feet. The maximum number of 55 gallon drums stored there was 10. They were stored directly on the floor with no berms around the drums and no floor drains (DOE 1992 1995a)

Physical/Chemical Description of Constituents Released

The drums stored in the IHSS contained oils, chlorinated solvents, low level radioactive waste, and possibly beryllium. There were no documented releases or visual evidence of a release (DOE 1992 1995a)

Response to Operation or Occurrence

Although no documentation was found to indicate a release to the environment, IHSS 179 was studied as part of OU 15 Inside Building Closures (DOE 1995a) in accordance with the IAG. Twenty three radiological and beryllium smear samples were collected from the IHSS and three hot water rinse samples were obtained from the IHSS perimeter and pathway areas. Final radiological surveys were performed at each of the 23 initial smear sample locations.

Fate of Constituents Released to the Environment

No RCRA regulated constituents of regulatory concern were identified in the IHSS sampling. Also, none of the data collected during the CERCLA evaluation with respect to radionuclides and beryllium exceeded the screening criteria. IHSS 179 met the federal occupational radiation protection standards and poses no unacceptable risk to workers. In addition, IHSS 179 is located within radiological control areas and is subject to the procedures that are a part of the Rocky Flats Radiological Control Program in compliance

with the protective standards for radionuclides. The Rocky Flats Radiological Control Program will assure that no contaminants are released from the buildings. Therefore this IHSS poses no risk to human, plant, and animal populations outside of the building.

#### Action/No Action Recommendation

Because IHSS 179 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 a deferral of any action for this physical location until final disposition of this building (DOE 1995b). Although IHSS 179 will be closed with respect to CERCLA, it is within a radiological control area at Rocky Flats, and action at this physical area is deferred until final disposition of the building in which it is located. Any future CERCLA action decisions will be made based upon the ultimate disposition of the building. The CAD/ROD received final approval on October 18, 1995 (see attached declaration).

#### Comments

None

#### References

DOE 1992 *Historical Release Report for the Rocky Flats Plant* Rocky Flats Plant  
Golden, CO

DOE 1995a *Phase I RFI/RI Report for Operable Unit 15 Inside Building Closures*  
RFP/ERM 94-00035 Rocky Flats Environmental Technology Site Golden, CO January

DOE 1995b *Corrective Action Decision/Record of Decision for OU15 Inside Building Closures* Rocky Flats Environmental Technology Site Golden, CO August

**CORRECTIVE ACTION DECISION/  
RECORD OF DECISION DECLARATION**

Site Name and Location

Rocky Flats Environmental Technology Site (Rocky Flats) Operable Unit 15 Inside Building Closures  
Golden Jefferson County Colorado

Statement of Basis and Purpose

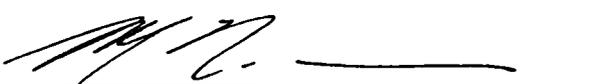
This decision document presents the selected remedial action/corrective action for the Rocky Flats Operable Unit (OU) 15 Inside Building Closures. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, the Colorado Hazardous Waste Act (CHWA) and to the extent practicable the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Resource Conservation Recovery Act (RCRA) is administered through the CHWA by the Colorado Department of Public Health and the Environment (CDPHE). OU15 was investigated and a Preferred Alternative was selected in compliance with the Federal Facility Agreement and Consent Order Inter Agency Agreement (IAG) signed by the U.S. Department of Energy (DOE), the State of Colorado, and the U.S. Environmental Protection Agency (EPA) on January 22, 1991.

Description of the Selected Remedies

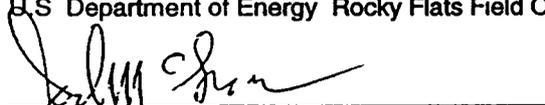
OU15 Inside Building Closures is composed of six Individual Hazardous Substance Sites (IHSSs). The preferred alternative for OU15 consists of the following actions: 1) Clean Closure under RCRA for all six of the OU15 IHSSs; 2) a No Action CERCLA decision for IHSSs 178, 211, and 217; and 3) a deferral of any CERCLA actions at IHSSs 179, 180, and 204 until final disposition of their respective buildings. RCRA closure certification for the six IHSSs, signed by an independent registered professional engineer, has been approved by CDPHE. The No Action CERCLA decision for IHSSs 178, 211, and 217 is based upon the NCP, which provides for the selection of a No Action alternative when a site or OU is already in a protective state. OU15 IHSSs 179, 180, and 204 will be closed as IAG IHSSs and any future CERCLA action decisions will be made based upon the ultimate disposition of the buildings, inclusive of the physical areas previously described as OU15 IHSSs. Evaluation of remedial alternatives and closure activities included waste minimization considerations.

Declaration Statement

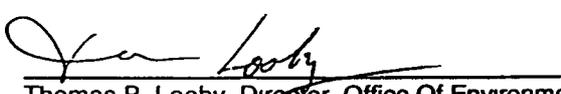
DOE has determined that no remedial action is necessary to be protective of human health and the environment at IHSSs 178, 211, and 217 because they meet the clean closure requirements of the Rocky Flats RCRA Permit (RFRP) and the Federal occupational radiation protection standards. At IHSSs 179, 180, and 204, no remedial action is currently necessary because they meet the clean closure requirements of the RFRP and the Rocky Flats radiological control program is in compliance with Applicable or Relevant and Appropriate Requirements (ARARs)/To Be Considered (TBC) criteria and other identified protective standards. Future CERCLA actions may be required at the time of ultimate disposition of the buildings. Because the remedy will not result in hazardous substances remaining onsite above ARARs, TBCs, or protective standards, a five-year review is not required.

  
Mark N. Silverman, Manager  
U.S. Department of Energy, Rocky Flats Field Office

9/21/95  
Date

  
Jack W. McGraw  
Deputy Regional Administrator, Region VIII  
U.S. Environmental Protection Agency

10/18/95  
Date

  
Thomas P. Looby, Director, Office of Environment  
Colorado Department of Public Health and Environment

9/29/95  
Date

**PAC REFERENCE NUMBER 800 180**

IHSS Reference Number 180 Operable Unit 15  
Unit Name Building 883 Drum Storage Area  
Approximate Location N748 500 E2 084 000

**DRAFT**

Date(s) of Operation or Occurrence

1981 1995

Description of Operation or Occurrence

This Building 883 Drum Storage Area was first used in 1981 as a RCRA 90-day accumulation area. The storage area was located in Room 104 which measures 16 feet by 10 feet. The maximum number of 55 gallon drums stored there was 30. They were stored directly on the floor with no berms around the drums and no floor drains (DOE 1992 1995a)

Physical/Chemical Description of Constituents Released

The drums stored in the IHSS contained oils contaminated with solvents uranium and beryllium. There have been no documented releases or visual evidence of a release (DOE 1992 1995a)

Response to Operation or Occurrence

Although no documentation was found to indicate a release to the environment IHSS 180 was studied as part of OU 15 Inside Building Closures (DOE 1995a) in accordance with the IAG. Forty nine radiological and beryllium smear samples were collected from the IHSS and four hot water rinsate samples were obtained from the IHSS perimeter and pathway areas. Final radiological surveys at each of the 49 initial smear sample locations were performed.

Fate of Constituents Released to the Environment

No RCRA regulated constituents of regulatory concern were identified in the IHSS sampling. The data collected during the CERCLA evaluation did not yield detections of radionuclides above the permissible levels in the hot water rinsate samples and none of the post rinsate smear samples exhibited total alpha or beta activity exceeding the permissible levels. However seven of the sampling areas surveyed for beta dose rate exceeded the established screening criteria limit of 2.5 mrem/hr. An evaluation based on occupational

exposure showed total effective dose equivalents below 5 rem/yr. In addition, IHSS 180 is located within a radiological control area and subject to the procedures which are a part of the Rocky Flats Radiological Control Program in compliance with the protective standards for radionuclides. The Rocky Flats Radiological Control Program will assure that no contaminants are released from the buildings. Therefore, this IHSS poses no risk to human, plant, and animal populations outside of the building.

#### Action/No Action Recommendation

Because IHSS 180 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 a deferral of any action for this physical location until final disposition of this building (DOE 1995b). Although IHSS 180 will be closed with respect to RCRA and CERCLA, it is within a radiological control area at Rocky Flats and action at this physical area is deferred until final disposition of the building in which it is located. Any future CERCLA action decisions will be made based upon the ultimate disposition of the building. The CAD/ROD received final approval on October 18, 1995 (see attached declaration).

#### Comments

None

#### References

DOE 1992 *Historical Release Report for the Rocky Flats Plant* Rocky Flats Plant  
Golden, CO

DOE 1995a *Phase I RFI/RI Report for Operable Unit 15 Inside Building Closures*  
RFP/ERM 94 00035 Rocky Flats Environmental Technology Site Golden, CO January

DOE 1995b *Corrective Action Decision/Record of Decision for OU15 Inside Building Closures* Rocky Flats Environmental Technology Site Golden, CO August

**CORRECTIVE ACTION DECISION/  
RECORD OF DECISION DECLARATION**

Site Name and Location

Rocky Flats Environmental Technology Site (Rocky Flats) Operable Unit 15 Inside Building Closures  
Golden Jefferson County Colorado

Statement of Basis and Purpose

This decision document presents the selected remedial action/corrective action for the Rocky Flats Operable Unit (OU) 15 Inside Building Closures. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 the Colorado Hazardous Waste Act (CHWA) and to the extent practicable the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Resource Conservation Recovery Act (RCRA) is administered through the CHWA by the Colorado Department of Public Health and the Environment (CDPHE). OU15 was investigated and a Preferred Alternative was selected in compliance with the Federal Facility Agreement and Consent Order Inter Agency Agreement (IAG) signed by the U.S. Department of Energy (DOE) the State of Colorado and the U.S. Environmental Protection Agency (EPA) on January 22 1991.

Description of the Selected Remedies

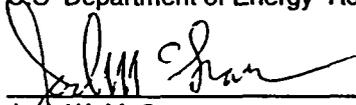
OU15 Inside Building Closures is composed of six Individual Hazardous Substance Sites (IHSSs). The preferred alternative for OU15 consists of the following actions: 1) Clean Closure under RCRA for all six of the OU15 IHSSs; 2) a No Action CERCLA decision for IHSSs 178 211 and 217; and 3) a deferral of any CERCLA actions at IHSSs 179 180 and 204 until final disposition of their respective buildings. RCRA closure certification for the six IHSSs signed by an independent registered professional engineer has been approved by CDPHE. The No Action CERCLA decision for IHSSs 178 211 and 217 is based upon the NCP which provides for the selection of a No Action alternative when a site or OU is already in a protective state. OU15 IHSSs 179 180 and 204 will be closed as IAG IHSSs and any future CERCLA action decisions will be made based upon the ultimate disposition of the buildings inclusive of the physical areas previously described as OU15 IHSSs. Evaluation of remedial alternatives and closure activities included waste minimization considerations.

Declaration Statement

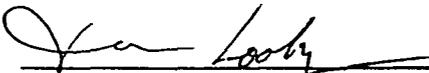
DOE has determined that no remedial action is necessary to be protective of human health and the environment at IHSSs 178 211 and 217 because they meet the clean closure requirements of the Rocky Flats RCRA Permit (RFRP) and the Federal occupational radiation protection standards. At IHSSs 179 180 and 204 no remedial action is currently necessary because they meet the clean closure requirements of the RFRP and the Rocky Flats radiological control program is in compliance with Applicable or Relevant and Appropriate Requirements (ARARs)/To Be Considered (TBC) criteria and other identified protective standards. Future CERCLA actions may be required at the time of ultimate disposition of the buildings. Because the remedy will not result in hazardous substances remaining onsite above ARARs TBCs or protective standards a five-year review is not required.

  
\_\_\_\_\_  
Mark N Silverman Manager  
U.S. Department of Energy Rocky Flats Field Office

9/21/95  
Date

  
\_\_\_\_\_  
Jack W McGraw  
Deputy Regional Administrator Region VIII  
U.S. Environmental Protection Agency

10/18/95  
Date

  
\_\_\_\_\_  
Thomas P Looby Director Office Of Environment  
Colorado Department of Public Health and Environment

9/29/95  
Date

**PAC REFERENCE NUMBER 400-204**

IHSS Reference Number 204 Operable Unit 15

Unit Name Original Uranium Chip Roaster (RCRA Unit 45)

Approximate Location N748 550 E2 082 050

Date(s) of Operation or Occurrence

1956 through 1988

**DRAFT**

Description of Operation or Occurrence

IHSS 204 the Original Uranium Chip Roaster was used historically to oxidize uranium chips coated with small amounts of oils and coolants converting the elemental uranium to uranium oxide. The unit is cylindrical with a diameter of 5 feet 6 inches and a height of 7 feet 4 inches. The inlet for the unit is located in Room 502 of Building 447 and the outlet is located directly downstairs in Room 32. No hazardous constituents have been treated in this unit since January 1988 when the uranium chips processed in the unit ceased to be coated with oils and coolants.

An incident involving the roaster occurred in Room 32 of Building 447 on June 28, 1985. An operator had filled a barrel with hot oxide and in replacing it with a new barrel placed the thermally hot barrel next to some cardboard. About 3 hours later the cardboard burst into flames setting off the sprinklers and fire alarm. The basement of the building flooded (DOE 1991).

Physical/Chemical Description of Constituents Released

The roaster was used for the thermal treatment of hazardous waste consisting of depleted uranium chips coated with oil and coolant (freon TF and 1,1,1 trichloroethane). A fire on June 28, 1985 involved burning cardboard (DOE 1992, 1995a).

Response to Operation or Occurrence

IHSS 204 was studied as part of OU 15 Inside Building Closures (DOE 1995a) in accordance with the IAG. A total of 77 radiological smear samples were collected from the IHSS (Rooms 31, 32, 501, and 502 chip roaster and wash rack/drum washing basin in Room 501). Seven hot water rinse samples were obtained from the IHSS.

## Fate of Constituents Released to the Environment

No RCRA regulated constituents of regulatory concern were identified in the IHSS sampling. No radionuclides detected in the hot water rinsate samples from IHSS 204 had activities exceeding the permissible radionuclide levels. The prerinsate smear samples from the floor surfaces in Rooms 32 and 502 and the outside surfaces of the Chip Roaster inlet and outlet confirmed the presence of radiological contamination at IHSS 204. Rooms 32 and 502 are posted and managed as radiological control areas and are subject to the procedures which are a part of the Rocky Flats Radiological Control Program in compliance with the protective standards for radionuclides. The Rocky Flats Radiological Control Program will assure that no contaminants are released from the building. Therefore, this IHSS poses no risk to human, plant, and animal populations outside of the building.

## Action/No Action Recommendation

Because IHSS 204 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 a deferral of any action for this IHSS until final disposition of this building (DOE 1995b). Although IHSS 204 will be closed with respect to RCRA and CERCLA, it is within a radiological control area at Rocky Flats and action at this physical area is deferred until final disposition of the building in which it is located. Any future CERCLA action decisions will be made based upon the ultimate disposition of the building. The CAD/ROD received final approval on October 18, 1995 (see attached declaration).

## Comments

None

## References

DOE 1992 *Historical Release Report for the Rocky Flats Plant* Rocky Flats Plant Golden, CO

DOE 1995a *Phase I RFI/RI Report for Operable Unit 15 Inside Building Closures* RFP/ERM 94 00035 Rocky Flats Environmental Technology Site Golden, CO January

DOE 1995b *Corrective Action Decision/Record of Decision for OU15 Inside Building Closures* Rocky Flats Environmental Technology Site Golden, CO August

**CORRECTIVE ACTION DECISION/  
RECORD OF DECISION DECLARATION**

Site Name and Location

Rocky Flats Environmental Technology Site (Rocky Flats) Operable Unit 15 Inside Building Closures  
Golden Jefferson County Colorado

Statement of Basis and Purpose

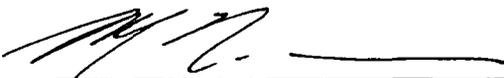
This decision document presents the selected remedial action/corrective action for the Rocky Flats Operable Unit (OU) 15 Inside Building Closures. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, the Colorado Hazardous Waste Act (CHWA) and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Resource Conservation Recovery Act (RCRA) is administered through the CHWA by the Colorado Department of Public Health and the Environment (CDPHE). OU15 was investigated and a Preferred Alternative was selected in compliance with the Federal Facility Agreement and Consent Order Inter-Agency Agreement (IAG) signed by the U.S. Department of Energy (DOE), the State of Colorado, and the U.S. Environmental Protection Agency (EPA) on January 22, 1991.

Description of the Selected Remedies

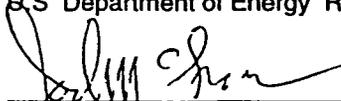
OU15 Inside Building Closures is composed of six Individual Hazardous Substance Sites (IHSSs). The preferred alternative for OU15 consists of the following actions: 1) Clean Closure under RCRA for all six of the OU15 IHSSs; 2) a No Action CERCLA decision for IHSSs 178, 211, and 217; and 3) a deferral of any CERCLA actions at IHSSs 179, 180, and 204 until final disposition of their respective buildings. RCRA closure certification for the six IHSSs, signed by an independent registered professional engineer, has been approved by CDPHE. The No Action CERCLA decision for IHSSs 178, 211, and 217 is based upon the NCP, which provides for the selection of a No Action alternative when a site or OU is already in a protective state. OU15 IHSSs 179, 180, and 204 will be closed as IAG IHSSs and any future CERCLA action decisions will be made based upon the ultimate disposition of the buildings, inclusive of the physical areas previously described as OU15 IHSSs. Evaluation of remedial alternatives and closure activities included waste minimization considerations.

Declaration Statement

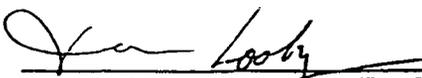
DOE has determined that no remedial action is necessary to be protective of human health and the environment at IHSSs 178, 211, and 217 because they meet the clean closure requirements of the Rocky Flats RCRA Permit (RFRP) and the Federal occupational radiation protection standards. At IHSSs 179, 180, and 204, no remedial action is currently necessary because they meet the clean closure requirements of the RFRP and the Rocky Flats radiological control program is in compliance with Applicable or Relevant and Appropriate Requirements (ARARs)/To Be Considered (TBC) criteria and other identified protective standards. Future CERCLA actions may be required at the time of ultimate disposition of the buildings. Because the remedy will not result in hazardous substances remaining onsite above ARARs/TBCs or protective standards, a five-year review is not required.

  
\_\_\_\_\_  
Mark N Silverman Manager  
U.S. Department of Energy Rocky Flats Field Office

9/21/95  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Jack W McGraw  
Deputy Regional Administrator Region VIII  
U.S. Environmental Protection Agency

10/18/95  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Thomas P Looby Director Office Of Environment  
Colorado Department of Public Health and Environment

9/29/95  
\_\_\_\_\_  
Date

48

**PAC REFERENCE NUMBER 800 211**

IHSS Reference Number 211 Operable Unit 15

Unit Name Building 881 Drum Storage Area Unit 26

Approximate Location N748 000 E2 084 000

Date(s) of Operation or Occurrence

1981 Present

**DRAFT**

Description of Operation or Occurrence

This Building 881 Drum Storage Area was first used in 1981 and is currently used as a RCRA 90-day accumulation area. The storage area is located in Room 266B and measures 20 feet by 10 feet. The maximum number of 55 gallon drums stored there is 29 (DOE 1992 1995a)

Physical/Chemical Description of Constituents Released

The wastes stored in the IHSS have historically included low level radioactive combustibles (e.g. 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)

Response to Operation or Occurrence

Although no documentation was found to indicate a release to the environment, IHSS 211 was studied as part of OU 15 Inside Building Closures (DOE 1995a) in accordance with the IAG. Thirty two radiological smear samples were collected from the IHSS and three hot water rinse samples were obtained from the IHSS perimeter and pathway areas. Final radiological surveys were performed at each of the 32 initial smear sample locations.

Fate of Constituents Released to the Environment

No RCRA regulated constituents of regulatory concern were identified in the IHSS sampling. Also, none of the data collected during the CERCLA evaluation with respect to radionuclides exceeded the screening criteria. IHSS 211 met the federal occupational radiation protection standards and poses no unacceptable risk to workers.

Action/No Action Recommendation

Because IHSS 211 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 this physical area (DOE 1995b) The CAD/ROD received final approval on October 18 1995 (see attached declaration)

Comments

None

References

DOE 1992 *Historical Release Report for the Rocky Flats Plant* Rocky Flats Plant Golden CO

DOE 1995a *Phase I RFI/RI Report for Operable Unit 15 Inside Building Closures* RFP/ERM 94-00035 Rocky Flats Environmental Technology Site Golden CO January

DOE 1995b *Corrective Action Decision/Record of Decision for OU15 Inside Building Closures* Rocky Flats Environmental Technology Site Golden CO August

**CORRECTIVE ACTION DECISION/  
RECORD OF DECISION DECLARATION**

Site Name and Location

Rocky Flats Environmental Technology Site (Rocky Flats) Operable Unit 15 Inside Building Closures  
Golden Jefferson County Colorado

Statement of Basis and Purpose

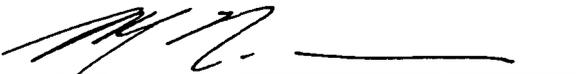
This decision document presents the selected remedial action/corrective action for the Rocky Flats Operable Unit (OU) 15 Inside Building Closures. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, the Colorado Hazardous Waste Act (CHWA) and to the extent practicable the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Resource Conservation Recovery Act (RCRA) is administered through the CHWA by the Colorado Department of Public Health and the Environment (CDPHE). OU15 was investigated and a Preferred Alternative was selected in compliance with the Federal Facility Agreement and Consent Order Inter-Agency Agreement (IAG) signed by the U.S. Department of Energy (DOE), the State of Colorado, and the U.S. Environmental Protection Agency (EPA) on January 22, 1991.

Description of the Selected Remedies

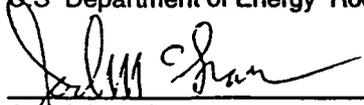
OU15 Inside Building Closures is composed of six Individual Hazardous Substance Sites (IHSSs). The preferred alternative for OU15 consists of the following actions: 1) Clean Closure under RCRA for all six of the OU15 IHSSs; 2) a No Action CERCLA decision for IHSSs 178, 211, and 217; and 3) a deferral of any CERCLA actions at IHSSs 179, 180, and 204 until final disposition of their respective buildings. RCRA closure certification for the six IHSSs, signed by an independent registered professional engineer, has been approved by CDPHE. The No Action CERCLA decision for IHSSs 178, 211, and 217 is based upon the NCP, which provides for the selection of a No Action alternative when a site or OU is already in a protective state. OU15 IHSSs 179, 180, and 204 will be closed as IAG IHSSs and any future CERCLA action decisions will be made based upon the ultimate disposition of the buildings, inclusive of the physical areas previously described as OU15 IHSSs. Evaluation of remedial alternatives and closure activities included waste minimization considerations.

Declaration Statement

DOE has determined that no remedial action is necessary to be protective of human health and the environment at IHSSs 178, 211, and 217 because they meet the clean closure requirements of the Rocky Flats RCRA Permit (RFRP) and the Federal occupational radiation protection standards. At IHSSs 179, 180, and 204, no remedial action is currently necessary because they meet the clean closure requirements of the RFRP and the Rocky Flats radiological control program is in compliance with Applicable or Relevant and Appropriate Requirements (ARARs)/To Be Considered (TBC) criteria and other identified protective standards. Future CERCLA actions may be required at the time of ultimate disposition of the buildings. Because the remedy will not result in hazardous substances remaining onsite above ARARs, TBCs, or protective standards, a five-year review is not required.

  
\_\_\_\_\_  
Mark N. Silverman, Manager  
U.S. Department of Energy, Rocky Flats Field Office

9/21/95  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Jack W. McGraw  
Deputy Regional Administrator, Region VIII  
U.S. Environmental Protection Agency

10/18/95  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Thomas P. Looby, Director, Office of Environment  
Colorado Department of Public Health and Environment

9/29/95  
\_\_\_\_\_  
Date

## PAC REFERENCE NUMBER 800 217

IHSS Reference Number 217 Operable Unit 15

Unit Name Building 881 Cyanide Bench Scale Treatment Unit 32

Approximate Location N748 000 E2 084 000

### Date(s) of Operation or Occurrence

1986 through September 1988

**DRAFT**

### Description of Operation or Occurrence

IHSS 217 was a hazardous waste treatment unit located in Room 131C in Building 881. IHSS 217 consisted of a 4 foot by 5 foot 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 about 2 months to fill. The contents of the bottles were reacted with sodium or calcium hypochlorite to oxidize the cyanide to cyanate. Once neutralization was complete the contents of the bottle were poured down the process waste drain for transport to Building 374 for further treatment (DOE 1992 1995a).

### Physical/Chemical Description of Constituents Released

The wastes involved laboratory waste containing cyanide. There have been no documented releases or visual evidence of a release (DOE 1992 1995a).

### Response to Operation or Occurrence

Although no documentation was found to indicate a release to the environment IHSS 217 was studied as part of OU 15 Inside Building Closures (DOE 1995a) in accordance with the IAG. Thirteen radiological smear samples were collected from the IHSS and one hot water rinsate sample was obtained from the IHSS. Final radiological surveys were performed at each of the 13 initial smear sample locations.

### Fate of Constituents Released to the Environment

No RCRA regulated constituents of regulatory concern were identified in the IHSS verification sampling. Also none of the data collected during the CERCLA evaluation with respect to radionuclides exceeded the screening criteria. IHSS 217 met the federal occupational radiation protection standards and poses no unacceptable risk to workers.

Action/No 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 this IHSS (DOE 1995b) The CAD/ROD received final approval on October 18 1995 (see attached declaration)

Comments

None

References

DOE 1992 *Historical Release Report for the Rocky Flats Plant* Rocky Flats Plant  
Golden CO

DOE 1995a *Phase I RFI/RI Report for Operable Unit 15 Inside Building Closures*  
RFP/ERM 94 00035 Rocky Flats Environmental Technology Site Golden CO January

DOE 1995b *Corrective Action Decision/Record of Decision for OU15 Inside Building Closures* Rocky Flats Environmental Technology Site Golden CO August

**CORRECTIVE ACTION DECISION/  
RECORD OF DECISION DECLARATION**

Site Name and Location

Rocky Flats Environmental Technology Site (Rocky Flats) Operable Unit 15 Inside Building Closures  
Golden Jefferson County Colorado

Statement of Basis and Purpose

This decision document presents the selected remedial action/corrective action for the Rocky Flats Operable Unit (OU) 15 Inside Building Closures. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, the Colorado Hazardous Waste Act (CHWA) and to the extent practicable the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Resource Conservation Recovery Act (RCRA) is administered through the CHWA by the Colorado Department of Public Health and the Environment (CDPHE). OU15 was investigated and a Preferred Alternative was selected in compliance with the Federal Facility Agreement and Consent Order Inter Agency Agreement (IAG) signed by the U.S. Department of Energy (DOE), the State of Colorado, and the U.S. Environmental Protection Agency (EPA) on January 22, 1991.

Description of the Selected Remedies

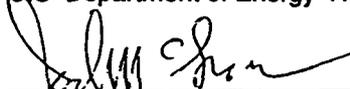
OU15 Inside Building Closures is composed of six Individual Hazardous Substance Sites (IHSSs). The preferred alternative for OU15 consists of the following actions: 1) Clean Closure under RCRA for all six of the OU15 IHSSs; 2) a No Action CERCLA decision for IHSSs 178, 211, and 217; and 3) a deferral of any CERCLA actions at IHSSs 179, 180, and 204 until final disposition of their respective buildings. RCRA closure certification for the six IHSSs, signed by an independent registered professional engineer, has been approved by CDPHE. The No Action CERCLA decision for IHSSs 178, 211, and 217 is based upon the NCP, which provides for the selection of a No Action alternative when a site or OU is already in a protective state. OU15 IHSSs 179, 180, and 204 will be closed as IAG IHSSs and any future CERCLA action decisions will be made based upon the ultimate disposition of the buildings, inclusive of the physical areas previously described as OU15 IHSSs. Evaluation of remedial alternatives and closure activities included waste minimization considerations.

Declaration Statement

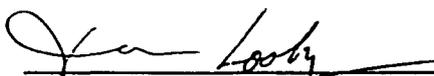
DOE has determined that no remedial action is necessary to be protective of human health and the environment at IHSSs 178, 211, and 217 because they meet the clean closure requirements of the Rocky Flats RCRA Permit (RFRP) and the Federal occupational radiation protection standards. At IHSSs 179, 180, and 204, no remedial action is currently necessary because they meet the clean closure requirements of the RFRP and the Rocky Flats radiological control program is in compliance with Applicable or Relevant and Appropriate Requirements (ARARs)/To Be Considered (TBC) criteria and other identified protective standards. Future CERCLA actions may be required at the time of ultimate disposition of the buildings. Because the remedy will not result in hazardous substances remaining onsite above ARARs, TBCs, or protective standards, a five-year review is not required.

  
\_\_\_\_\_  
Mark N. Silverman, Manager  
U.S. Department of Energy, Rocky Flats Field Office

9/21/95  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Jack W. McGraw  
Deputy Regional Administrator, Region VIII  
U.S. Environmental Protection Agency

10/18/95  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Thomas P. Looby, Director, Office Of Environment  
Colorado Department of Public Health and Environment

9/29/95  
\_\_\_\_\_  
Date

**PAC REFERENCE NUMBER 700 185**

IHSS Reference Number 185 Operable Unit 16

Unit Name Solvent Spill

Approximate Location N750 000 E2 084 000

**DRAFT**

Date(s) of Operation or Occurrence

November 1986

Description of Operation or Occurrence

The fork of a forklift punctured a 55 gallon drum of 1 1 1 trichloroethane (TCA) on the southeast dock of Building 707 causing approximately 4 gallons of the solvent to leak onto the loading dock and adjacent paved areas (DOE 1992a 1992b)

Physical/Chemical Description of Constituents Released

The punctured drum contained TCA

Response to Operation or Occurrence

Four bags of absorbent were used to clean up the spill The absorbent was then cleaned up and placed in drums by the Fire Department and taken to Hazardous Storage (DOE 1992a) This IHSS was then studied in accordance with the Interagency Agreement of 1991 as part of OU 16 (DOE 1992b)

Fate of Constituents Released to the Environment

Although no documentation was found that detailed the fate of the TCA the use of the commercial absorbent to clean up the spill minimized or potentially eliminated the source of TCA contamination Analytical data for groundwater samples collected from a nearby monitoring well indicated that no TCA contamination was present The high vapor pressure of TCA suggested that any residual TCA remaining on the pavement volatilized rapidly Because the spill occurred on a paved area and the cleanup response action of the source was immediate the wind dispersion and infiltration transport pathways are eliminated (DOE 1994) Also no pathway in groundwater was available

Action/No Action Recommendation

Based on information presented in the *Final No Further Action Justification Document for Operable Unit 16 Low Priority Sites* (DOE 1992b) a CAD/ROC recommending No Action under CERCLA for IHSS 185 was prepared and received final approval on October 28 1994 (see attached declaration)

Comments

None

References

DOE 1992a *Historical Release Report for the Rocky Flats Plant* Rocky Flats Plant  
Golden CO

DOE 1992b *Final No Further Action Justification Document for Operable Unit 16 Low Priority Sites* Rocky Flats Environmental Technology Site Golden CO June

DOE 1994 *Corrective Action Decision/Record of Decision for OU16 Low Priority Sites*  
Rocky Flats Environmental Technology Site Golden CO August

# CORRECTIVE ACTION DECISION/ RECORD OF DECISION DECLARATION

## Site Name and Location

Rocky Flats Plant Operable Unit 16 Low Priority Sites  
Golden Jefferson County Colorado

## Statement of Basis and Purpose

This decision document presents the selected remedial action for the Rocky Flats Plant Operable Unit (OU) 16 Low Priority Sites located near Golden Colorado. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 the Colorado Hazardous Waste Act (CHWA) and to the extent practicable the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). OU16 was investigated and a final No Further Action Justification Document (NFAJD) was approved in compliance with the Federal Facility Agreement and Consent Order signed by the U S Department of Energy (DOE) the State of Colorado and the U S Environmental Protection Agency (EPA) on January 22 1991.

## Description of the Selected Remedy. No Action

OU16 Low Priority Sites was originally composed of seven Individual Hazardous Substance Sites (IHSSs). The decision for a No Action remedy for five of the IHSSs (i.e. 185 192 193 194 and 195) was based upon the NCP which provides for the selection of a No Action alternative when a site or OU is already in a protective state. The Risk Evaluation performed in the Final No Further Action Justification document determined that these IHSSs were in a protective state and presented no unacceptable risk to human health and the environment. Further investigation has been recommended for IHSS 196 as part of OU5 and for IHSS 197 as part of OU13.

## Declaration Statement

DOE has determined that no remedial action is necessary to be protective of human health and the environment at *Rocky Flats Plant Operable Unit 16 Low Priority Sites*. Because the remedy will not result in hazardous substances remaining onsite above health based levels a five year review is not required.



Mark N. Silverman Manager  
U S Department of Energy Rocky Flats Field Office

9/24/94

Date



Jack W. McGraw  
Deputy Regional Administrator Region VIII  
U S Environmental Protection Agency

9/29/94

Date



Thomas P. Looby Director Office Of Environment  
Colorado Department of Public Health and Environment

10/2/94

Date

**PAC REFERENCE NUMBER 000 192**

**DRAFT**

IHSS Reference Number 192 Operable Unit 16

Unit Name Antifreeze Discharge

Approximate Location N749 500 E2 084 000 (Building 708 floor drain)

Date(s) of Operation or Occurrence

December 2 or 3 1980

Description of Operation or Occurrence

Approximately 155 gallons of antifreeze solution were discharged from the evaporator of a brine chiller into a floor drain in Building 708 (DOE 1992a 1992b) The floor drain discharged into a buried culvert south of the building The buried culvert ran east from Building 708 under the Building 750 parking lot and terminated at an open culvert just east of Tenth Street This storm runoff collection system discharges from the culvert into South Walnut Creek

Physical/Chemical Description of Constituents Released

The antifreeze solution contained 25 percent ethylene glycol in water (DOE 1992a 1992b)

Response to Operation or Occurrence

The flow was contained by diverting the storm water discharge into retention Pond B 1 Pond B 5 dam was closed and there was no offsite discharge of the liquid Following the release 5 000 gallons of water were flushed through the drainage system into Pond B 1 Based on visual observations of color and flow it was believed that all of the spill was contained in Pond B 1 Follow up samples were collected from several locations and analyzed (DOE 1992a 1992b) This IHSS was then studied in accordance with the IAG of 1991 as part of OU 16 (DOE 1992b)

Fate of Constituents Released to the Environment

Although no direct documentation was found that detailed the fate of the ethylene glycol it is highly unlikely that any of this chemical remains in the environment from this release As described in the *Final No Further Action Justification Documentation for Operable Unit 16 Low Priority Sites* (DOE 1992b) ethylene glycol (250 000 parts per million in antifreeze) would degrade to less than 7 parts per million in approximately 20 to 40 days at surface conditions In addition the degradation of ethylene glycol in multi media

environments was modeled using the fugacity approach the results demonstrated that the concentration of ethylene glycol in leachate would decrease to less than 1 part per billion in 4 days Because the degradation models predicted that no ethylene glycol would be detected in leachate or soils in less than one week following the spill the source would have been completely degraded in the time elapsing since 1980 Without a source there is no risk to human health or the environment (DOE 1994)

#### Action/No Action Recommendation

Based on information presented in the *Final No Further Action Justification Document for Operable Unit 16 Low Priority Sites* (DOE 1992b) a CAD/ROD recommending No Action under CERCLA for IHSS 192 was prepared and received final approval on October 28 1994 (see attached declaration)

#### Comments

None

#### References

DOE 1992a *Historical Release Report for the Rocky Flats Plant* Rocky Flats Plant  
Golden CO

DOE 1992b *Final No Further Action Justification Document for Operable Unit 16 Low Priority Sites* Rocky Flats Environmental Technology Site Golden CO June

DOE 1994 *Corrective Action Decision/Record of Decision for OUI6 Low Priority Sites*  
Rocky Flats Environmental Technology Site Golden CO August

**CORRECTIVE ACTION DECISION/  
RECORD OF DECISION DECLARATION**

Site Name and Location

Rocky Flats Plant Operable Unit 16 Low Priority Sites  
Golden Jefferson County Colorado

Statement of Basis and Purpose

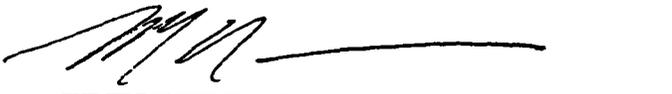
This decision document presents the selected remedial action for the Rocky Flats Plant Operable Unit (OU) 16 Low Priority Sites located near Golden Colorado. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 the Colorado Hazardous Waste Act (CHWA) and to the extent practicable the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). OU16 was investigated and a final No Further Action Justification Document (NFAJD) was approved in compliance with the Federal Facility Agreement and Consent Order signed by the U.S. Department of Energy (DOE) the State of Colorado and the U.S. Environmental Protection Agency (EPA) on January 22 1991.

Description of the Selected Remedy. No Action

OU16 Low Priority Sites was originally composed of seven Individual Hazardous Substance Sites (IHSSs). The decision for a No Action remedy for five of the IHSSs (i.e. 185 192 193 194 and 195) was based upon the NCP which provides for the selection of a No Action alternative when a site or OU is already in a protective state. The Risk Evaluation performed in the Final No Further Action Justification document determined that these IHSSs were in a protective state and presented no unacceptable risk to human health and the environment. Further investigation has been recommended for IHSS 196 as part of OU5 and for IHSS 197 as part of OU13.

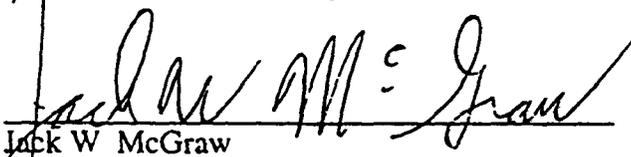
Declaration Statement

DOE has determined that no remedial action is necessary to be protective of human health and the environment at *Rocky Flats Plant Operable Unit 16 Low Priority Sites*. Because the remedy will not result in hazardous substances remaining onsite above health based levels a five year review is not required.



Mark N. Silverman Manager  
U.S. Department of Energy Rocky Flats Field Office

9/24/94  
Date



Jack W. McGraw  
Deputy Regional Administrator Region VIII  
U.S. Environmental Protection Agency

9/29/94  
Date



Thomas P. Looby Director Office Of Environment  
Colorado Department of Public Health and Environment

12.1/94  
Date

**PAC REFERENCE NUMBER 400 193**

IHSS Reference Number 193 Operable Unit 16  
Unit Name Steam Condensate Leak  
Approximate Location N749 100 E2 082 250

**DRAFT**

Date(s) of Operation or Occurrence

During the week ending November 30 1979

Description of Operation or Occurrence

An aboveground steam condensate line located between Building 443 and a valve pit north of a gasoline storage tank was found to be leaking The area between Building 443 and the valve pit was paved at the time of the leak (DOE 1992a 1992b)

Physical/Chemical Description of Constituents Released

The steam condensate was found to contain 0.135 mg/L amines sampling locations were not identified (DOE 1992a 1992b)

Response to Operation or Occurrence

The line was abandoned in place and the condensate was rerouted through a different system by November 30 (DOE 1992a 1992b) This IHSS was then studied in accordance with the IAG as part of OU 16 (DOE 1992b)

Fate of Constituents Released to the Environment

Although no direct documentation was found that detailed the fate of the amines it is highly unlikely that any of this chemical remains in the environment from this release As described in the *Final No Further Action Justification Documentation for Operable Unit 16 Low Priority Sites* (DOE 1992b) the amine compound used as a corrosion inhibitor in steam condensate lines was diethylaminoethanol This alcohol based compound is highly soluble and readily transported in solution by water This amine has a permissible exposure limit (PEL) of 10 mg/L 1½ orders of magnitude greater than the concentration found in the steam condensate This initial concentration would have been diluted even further by years of rainfall and runoff leaving no source present Without a source there is no risk to human health or the environment (DOE 1994)

Action/No Action Recommendation

Based on information presented in the *Final No Further Action Justification Document for Operable Unit 16 Low Priority Sites* (DOE 1992b) a CAD/ROD recommending No Action under CERCLA for IHSS 193 was prepared and received final approval on October 28 1994 (see attached declaration)

Comments

None

References

DOE 1992a *Historical Release Report for the Rocky Flats Plant* Rocky Flats Plant  
Golden CO

DOE 1992b *Final No Further Action Justification Document for Operable Unit 16 Low Priority Sites* Rocky Flats Environmental Technology Site Golden CO June

DOE 1994 *Corrective Action Decision/Record of Decision for OU16 Low Priority Sites*  
Rocky Flats Environmental Technology Site Golden CO August

# CORRECTIVE ACTION DECISION/ RECORD OF DECISION DECLARATION

## Site Name and Location

Rocky Flats Plant Operable Unit 16 Low Priority Sites  
Golden Jefferson County Colorado

## Statement of Basis and Purpose

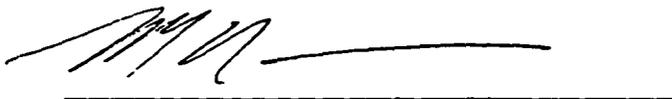
This decision document presents the selected remedial action for the Rocky Flats Plant Operable Unit (OU) 16 Low Priority Sites located near Golden Colorado. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 the Colorado Hazardous Waste Act (CHWA) and, to the extent practicable the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). OU16 was investigated and a final No Further Action Justification Document (NFAJD) was approved in compliance with the Federal Facility Agreement and Consent Order signed by the U.S. Department of Energy (DOE) the State of Colorado and the U.S. Environmental Protection Agency (EPA) on January 22 1991.

## Description of the Selected Remedy. No Action

OU16 Low Priority Sites was originally composed of seven Individual Hazardous Substance Sites (IHSSs). The decision for a No Action remedy for five of the IHSSs (i.e. 185 192 193 194 and 195) was based upon the NCP which provides for the selection of a No Action alternative when a site or OU is already in a protective state. The Risk Evaluation performed in the Final No Further Action Justification document determined that these IHSSs were in a protective state and presented no unacceptable risk to human health and the environment. Further investigation has been recommended for IHSS 196 as part of OUS and for IHSS 197 as part of OU13.

## Declaration Statement

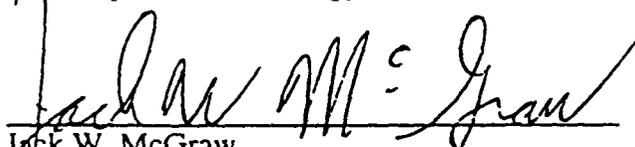
DOE has determined that no remedial action is necessary to be protective of human health and the environment at *Rocky Flats Plant Operable Unit 16 Low Priority Sites*. Because the remedy will not result in hazardous substances remaining onsite above health based levels a five year review is not required.



Mark N. Silverman Manager  
U.S. Department of Energy Rocky Flats Field Office

9/24/94

Date



Jack W. McGraw  
Deputy Regional Administrator Region VIII  
U.S. Environmental Protection Agency

9/29/94

Date



Thomas P. Looby Director Office Of Environment  
Colorado Department of Public Health and Environment

12/2/94

Date

**PAC REFERENCE NUMBER 700 194**

IHSS Reference Number 194 Operable Unit 16  
Unit Name Steam Condensate Leak 700 Area  
Approximate Location N750 000 E2 084 000

**DRAFT**

Date(s) of Operation or Occurrence

September 26 1979

Description of Operation or Occurrence

A steam condensate line break occurred in the Building 707 area The water from the line break flowed into the surface water drainage through Pond B-4 to Walnut Creek (DOE 1992a 1992b)

Physical/Chemical Description of Constituents Released

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 this area was paved at the time of the incident (DOE 1992a 1992b)

Response to Operation or Occurrence

On September 27 surface water drainage was diverted to Pond B 1 and the valve to Pond B 5 was closed (DOE 1992a) This IHSS was then studied in accordance with the Interagency Agreement of 1991 as part of OU 16 (DOE 1992b)

Fate of Constituents Released to the Environment

Between September 26 and 29 1979 surface water sampling results from Pond B-4 ranged in activity from less than 524 pCi/L to approximately 926 pCi/L tritium A 24 hour composite sample collected from Walnut Creek at Indiana Street on September 26 contained 1 163 pCi/L tritium A grab sample collected the next day from the same location contained approximately 700 pCi/L tritium As described in the *Final No Further Action Justification Documentation for Operable Unit 16 Low Priority Sites* (DOE 1992b) tritium is readily transported as a component of surface water and groundwater and is highly mobile within the hydrosphere Tritium decays rapidly and has a half life of 12.26 years Because the released tritium would have undergone one half life decay cycle since the release occurred the present day maximum tritium activity associated with this IHSS is assumed to be less than 500 pCi/L This value is within the range of background activities reported for

64

tritium in surface water as reported in the *Background Geochemical Characterization Report* (EG&G 1990) the maximum tritium background activity was reported as 980 pCi/L. Additional sampling confirmed this assumption. Surface water samples collected from Pond B 1 in 1989 yielded a tritium activity of 360 pCi/L  $\pm$  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 (EG&G 1990). Because the tritium levels associated with this IHSS are within background levels and accepted state and federal standards, there is no risk to human health or the environment (DOE 1992).

#### Action/No Action Recommendation

Based on information presented in the *Final No Further Action Justification Document for Operable Unit 16 Low Priority Sites* (DOE 1992b), a CAD/ROD recommending No Action under CERCLA for IHSS 194 was prepared and received final approval on October 28, 1994 (see attached declaration).

#### Comments

None

#### References

DOE 1992a *Historical Release Report for the Rocky Flats Plant* Rocky Flats Plant Golden, CO

DOE 1992b *Final No Further Action Justification Document for Operable Unit 16 Low Priority Sites* Rocky Flats Environmental Technology Site Golden, CO June

DOE 1994 *Corrective Action Decision/Record of Decision for OU16 Low Priority Sites* Rocky Flats Environmental Technology Site Golden, CO August

EG&G 1990 *Background Geochemical Characterization Report Rocky Flats Plant for 1989* Golden, CO December 21

# CORRECTIVE ACTION DECISION/ RECORD OF DECISION DECLARATION

## Site Name and Location

Rocky Flats Plant Operable Unit 16 Low Priority Sites  
Golden Jefferson County Colorado

## Statement of Basis and Purpose

This decision document presents the selected remedial action for the Rocky Flats Plant Operable Unit (OU) 16 Low Priority Sites located near Golden Colorado. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, the Colorado Hazardous Waste Act (CHWA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). OU16 was investigated and a final No Further Action Justification Document (NFAJD) was approved in compliance with the Federal Facility Agreement and Consent Order signed by the U.S. Department of Energy (DOE), the State of Colorado, and the U.S. Environmental Protection Agency (EPA) on January 22, 1991.

## Description of the Selected Remedy. No Action

OU16 Low Priority Sites was originally composed of seven Individual Hazardous Substance Sites (IHSSs). The decision for a No Action remedy for five of the IHSSs (i.e. 185, 192, 193, 194, and 195) was based upon the NCP which provides for the selection of a No Action alternative when a site or OU is already in a protective state. The Risk Evaluation performed in the Final No Further Action Justification document determined that these IHSSs were in a protective state and presented no unacceptable risk to human health and the environment. Further investigation has been recommended for IHSS 196 as part of OU5 and for IHSS 197 as part of OU13.

## Declaration Statement

DOE has determined that no remedial action is necessary to be protective of human health and the environment at *Rocky Flats Plant Operable Unit 16 Low Priority Sites*. Because the remedy will not result in hazardous substances remaining onsite above health based levels, a five year review is not required.



Mark N. Silverman Manager  
U.S. Department of Energy Rocky Flats Field Office

9/24/94

Date



Jack W. McGraw  
Deputy Regional Administrator Region VIII  
U.S. Environmental Protection Agency

9/29/94

Date



Thomas P. Looby Director Office Of Environment  
Colorado Department of Public Health and Environment

12/1/94

Date

## PAC REFERENCE NUMBER NW 195

IHSS Reference Number 195 Operable Unit 16

Unit Name Nickel Carbonyl Disposal

Approximate Location N754 500 E2 083 000

**DRAFT**

### Date(s) of Operation or Occurrence

March through August 1972

### Description of Operation or Occurrence

From March through August 1972 cylinders of nickel carbonyl were disposed in a dry well located in the buffer zone. The cylinders were opened inside the well and vented with small arms fire to allow decomposition in air (DOE 1994)

### Physical/Chemical Description of Constituents Released

Nickel carbonyl vapors are denser than air. Consequently the vapors collected and decomposed in the bottom of the well. Because these vapors ignite spontaneously ignition occurred either immediately after release into the well or sometime after collection at the bottom of the well (DOE 1992a, 1992b)

### Response to Operation or Occurrence

After 24 hours of placement in the well the cylinders were removed from the hole vented by small arms fire and buried in the Present Landfill. Two cylinders became stuck in the hole and were buried in place. A minimal amount of nickel carbonyl was probably released to the atmosphere during disposal. Samples (presumably of air) from the lip of the well taken after the initial disposal indicated nickel carbonyl concentrations of approximately 10 parts per million being released during disposal (DOE 1992a 1992b). This IHSS was then studied in accordance with the IAG as part of OU 16 (DOE 1992b)

### Fate of Constituents Released to the Environment

Nickel carbonyl is highly volatile and readily decomposes in the presence of oxygen forming nickel oxide. Nickel oxide is highly insoluble in groundwater. For every gram (0.002 pound) of nickel oxide in contact with typical groundwater approximately  $10^{26}$  microgram of nickel per liter is transferred to solution. Wind dispersion subsequently disseminated the nickel oxide particles which therefore would not be detected at concentrations exceeding background. IHSS 195 does not pose a risk to human health and the environment because there are no viable transport pathways.

Action/No Action Recommendation

Based on information presented in the *Final No Further Action Justification Document for Operable Unit 16 Low Priority Sites* (DOE 1992b) a CAD/ROD recommending No Action under CERCLA for IHSS 195 was prepared and received final approval on October 28 1994 (see attached declaration)

Comments

None

References

DOE 1992a *Historical Release Report for the Rocky Flats Plant* Rocky Flats Plant  
Golden CO

DOE 1992b *Final No Further Action Justification Document for Operable Unit 16 Low Priority Sites* Rocky Flats Environmental Technology Site Golden CO June

DOE 1994 *Corrective Action Decision/Record of Decision for OU16 Low Priority Sites*  
Rocky Flats Environmental Technology Site Golden CO August

# CORRECTIVE ACTION DECISION/ RECORD OF DECISION DECLARATION

## Site Name and Location

Rocky Flats Plant Operable Unit 16 Low Priority Sites  
Golden Jefferson County Colorado

## Statement of Basis and Purpose

This decision document presents the selected remedial action for the Rocky Flats Plant Operable Unit (OU) 16 Low Priority Sites located near Golden Colorado. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, the Colorado Hazardous Waste Act (CHWA) and to the extent practicable the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). OU16 was investigated and a final No Further Action Justification Document (NFAJD) was approved in compliance with the Federal Facility Agreement and Consent Order signed by the U.S. Department of Energy (DOE), the State of Colorado, and the U.S. Environmental Protection Agency (EPA) on January 22, 1991.

## Description of the Selected Remedy. No Action

OU16 Low Priority Sites was originally composed of seven Individual Hazardous Substance Sites (IHSSs). The decision for a No Action remedy for five of the IHSSs (i.e. 185, 192, 193, 194, and 195) was based upon the NCP which provides for the selection of a No Action alternative when a site or OU is already in a protective state. The Risk Evaluation performed in the Final No Further Action Justification document determined that these IHSSs were in a protective state and presented no unacceptable risk to human health and the environment. Further investigation has been recommended for IHSS 196 as part of OU5 and for IHSS 197 as part of OU13.

## Declaration Statement

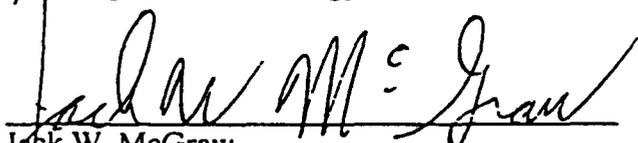
DOE has determined that no remedial action is necessary to be protective of human health and the environment at Rocky Flats Plant Operable Unit 16 Low Priority Sites. Because the remedy will not result in hazardous substances remaining onsite above health based levels, a five year review is not required.



Mark N Silverman Manager  
U.S. Department of Energy Rocky Flats Field Office

9/24/94

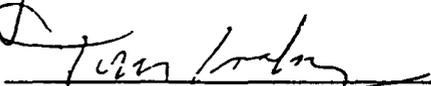
Date



Jack W McGraw  
Deputy Regional Administrator Region VIII  
U.S. Environmental Protection Agency

9/29/94

Date



Thomas P Looby Director Office Of Environment  
Colorado Department of Public Health and Environment

12/1/94

Date