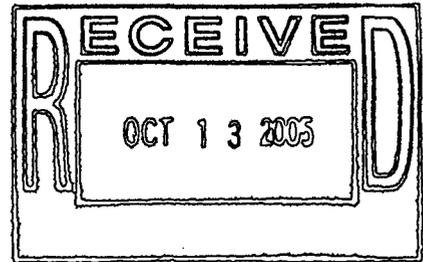


**Data Summary Report
for IHSS Group 000-3
PAC 000-505, Storm Drains**

Approval received from the Colorado Department of Public Health and Environment
(October 6, 2005).
Approval letter contained in the Administrative Record.



October 2005

ADMIN RECORD

IA-A-002851

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ACRONYMS

AL	action level
CDPHE	Colorado Department of Public Health and Environment
COC	Contaminant of concern
D&D	Decontamination and Decommissioning
DOE	U.S. Department of Energy
dpm/g	disintegrations per minute per gram
Ft	foot
ft ³	cubic foot
ft ²	square foot
FY	Fiscal Year
HRR	Historical Release Report
IA	Industrial Area
IASAP	Industrial Area Sampling and Analysis Plan
IHSS	Individual Hazardous Substance Site
ITS	Interceptor Trench System
μCi	microcurie
μg/kg	micrograms per kilogram
mg/L	milligrams per liter
N/A	not applicable
NFAA	No Further Accelerated Action
NPWL	New Process Waste Lines
OPWL	Original Process Waste Lines
OU	Operable Unit
PAC	Potential Area of Concern
PCBs	polychlorinated biphenyls
pCi/g	picocuries per gram
pCi/L	picocuries per Liter
PCOC	potential contaminant of concern
ppm	parts per million
RCP	reinforced concrete pipe
RCR	Regulatory Contact Record
RCRA	Resource Conservation and Recovery Act
RCT	Radiological Control Technician
RFCA	Rocky Flats Cleanup Agreement
RFETS or Site	Rocky Flats Environmental Technology Site
RFI/RI	RCRA Facility Investigation/Remedial Investigation
RL	Reporting Limit
SAP	Sampling and Analysis Plan
SEP	Solar Evaporation Pond
SSRS	Subsurface Soil Risk Screen
SVOC	semi-volatile organic compound
TPH	total petroleum hydrocarbons
UBC	Under Building Contamination
VOC	volatile organic compound

WRW

wildlife refuge worker

1.0 INTRODUCTION

This Data Summary Report summarizes activities conducted at Individual Hazardous Substance Site (IHSS) Group 000-3, Potential Area of Concern (PAC) 000-505, Storm Drains, at the Rocky Flats Environmental Technology Site (RFETS or Site) near Golden, Colorado. The location of IHSS Group 000-3, PAC 000-505 is shown on Figure 1. Only storm drains within the Industrial Area (IA) are included in the PAC description (DOE 1999). The disposition of IHSSs and PACs in IHSS Group 000-3 is listed in Table 1.

Table 1
IHSS Group 000-3 Disposition Documents

IHSS/PAC	Disposition Document
PAC 000-500 – Sanitary Sewer System	No Further Accelerated Action Justification for Sanitary Sewer System, PAC Reference Number 000-500 (DOE 2005a) approved by CDPHE (CDPHE 2005a)
PAC 000-505 – Storm Drains	Data Summary Report for IHSS Group 000-3, PAC 000-505
IHSS 143 – Old Outfall	No Further Accelerated Action Justification for 771 Outfall, PAC Reference Number 700-143 (DOE 2004a) approved by CDPHE (CDPHE 2004a)
IHSS 190 – Central Avenue Ditch Caustic Leak	No Further Accelerated Action Justification for Caustic Leak, PAC Reference Number 000-190 (DOE 2004b) approved by CDPHE (CDPHE 2004b)

2.0 EXISTING INFORMATION

Storm drains were identified as a PAC in the 1999 Annual Update to the Historical Release Report (HRR) (DOE 1999). At that time, 239 storm drains were thought to be present at RFETS. The current storm drain configuration is shown on Figure 1. Figure 1 was updated based on a review of Site drawings during work planning and to more accurately reflect field conditions. Additionally, the Interceptor Trench System [ITS] was removed from Figure 1. The ITS is not part of the storm drain system and was inadvertently included on the original figure. The total length of storm drains in PAC 000-505 measures 50,975 linear feet (ft).

The storm drains provided Site drainage from roads, parking lots, and other areas and discharge into the creeks and drainages north and south of the Site. Some footing drains from site buildings also discharge to storm drains. The storm drains were designed to convey surface water away from the Site however, unplanned accidental discharges to the system have also occurred.

3.0 POTENTIAL RELEASES AND THEIR DISPOSITION

There are eight specific contaminant release areas associated with PAC 000-505, many of which are separate IHSSs or PACs within other IHSS Groups. These contaminant release areas were dispositioned in accordance with Attachment 5 of the Rocky Flats Cleanup Agreement (RFCA) (DOE et al. 2003). The disposition of these sites is summarized in Table 2 and briefly described in the following sections. In addition, information on the release to Pond A-4 from Buildings 771/774 is summarized in Section 3.9.

Table 2
PAC 000-505 Release Site Disposition

IHSS	Disposition Document
IHSS 143 – Old Outfall	No Further Accelerated Action Justification for 771 Outfall PAC Reference Number 700-143 (DOE 2004a) approved by CDPHE (CDPHE 2004a)
IHSS 173 – Wash Water From The Degreasing Of Depleted Uranium Parts Near Building 991	Data Summary Report for IHSS Group 900-1 (DOE 2004c) approved by CDPHE (CDPHE 2004c)
IHSS 400-205 – Release Of Nitric Acid/Nitrad Waste Solution From Building 460	Data Summary Report for IHSS Group 400-5 (DOE 2004d) approved by CDPHE (CDPHE 2004d)
PAC 400-803 – Release Of Miscellaneous Materials Into The Storm Drain West Of Building 446	Data Summary Report for IHSS Group 400-4 (DOE 2004e) approved by CDPHE (CDPHE 2004e)
PAC 700-1103 – PCB Runoff From Building 707	Closeout Report for IHSS Group 700-2 (DOE 2005b) approved by CDPHE (CDPHE 2005b)
PAC 400-801 – PCB Runoff From Building 444 Courtyard	Data Summary Report for IHSS Group 400-3 (DOE 2003a) approved by CDPHE (CDPHE 2003) and Data Summary Report for IHSS Group 000-3, PAC 000-505
IHSS 150.2[S] – Building 776 Storm Drain	Closeout Report for IHSS Group 700-3, IHSS 118.1 and Outside IHSSs (DOE 2005c) approved by CDPHE (CDPHE 2005c) and Data Summary Report for IHSS Group 000-3, PAC 000-505
Building 371 Ditch And Storm Drain Runoff	Data Summary Report for IHSS Group 000-3, PAC 000-505

3.1 Potential Contamination at Building 771 Storm Drain (IHSS 143 – Old Outfall)

Various waste liquids from laundry and decontamination facilities, the analytical laboratory, radiography sinks, and runoff from the Building 771 roof and ground areas were discharged into the Building 771 storm drain from 1953 until mid-1957.

Approximately 4.5 million gallons of liquid with a total activity of 2.23 microcuries (μCi) were released. Because of equipment problems, periodic releases from the laundry holding tanks to the 771 Outfall continued until 1965. From 1957 until 1965, 430,000 gallons were released containing an alpha activity of 0.25 μCi (DOE 1992).

Several soil removal actions were completed around the storm drain and are described in the 2004 Annual Update to the HRR (DOE 2004f). Approximately 350 cubic feet (ft^3) of contaminated soil was removed from an approximately 750-square foot (ft^2) area. Soil samples collected from the storm drain area indicated the contamination was localized and did not travel downstream. By the end of August 1971, 149 drums of contaminated soil were removed from an area approximately 800 ft^2 that was as deep as 3.5 ft in one small area. Final soil sampling results averaged 34 disintegrations per minute per gram (dpm/g) with a maximum of 150 dpm/g. Additional soil removal was conducted in the summer of 1980 and resulted in removal of nine boxes of contaminated soil.

IHSS 143 (Old Outfall) was proposed for No Further Accelerated Action (NFAA) in 2004 (DOE 2004a). Metals, radionuclides, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, and polychlorinated biphenyls (PCBs) were identified as potential contaminants of concern (PCOCs) in soil. All PCOC concentrations were less than the Wildlife Refuge Worker (WRW) Action Levels (ALs) in surface soil (DOE et al. 2003). Contaminants of concern (COCs) detected at concentrations greater than the WRW AL in subsurface soil included barium, strontium, Aroclor-1254, radionuclides, and VOCs. The Subsurface Soil Risk Screen (SSRS) (DOE et al 2003) was applied to the subsurface soil data, and indicated that soil removal at the outfall area was not necessary. It was concluded that previous remedial activities at this IHSS effectively addressed the release of contamination (DOE 2004a). The U.S. Department of Energy (DOE) received concurrence from the Colorado Department of Public Health and Environment (CDPHE) on the NFAA status for the site on September 7, 2004 (CDPHE 2004a).

3.2 Wash Water From the Degreasing of Depleted Uranium Parts Near Building 991 (IHSS 173)

Cleaning operations were performed on depleted uranium parts in the open courtyard of Building 991 during the late 1950s and early 1960s. Parts were degreased with acetone and other organic solvents. Spills and water washdowns were flushed into the storm drains which discharged into South Walnut Creek (DOE 1999).

IHSS 173 was characterized as part of the Operable Unit (OU) 8 Resource Conservation and Recovery Act (RCRA) Facility Investigation/Remedial Investigation (RFI/RI) and the IHSS Group 900-1 characterization. Results from the OU 8 RFI/RI (which was not completed) indicated copper was the only analyte detected above background in surface soil and was present at concentrations only slightly greater than background. One surface and subsurface soil sample were collected from IHSS 173 as part of the IHSS Group 900-1 characterization. Results indicate metals and uranium were detected in surface and subsurface soil at concentrations or activities greater than background, but less than RFCA WRW soil ALs (DOE 2004c). CDPHE approved IHSS 173 for NFAA on March 31, 2004 (CDPHE 2004c).

3.3 Release of Nitric Acid/Nitrad Waste Solution From Building 460 (IHSS 205)

In April 1989, between 5 and 7 gallons of nitric acid/nitrad (a mixture of nitric acid, acetic acid, and ammonium bifluoride) waste solution from Building 460 entered a storm drain that feeds into Pond C-2 (DOE 1999).

Accelerated action characterization activities were conducted at IHSS 205 in accordance with IA Sampling and Analysis Plan (SAP) (IASAP) Addendum #IA-03-14 (DOE 2003b). Based on the potential contaminants released, three surface and subsurface soil samples were collected and analyzed for radionuclides, metals, SVOCs, and VOCs. While uranium isotopes and metals were detected at activities or concentrations greater than background values, analytical results indicated all other PCOCs were less than RFCA WRW soil ALs. The accelerated action characterization activities and rationale for an NFAA decision at IHSS 205 are discussed in detail in the Data Summary Report for IHSS Group 400-5 (DOE 2004d). CDPHE approved IHSS 205 for NFAA on December 7, 2004 (CDPHE 2004d)

3.4 Release Of Miscellaneous Materials Into The Storm Drain West Of Building 446 (PAC 400-803)

Miscellaneous materials including silver paint and possibly oil and aluminum paint were reportedly dumped into the storm drain immediately west of Building 446. PAC 400-803 was investigated in accordance with IASAP Addendum #IA-04-14 for IHSS Group 400-4 (DOE 2004g). Six surface and subsurface soil characterization samples were collected and analyzed for radionuclides, metals, and SVOCs. Concentrations in soil were less than the RFCA WRW soil ALs except for benzo(a)pyrene in surface soil and dibenz(a,h)anthracene in subsurface soil. These two COCs were detected at concentrations of 35,000 µg/kg and 10,000µg/kg, respectively at PAC 400-803. Based on the SSRS, subsurface soil removal was not required (DOE 2004e) and an NFAA was approved by CDPHE on August 23, 2004 (CDPHE 2004e).

3.5 PCB Runoff From Building 707 (PAC 700-1103)

Transformers 707-1 through 707-6 were located on the eastern side of the Building 707 roof, and were known to have leaked dielectric coolant. Analytical data from the nearby soil and swipe samples from the concrete pad confirmed the pad on the roof and the soil on the ground immediately east of Building 707 were contaminated with PCBs. The soil contamination resulted from rainwater collecting on the rooftop where the transformers were located, then flowing through a downspout to the ground. At that time, there was concern that PCBs had migrated to an existing storm drain more than 100 ft downgradient (DOE 1992). In 1995, approximately 65 cubic yards of soil were removed from beneath and around the downspout. Confirmation samples were collected in the area of the downspout and downgradient of the contaminated area including in the ditch that went into the storm drain. Aroclor-1254 was detected at concentrations ranging from 0.31 to 0.83 parts per million (ppm) in the ditch (DOE 2005b). CDPHE approved PAC 700-1103 for an NFAA on March 15, 2005 (CDPHE 2005b).

3.6 PCB Runoff From Building 444 Courtyard (PAC 400-801)

This PAC represents the release of transformer oil from a transformer that was located on the roof of Building 447. Downspouts were located north of the transformer's former position, which would have allowed PCB-contaminated runoff to infiltrate soil adjacent to Building 447. A storm drain is situated roughly 20 ft from the building and may have been contaminated (DOE 1992). As part of the Site-Wide Evaluation of Known, Suspect, and Potential Environmental Releases of PCBs conducted in July 1991, a sediment sample was collected from the storm drain sump. Analytical results indicated the presence of PCBs at 54,000 micrograms per kilogram ($\mu\text{g}/\text{kg}$). This exceeded the WRW AL of 12,400 $\mu\text{g}/\text{kg}$.

In accordance with IASAP Addendum #IA-03-06 for IHSS Group 400-3 (DOE 2003c), which included PAC 400-801, additional accelerated action soil samples were collected at five surface and subsurface locations in this area. PCOCs included radionuclides, metals, and PCBs. Analytical results indicated all contaminant activities and concentrations were less than RFCA WRW soil ALs (DOE 2003c, DOE et al. 2003). Uranium isotopes were detected at all five surface locations, and metals were detected at one surface location. Uranium isotopes were detected at all five subsurface locations, and metals were detected at one subsurface location (DOE 2003a). PAC 400-801 received NFAA approval from CDPHE on December 18, 2003 (CDPHE 2003a).

The storm drain sump and associated PCB-contaminated sediment were removed as part of the Decontamination and Decommissioning (D&D) of Building 447 in 2005. After removal, two soil samples were collected at this location and analyzed for PCBs. Results indicated that Aroclor-1254 was present at an estimated concentration of 38 $\mu\text{g}/\text{kg}$ and Aroclor-1260 was present at a concentration of 52 $\mu\text{g}/\text{kg}$. The manhole was filled with 10 to 15 ft of concrete starting from the bottom of the manhole.

The storm drain pipeline remains in place however, both ends were plugged with concrete at the manholes. The storm drain was disrupted in three places and plugged with flow fill south of Building 440 and north of Building 447. At the disruption north of Building 440 concrete was used to plug the pipe. This 8-inch diameter pipe was previously reported as perforated however, as determined during field activities, it is constructed of corrugated metal pipe. Approximately 10 yards of flow fill was used at each location. Soil at the outfall of this pipeline was also sampled. Results indicated PCB concentrations are less than WRW soil ALs.

3.7 Building 776 Storm Drain [IHSS 150.2(S)]

The Building 776 storm drain is within IHSS 150.2 (S), Radioactive Site West of Buildings 771 and 776. The south (S) designation refers to the radioactive site west of Building 776. On May 11, 1969, a fire occurred in Buildings 776/777. The IHSS is the result of plutonium being tracked outside of Building 776 by firefighting and support personnel, and was detectable on the ground west of the building. A storm drain runs along the western side of the building.

IHSS 150.2(S) was characterized as part of IHSS Group 700-3. Analytical results from samples collected in subsurface soil in the vicinity of the storm drains indicated uranium-234, uranium-235, uranium-238, and Aroclor-1254 were detected at activities or

concentrations greater than background levels or reporting limits (RLs), but considerably less than WRW soil ALs (DOE 2005c). No accelerated action was required and IHSS 150.2(S) was approved for NFAA on April 19, 2005 (CDPHE 2005c).

The storm drain was removed from the point where it originated at the building to the location northwest of the building where it had been cut and removed previously. The storm drain outfall was also removed. Field screen samples collected from under the culvert were clean. Radiological Control Technicians (RCTs) screened the culvert and outfall and results were at background. One soil sample was collected from underneath the culvert and the results indicated radionuclides were well below WRW soil ALs. Uranium was detected at activities close to the detection limit. Americium-241 was not detected. The area was backfilled.

3.8 Building 371 Ditch and Storm Drain Runoff

Although there were no reported specific contaminant release events to a Building 371 storm drain or ditch, these drains and ditches were sampled in 1987. Results of the 1987 sample analyses are listed in Table 3. It is not known whether samples were collected during a storm event or from standing water (DOE 1999).

Table 3
Analytical Results from Building 371 Storm Drains and Ditches

Sampling Location	Analyte	Result	Surface Water Standard
Storm Drains	Gross Alpha	24 +/- 8 pCi/L	11 pCi/L
Storm Drains	Gross Beta	64 +/- 4 pCi/L	19 pCi/L
Storm Drains	pH	6.8	
Storm Drains	NO ₃ as N	0.53 mg/L	10 mg/L
Ditches (North)	Gross Alpha	18 +/- 16 pCi/L	11 pCi/L
Ditches (North)	Gross Beta	14 +/- 34 pCi/L	19 pCi/L
Ditches (North)	NO ₃ as N	1.27 mg/L	10 mg/L
Ditches (South)	Gross Alpha	19 +/- 13 pCi/L	11 pCi/L
Ditches (South)	Gross Beta	16 +/- 35 pCi/L	19 pCi/L
Ditches (South)	NO ₃ as N	0.33 mg/L	10 mg/L

As shown in Table 3, the gross alpha and beta concentrations in the storm drains and ditches are of the same order of magnitude as the surface water standards, and nitrate is well below the surface water standard.

In accordance with IASAP #IA-03-01 (DOE 2003d), which included IHSS Group 300-3 (Under Building Contamination [UBC] 371), surface and subsurface soil samples were collected from the western side of Building 371 close to the storm drain associated with the southern ditch. These data indicate metals and uranium isotopes were detected at concentrations greater than background values but considerably less than WRW soil ALs (DOE 2003e). An NFAA was approved for IHSS Group 300-3 in 2003 (CDPHE 2003b).

More recent surface water data from performance monitoring location SW018, established in October 2003 in the unnamed drainage just east of Buildings 371/374,

indicated that americium-241, plutonium-239/240, and total uranium activities at SW018 were well below their surface water standards of 0.15, 0.15, and 10 picocuries per liter (pCi/L), respectively.

Table 4
Radionuclide Concentrations at SW018

Sample Collection Date	Americium-241 (pCi/L)	Pluotnium-239/240 (pCi/L)	Total Uranium (pCi/L)
10/13/2003	0.013	0.000	1.835
11/10/2003	0.000	0.000	2.584
12/18/2003	0.007	0.006	2.371
3/8/2004	0.004	0.021	1.950
4/12/2004	0.010	0.016	1.767
4/26/2004	0.008	0.017	2.953
5/11/2004	0.032	0.053	2.976
6/3/2004	0.020	0.040	1.849
6/18/2004	0.021	0.067	1.764
6/28/2004	0.006	0.022	2.438

3.9 Ponds A-3 and A-4

As a result of the routine pre-discharge sampling for Pond A-4, conducted on November 3, 2004, elevated americium-241 activities were noted in Pond A-4. These elevated activities were detected in samples collected by both DOE and CDPHE. These activities exceeded the RFCA surface water ALs for americium-241 and, as a result, the pond water was not discharged.

In early December 2004, DOE collected a number of surface water samples in the North Walnut Creek Drainage to investigate the source of elevated americium-241 noted in Ponds A-3 and A-4. The sampling was concentrated in the area where Buildings 771/774 formerly stood. One sample, collected from a pool of water in Original Process Waste Lines (OPWL) Manway 3, northwest of Building 771, contained elevated americium-241 activities without significant plutonium-239/240 activity, which is the same americium-241/plutonium-239/240 signature observed in Ponds A-3 and A-4. This manway received outfall from former Building 771 and consisted of a series of sanitary sewer lines, footing drains, and so forth that dumped into storm drain Grate 771-4 at Sixth Street.

Based on this sampling result, actions to stop any additional water from this source from entering North Walnut Creek were taken. The manway, which was covered with soil as a result of site grading activities at former Building 771, was excavated and flows from the incoming pipes were intercepted, analyzed, and treated as needed. All pipes to and from the manway were removed, as well as the manway itself. The storm drain from Building 771 was grouted.

Subsequently, the water in Pond A-4 was treated using a co-precipitation and filtration process and met stream standards for discharge.

3.10 Drainages and Ditches

Drainages and ditches associated with and connecting the storm drain system were sampled as part of IHSS, PAC, or other sitewide investigations. While all drainages and ditches were not sampled, those targeted during IHSS, PAC, and sitewide investigations focused on areas with suspected contamination/spills and likely represent the most conservative view of potential contamination. Results from sediment sampling indicated that concentrations of radionuclides, metals, PCBs, and SVOCs were less than WRW soil ALs. Additionally, soil, sediment, and pipeline removal at Bowman's Pond (PAC 700-1108) further reduced potential impacts associated with the storm drain system. Potential impacts were also mitigated by backfilling culvers, ditches, and drainage ways and recontouring the land surface.

4.0 ACTIONS

Storm drains were disrupted, removed, or retained for use after site closure. The disposition of all storm drains is shown on Figure 2. Because not all actions are finalized, a final map of storm drain disposition will be included in the 2005 Historical Release Report. As shown, most storm drains were removed. For the most part, storm drains were removed unless they were very deep or removal presented slope stability problems. Storm drains ranged from 1.5 to 45 ft below the surface. Approximately 45,475 ft of storm drains were removed and approximately 5,500 ft of storm drains remain. Storm drains left in place were flow-filled or grouted except for storm drain associated with Functional Channel 2 (C-126). Approximately 210 ft of this storm drain remains. The disposition of pipes left in place is summarized in Table 5. Several photographs of storm drain removal activities are included in Appendix A.

All remaining storm drains in the IA, except for C-126 and those listed in Table 5 will be removed.

Manholes and storm grates associated with removed storm drains were removed along with the storm drain. Manholes and storm grates associated with plugged storm drains were removed to 3 ft below grade and the remaining structure was flow-filled. Manholes and storm grates at the intersection of storm drains left or removed, were removed. The disposition of the manholes and storm grates is shown on Figure 2.

4.1 Removal Action Events

Several events occurred during removal actions that resulted in additional storm drain removal or soil sampling. Two of these were noted above in Sections 3.6 and 3.7. Additional events are briefly described below:

- During culvert removal north of the former location of Building 774, a diesel spill was encountered at a depth of approximately 4.5 ft below the current (and final) ground surface. The exposed material was sampled and a total petroleum hydrocarbon (TPH) field screen showed a concentration of approximately 290 ppm which is less than the RFCA cleanup level for TPH. The excavation was backfilled. Reference Regulatory Contact Record (RCR) dated April 9, 2005 (Appendix B).

- Pipeline P-5060, which travels due south from the Building 444 courtyard, was intercepted at three different locations and flow-filled. Samples were collected where the pipeline left the building and the results are discussed in Section 3.6.
- Pipeline P-124a is the culvert that runs northwest from Building 776. Samples were collected and the results are discussed in Section 3.7.
- As part of the New Process Waste Line (NPWL) remediation near the Building 771 area, Manhole 3 was excavated and the storm drains and other associated lines in that area were plugged.
- Pipelines P-5106a and P-5106b were isolated from P-5106 and the northern end of both lines were grouted to approximately 40 feet. The remaining section of P-5106 was interrupted at 4 locations: 2 at the intersections of P-5106a and P-5106b, 1 at Manhole 3, where the east/west line turns northwest, and 1 approximately 60 feet west of the P-5106a intersect. The section of P-5106 which ran from Manhole 3 to the storm drain culvert G-771-4 was completely removed.

5.0 SUBSURFACE SOIL RISK SCREEN

Screen 1 – Are Contaminant of Concern (COC) Concentrations Below Table 3 Wildlife Refuge Worker (WRW) Soil Action Levels?

No. All subsurface COC concentrations are less than the WRW soil ALs, except for detections of benzo(a)pyrene and dibenz(a,h)anthracene. These two COCs were detected at concentrations of 35,000 and 10,000 $\mu\text{g}/\text{kg}$, respectively, at PAC 400-803.

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

Yes. Based upon Figure 1 of RFCA Attachment 5 (DOE et al. 2003), many of the storm drains are in areas where there is potential for subsurface soil to become surface soil. PAC 400-803, where the benzo(a)pyrene and dibenzo(a,h)anthracene WRW soil AL exceedances are noted, is not located in an area considered prone to landslides or erosion. Additionally, storm drain areas have been or will be backfilled and will be graded to achieve a final configuration. All areas have been or will be reseeded. These activities will further reduce erosion potential in storm drain areas.

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

No. All radiological activities in and around storm drains were less than criteria specified in Section 5.3 and Attachment 14.

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

No. Contaminant migration via erosion is the most likely pathway whereby surface water could become contaminated by PAC 000-505 COCs. However, migration via erosion is unlikely because the majority of the storm drains and culverts have been removed or

**Table 5
Disposition of Pipes Left In Place**

Storm Drain	Location	Final Status	Flow-filled or Plugged	Comments
C-126	Functional Channel 2	Left in place	N/A	Left as part of Function Channel 2
P-183c/P-183d	Eastern part of Central Avenue near IHSS Group 900-2	Section removed/remainder left in place	Flow-filled portion left in place	The manhole was left in place and flow-filled.
C-114	Northeast of SEP	Left in place	Flow-filled	
P-5105a/b	Between SEP207A and 207C	Left in place	Plugged on ends	
P-2045	North of Building 774	Never found/removed	N/A	This line was apparently removed a earlier because it was never found during the removal of P-5000 nor at Bowman's Pond.
P-5002/P-5002a	East of Building 771	Left in place	Plugged at north ends	
P-5003/P-5003a	North of Building 774	Left in place	Plugged at north ends	
P-2055/P-2055a	East of Building 774	Section removed/remainder left in place	Plugged at north end	
Abandoned 60 inch Reinforced Concrete Pipe (RCP)	North of Bowman's Pond	Section removed/remainder left in place	Flow-filled	The section remaining was flow-filled.
P5054, P5070, P5071, P5072, P5073, P5074, P5075, P5111	Around Building 460	Left in place	Disrupted in several places and plugged	The grates were removed and each inlet was plugged. The section that connects the system to the outfall into the Original Landfill was removed.
P5078 / P5082	South of Building 460	Section removed/remainder left in place	Flow-filled	Southeast end of P5082 was removed, the remainder of P5078 and P5082 was flow-filled.
P-5060	South of Building 447	Left in place and disrupted at 3 locations	Flow-filled	P5060 was disrupted north of 447, north of 440, and south of 440 and flow-filled
P-262/263	North of Building 334	Will be flow-filled or grouted	Will be flow-filled or grouted	August or September 2005
C-50	Southwest of Building 374	Will be flow-filled or grouted	Will be flow-filled or grouted	August or September 2005
C-51	South of Building 374	Will be flow-filled or grouted	Will be flow-filled or grouted	August or September 2005
P-5106	North of Building 771	Interrupted in 4 locations (See Section 4.1)	Grouted at the northern end of P-5106a and b; Grouted at interruptions	August 2005

disrupted. Additionally PAC 400-803, which includes the benzo(a)pyrene and dibenzo(a,h)anthracene WRW soil AL exceedances is not in an area prone to erosion.

6.0 NO FURTHER ACCELERATED ACTION RECOMMENDATION

PAC 000-505 is proposed for NFAA because of the following:

- Storm drains and culverts were removed to at least 3 ft below ground surface or disrupted except for one storm drain in the IA which is part of Functional Channel 2.
- The specific potential release areas discussed in Section 3.0 were investigated and, if necessary, remediated.
- The storm drain sump and associated PCB-contaminated sediment at PAC400-801 were removed as part of the Decontamination and Decommissioning (D&D) of Building 447 in 2005. After removal, two soil samples were collected at this location and analyzed for PCBs. Results indicated that Aroclor-1254 was present at an estimated concentration of 38 µg/kg and Aroclor-1260 was present at a concentration of 52 µg/kg. The manhole was filled with 10 to 15 ft of concrete starting from the bottom of the manhole.
- The storm drain along the western side of Building 776 in IHSS 150.2(S) was removed. Samples indicated residual radionuclide activities are close to background values.
- The benzo(a)pyrene and dibenzo(a,h)anthracene WRW soil AL exceedances at PAC 400-803 did not require remediation because, in accordance with the SSRS, they are not located in an area considered prone to landslides or erosion (DOE 2004e).
- Results from sediment sampling in drainages and ditches conducted during this and other investigations indicated contaminant concentrations were less than WRW soil ALs.
- Potential impacts were mitigated by backfilling culverts, ditches, and drainage ways and recontouring the land surface.
- The SSRS does not indicate subsurface soil removal is necessary.

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Appendix A
Project Photographs

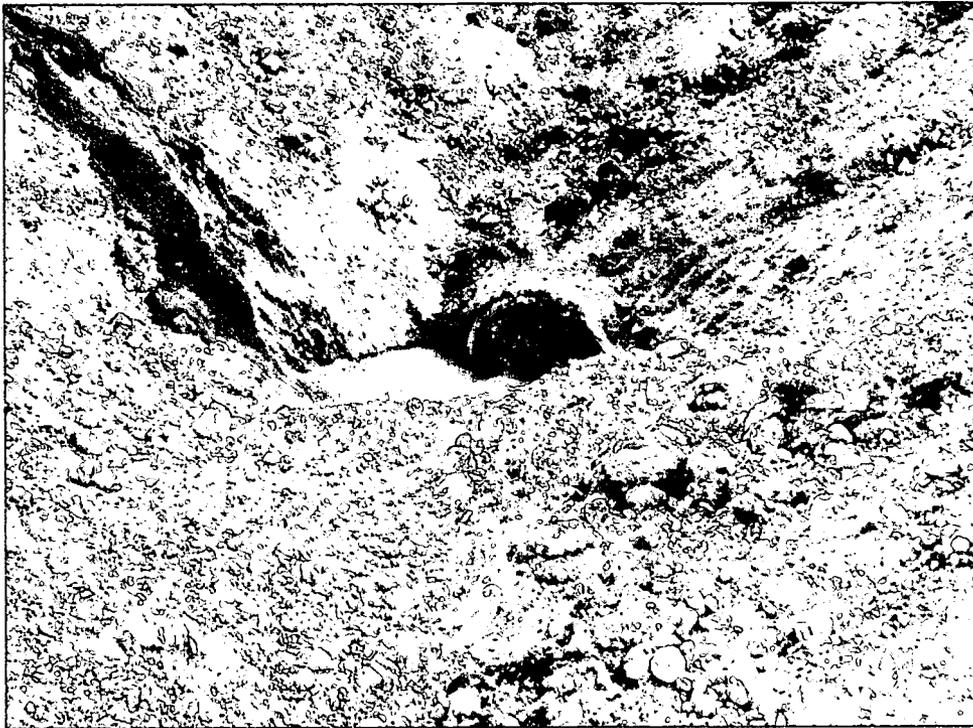
Photograph 1
Storm Drain Removal



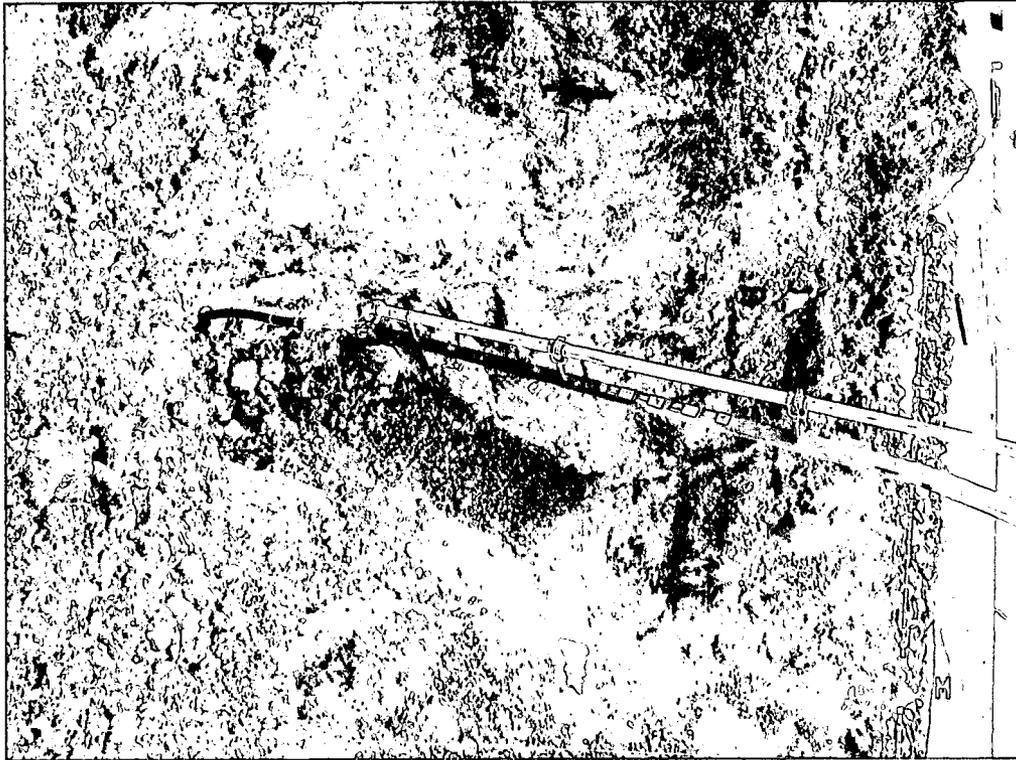
Photograph 2
Storm Drain Removal



Photograph 3
P-183



Photograph 4
60" RCP South of FC-3



Photograph 5
Interruption of Culvert 5060 Under B440 North Side



Photograph 6
Building 440 Drain Flow fill



Photograph 7
Interruption of Culvert 5060 (under B444 North Side) Showing Removed, Stretched
Culvert and Broken North Side.



Appendix B

Correspondence

**ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
ER REGULATORY CONTACT RECORD**

Date/Time: April 19, 2005, 9:00

Site Contact(s): Annette Primrose Norma Castaneda
Phone: 966-4385 966-4226

Regulatory Contact: David Kruchek
Phone: 303 692-3328

Agency: CDPHE

Purpose of Contact: Historic diesel spill in the B774 area

Discussion

During culvert removal north of the former location of B774, a diesel spill was encountered at a depth of about 4 ½ feet below the current (and final) ground surface. The exposed material was sampled and a TPH field screen showed a concentration of around 290 ppm. Therefore, the excavation will be backfilled. This information will be included in the storm drain No Further Accelerated Action justification.

Contact Record Prepared By: Annette Primrose

Required Distribution:

Additional Distribution:

M. Aguilar, USEPA	J. Legare, DOE-RFPO	_____
H. Ainscough, CDPHE	D. Mayo, K-H RISS	_____
J. Berardini, K-H	S. Nesta, K-H RISS	_____
B. Birk, DOE-RFPO	L. Norland, K-H RISS	_____
L. Brooks, K-H ESS	E. Pottorff, CDPHE	_____
G. Carnival, K-H RISS	A. Primrose, K-H RISS	_____
N. Castaneda, DOE-RFPOM.	Roy, DOE-RFPO	_____
C. Deck, K-H Legal	R. Schassburger, DOE-RFPO	_____
N. Demos, SSOC	S. Serreze, K-H RISS	_____
S. Garcia, USEPA	D. Shelton, K-H ESS	_____
S. Gunderson, CDPHE	C. Spreng, CDPHE	_____
S. Johnson, K-H ESS	S. Surovchak, DOE-RFPO	_____
M. Keating, K-H RISS	J. Walstrom, K-H RISS	_____
L. Kimmel, USEPA	K. Wiemelt, K-H RISS	_____
D. Kruchek, CDPHE	C. Zahm, K-H Legal	_____

Figure 2 PAC 000-505 Storm Drain Disposition (Based on Status)

- ☐ Intercepted Plugged Location
- EXPLANATION**
- Storm Sewer Grates
 - Storm Sewer Manhole
- LEGEND Culverts & Drains**
- Remove
 - Retain with cleanout/repair
 - Retain & Remain Operational
 - Retain & Plug Ends
- LEGEND Culverts & Drains Dispositioned**
- ////// Removed
 - ////// Retained with cleanout/repair
 - ////// Retained & Remain Operational
 - ////// Retained & Plugged Ends
 - ////// Never Found or Was Removed Earlier
- ✂ Storm Sewer Grates Removed
 - Storm Sewer Manhole Removed
 - ✂ Storm Sewer Grates Retained & Plugged
 - Storm Sewer Manhole Retained & Plugged
- Map Features**
- ▨ Demolished Buildings
 - Lakes
 - Streams



N

1:3,128
1 inch equals 260 feet

State Plane Coordinate Projection
Colorado Central Zone (3476)
Datum: NAD27

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

Prepared By: **CH2MHILL**

Prepared For: **KAISER HILL COMPANY**

September 28, 2005

IA-A-002851
1 of 2

PATH: \\naissv\GIS\Projects\2004\04-0483\Susan\CulvertHa-closure_Uilities_Culverts_Map2_Y1-S_20050928.mxd

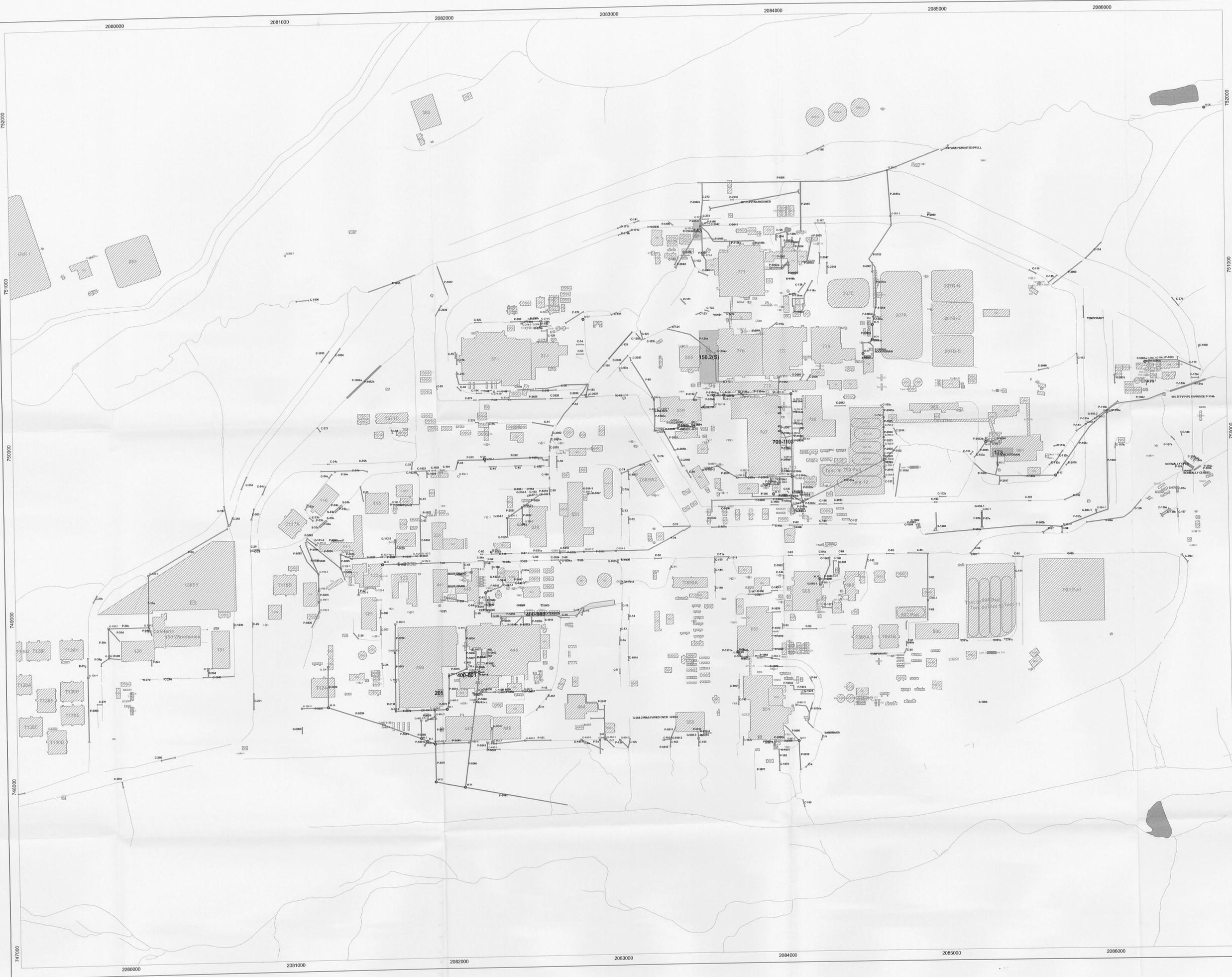
Figure 1 PAC 000-505 Storm Drains (Based on Omnibus Plan)

EXPLANATION

- Storm Sewer Grates
- Storm Sewer Manhole
- Retain & Remain Operational
- Retain & Plug Ends or Flowfill
- Remove
- IHSS
- PAC

Map Features

- ▨ Demolished Buildings
- Lakes
- Streams



1:3,129
1 inch equals 260 feet



Slate Plane Coordinate Projection
Colorado Central Zone (3476)
Datum: NAD27

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

GIS Dept. (303) 966-7707



July 19, 2005

IAA-002851
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