NOTICE

All drawings located at the end of the document.

Revision 3/03

CORRES. CONTROL
OUTGOING LTR NO.

DOE ORDER #

03 RF 01574

DIST.	LTR	ENC
Berardini, Jacqueline	X	
BRAILSFORD, M.D		
FERRERA, D.W.	X	
FERRI, M.S.		
FULTON, J.C.		
GIACOMINI, J.		
HALL, L.		
MARTINEZ, L.A.		
PARKER, A.M.		
POWERS, K.		
SCOTT, G.K.		
SHELTON, D.C.	X	
SPEARS, M.S.		
TRICE, K.D.		
VOORHEIS, G.M.		
BUTLER, J.L.	X	X
BROUSSARD, M.	X	X
COR. CONTROL	X	X
ADMN. RECORD	X	X
WASTE REC. CTR		
TRAFFIC		
PATS/130		
CLASSIFICATION:		
UCNI		
UNCLASSIFIED		
CONFIDENTIAL		
SECRET		

AUTHORIZED CLASSIFIER SIGNATURE
Exemption – CEX-105-01

Date

IN REPLY TO RFP CC NO:

ACTION ITEM STATUS

☐ PARTIAL/OPEN

☐ CLOSED

LTR APPROVALS:

ORIG & TYPIST INITIALS

KAISER•HILL
COMPANY

October 16, 2003 03-RF-01574

Mr. Joe Legare
Assistant Manager for
Environment and Infrastructure
DOE, RFFO

Mr. Steve Gunderson
Colorado Department of Public Health and Environment
4300 Cherry Creek Drive South
Denver, CO 80246-1502

Mr. Gary Kleeman
U.S. Environmental Protection Agency
99918th Street, Suite 300
Denver, CO 80202-2466

TRANSMITTAL OF THE NO FURTHER ACCELERATED ACTION JUSTIFICATION FOR RADIOACTIVE SITES SOUTH AND NORTHEAST OF BUILDING 779, IHSS GROUPS 150.6 AND 150.8 – JLB-106-03

Enclosed are copies of the No Further Accelerated Action Justification for Radioactive Sites South and Northeast of Building 779, IHSS Groups 150.6 and 150.8 for your verification and subsequent approval. Previous comments have been incorporated as discussed. DOE will request formal approval from your staff upon completion of their verification.

If you have any questions, please contact me at extension 5245.

R. Lee Norland for
J. Lane Butler
Manager, Environmental Restoration Programs

OCT 2003
RECEIVED
RECORDS CENTER
ADMIN RECORD

JLB:kg

IA-A-001693

Orig and 1 cc – Joe Legare
cc: Norma Castaneda

Enclosures:
As Stated

NO FURTHER ACCELERATED ACTION JUSTIFICATION FOR RADIOACTIVE SITES SOUTH AND NORTHEAST OF BUILDING 779

PAC REFERENCE NUMBER: 700-150.6 and 700-150.8

IHSS Reference Number: 150.6 and 150.8, Operable Unit 8

Unit Name: Radioactive Site South of Building 779 (150.6) and Radioactive Site Northeast of Building 779 (150.8)

Approximate Location: N750,500; E2,084,500 (150.6)
N750,600; E2,084,500 (150.8)

Date(s) of Operation or Occurrence

June 1969

Description of Operation or Occurrence

In June 1969, radioactive contamination occurred due to an improperly opened waste drum in Building 779, and was spread by pedestrians tracking the contamination to areas east (IHSS 700-150.8) and south (IHSS 700-150.6) of the building (DOW 1974) (Figure 1). The drum was being cut apart near a dock at Building 779, and it contained residual oil with radionuclides (DOE 1995). The main dock for Building 779 was located along the northern half on the east side of the building. Although the exact pathway along which workers walked is unknown, it is known that the buildings's south entrance was also contaminated. It is unclear whether workers got from the dock to the south entrance by walking inside the building, or by walking outside and around the building. The surface outside the building was mostly paved, and was heavily used by pedestrian traffic (DOE 1995).

Physical/Chemical Description of Constituents Released

The release consisted of radionuclides from radioactive waste. Contamination was measured at up to 50,000 dpm/100 cm^2 for gross alpha activity.

Responses to Operation or Occurrence

Contaminated soil was placed in barrels and removed for off-site disposal (DOW 1974). It is not known whether all areas affected by this incident were included in cleanup activities. It is also not known if the removal of soil was in response to the incident described above or a separate incident (DOE 1995).

3

Fate of Constituents Released to Environment

No documentation was found which detailed the complete removal of contamination. These IHSSs were investigated in accordance with the RCRA Facility Investigation/Remedial Investigation (RFI/RI) Work Plan for Operable Unit 8, 700 Area (DOE, 1994), which included visual observations, radiological surveys (i.e., high purity germanium [HPGe] and sodium iodide [NaI] surveys), and surface soil and sediment sampling. The surface soil samples were collected beneath paved areas and in unpaved areas. The results of the investigation are reported in the Rocky Flats Environmental Technology Site Industrial Area Data Summary Report (DOE 2000).

IHSSs 700-150.6 and 150.8 have been adequately characterized through implementation of the RFI/RI Work Plan for Operable Unit 8. Figures 2 and 3 show the surface and subsurface soil sampling locations. As can be seen from these figures, the surface soil sampling coverage is very good. Subsurface soil at IHSS 700-150.6 was not sampled, and at IHSS 700-150.8, there is one adjacent borehole (43593) where subsurface soil was sampled. Subsurface soil was sampled at this borehole because the borehole was drilled to install well 43593 as part of the Solar Evaporation Ponds investigation. The well is just north of IHSS 700-150.8. Subsurface soil was not sampled as part of the RFI/RI Work Plan for Operable Unit 8 because the contaminant release was pedestrian traffic spreading radionuclides at the surface in an area that was mostly paved, i.e., subsurface soil contamination would not have occurred from the incident. The subsurface soil in this area will, however, be characterized as part of IHSS Group 700-7, as it is in the vicinity of the old solar pond that was transferred to this IHSS group.

Table 1 summarizes the sample analysis program at IHSSs 700-150.6 and 700-150.8 based on current available data collected during the previous investigations. As can be seen, surface soil samples were primarily analyzed for metals, radionuclides, and semi-volatile organic compounds (SVOCs), although there were also some pesticide and polychlorinated bipheny (PCB) analyses at IHSS 700-150.8. Volatile Organic Compounds (VOCs) were not analyzed because they were not expected to be present due to volatilization. Subsurface soil in borehole 43593 was analyzed for metals, radionuclides, and VOCs.

The surface and subsurface soil data are summarized in Tables 2 and 3, respectively. These tables show analytes that were detected above background (see discussion below). In these tables, the following decision rules were applied to the calculation of summary statistics:

1. Data rejected during validation was eliminated from the data set before computing statistics.
2. The maximum value is the highest detected value observed.
3. The average was computed using only data that are above background concentrations.
4. All detection limits were adequate, i.e., less than the respective RFCA Action Levels (ALs) (Wildlife Refuge Worker [WRW] or Ecological Receptor).

4

Figures 4 and 5 show, for surface and subsurface soil, respectively, all the data that were detected above background, and that have a RFCA AL (WRW or Ecological Receptor). The ALs are from RFCA Attachment 5, dated May 28, 2003. Background levels for inorganic constituents for subsurface soil are from the Background Geochemical Characterization Report (DOE 1993). Background values for surface soils and sediments are from Geochemical Characterization of Background Surface Soils: Background Soils Characterization Program (DOE 1995b). All background values used for comparison are the mean background value plus two standard deviations. Any detection of an organic compound is considered an above background level observation.

SURFACE SOIL ASSESSMENT

As shown in Table 2 and Figure 4, metals, radionuclides, and SVOCs were detected above background in surface soil at many locations throughout IHSSs 150.6 and 150.8. However, in all cases, concentrations were well below the WRW ALs. Lead concentrations exceeded the Ecological Receptor AL at SS808893 and SS809293; however, in both cases the concentrations were below background for surface soil (Figure 4).

APPLICATION OF THE SUBSURFACE SOIL RISK SCREEN

The Subsurface Soil Risk Screen is not applicable to the NFAA determination for IHSS 150.6 and 150.8 because the contaminant release was radionuclides at the ground surface, and therefore, subsurface soil contamination would not have occurred from the incident. The subsurface soil in this area will, however, be characterized as part of IHSS Group 700-7. For information purposes, above background concentrations of analytes in subsurface soil samples collected from borehole 43593 are shown in Table 3 and Figure 5.

STEWARDSHIP ANALYSIS

Assessment of the surface soil data at IHSSs 700-150-6 and 700-150.8 indicates No Further Accelerated Action (NFAA) is necessary for protection of public health and environment. This conclusion is drawn because analyte concentrations in surface soil are below either the WRW/Ecological Receptor ALs, or background levels. Accordingly, near-term and long-term stewardship actions are not necessary for these IHSSs per se. However, because these IHSSs are within the Industrial Area, both near-term and long-term stewardship actions have been recommended. They are discussed below.

Near-Term Management Recommendations

Near-term recommendations for environmental stewardship include the following:

- Excavation at the sites will continue to be controlled through the Site Soil Disturbance Permit process; and
- Site access and security controls will remain in place pending implementation of long-term controls.

5

Long-Term Stewardship Recommendations

Based on remaining environmental conditions at IHSSs 700-150-6 and 700-150.8, no specific long-term stewardship activities are recommended beyond the generally applicable Site requirements that may be imposed on this area in the future, which are dependent upon the final remedy selected. Institutional controls that will be used as appropriate for this area include the following:

- Prohibitions on construction of buildings;
- Restrictions on excavation or other soil disturbance; and
- Prohibitions on groundwater pumping in the area.

These specific long-term stewardship recommendations will also be summarized in the Rocky Flats *Long Term Stewardship Strategy*. No engineered controls, environmental monitoring, or physical controls (e.g., fences) are recommended as a result of the conditions remaining at IHSSs 700-150-6 and 700-150.8.

IHSS 700-150-6 and 700-150.8 will be evaluated as part of the Site-Wide Comprehensive Risk Assessment, which is part of the RCRA Facility Investigation/Remedial Investigation (RFI/RI) and Corrective Measures Study/Feasibility Study (CMS/FS) that will be conducted for the Site. The need for and extent of long-term stewardship activities will be reanalyzed in RFI/RI and CMS/FS and will be proposed, as appropriate, as part of the preferred alternative in the Proposed Plan for the Site. Institutional controls and other long-term stewardship requirements for Rocky Flats will ultimately be contained in the Corrective Action Decision/Record of Decision, in any post-closure Colorado Hazardous Waste Act permit that may be required, and in any post-RFCA agreement.

NFAA Summary

IHSSs 700-150.6 and 700-150.8 are proposed for NFAA. Assessment of the surface soil data at IHSSs 700-150-6 and 700-150.8 indicates analyte concentrations in surface soil are below either the WRW/Ecological Receptor ALs, or background levels. Therefore, it is concluded that no further accelerated action is required at IHSSs 700-150-6 and 700-150.8.

References

DOE, 1994. *RCRA Facility Investigation/Remedial Investigation (RFI/RI) Work Plan for Operable Unit 8, 700 Area,* U.S. Department of Energy.
DOE, 2000. *Rocky Flats Environmental Technology Site Industrial Area Data Summary Report*, U.S. Department of Energy, September 2000.
DOW, 1974. *Environmental Inventory, A Historical Summation of Environmental Incidents Affecting Soils at or Near the U.S. AEC Rocky Flats Plant*, DOW Chemical USA, January 29, 1974.

6

Table 1 Analytical Program Summary

Analytical Suite	Number of Locations	IHSS 150.6 Surface Soil Sample Location Codes							
Metals	3	SS809393	SS809493	SS809593					
Radionuclides	3	SS809393	SS809493	SS809593					
SVOCs	3	SS809393	SS809493	SS809593					
		IHSS 150.8 Surface Soil Sample Location Codes							
Metals	8	43593	SS808693	SS808793	SS808893	SS808993	SS809093	SS809193	SS809293
Radionuclides	8	43593	SS808693	SS808793	SS808893	SS808993	SS809093	SS809193	SS809293
SVOCs	8	43593	SS808693	SS808793	SS808893	SS808993	SS809093	SS809193	SS809293
Pesticides	1	43593							
PCBs	1	43593							
		IHSS 150.8 Subsurface Soil Sample Location Codes							
Metals	1	43593							
Radionuclides	1	43593							
VOCs	1	43593							

Table 2 Surface Soil Contamination Summary

IHSS 150.6

Analyte Group	Analyte	Total Number Samples Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	Background Mean Plus 2SD	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Unit
Metal	Copper	3	33 %	18.4	18.4	18.05999947	4.09×10^4	-	mg/kg
Radionuclide	Americium-241	3	33 %	0.057	0.057	0.022700001	7.6×10^1	1.9×10^3	pci/g
Radionuclide	Plutonium-239/240	3	33 %	0.28	0.28	0.066	5.0×10^1	3.8×10^3	pci/g
SVOC	bis(2-Ethylhexyl)phthalate	3	33 %	76	76	-	1.97×10^6	-	ug/kg
SVOC	Di-n-butylphthalate	3	33 %	150	150	-	7.37×10^7	-	ug/kg
SVOC	Di-n-octylphthalate	3	33 %	44	44	-	1.47×10^7	-	ug/kg
SVOC	Fluoranthene	3	33 %	65	65	-	2.72×10^7	-	ug/kg
SVOC	Pyrene	3	33 %	57	57	-	2.21×10^7	-	ug/kg
	Above the Wildlife Refuge Worker or Ecological Receptor Action Level								

IHSS 150.8

Analyte Group	Analyte	Total Number Samples Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	Background Mean Plus 2SD	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Unit
Metal	Cadmium	8	12%	2.9	2.9	1.61	9.62×10^2	-	mg/kg
Metal	Copper	8	62 %	40.12	106	18.06	4.09×10^4	-	mg/kg
Metal	Iron	8	12 %	20900	20900	18037.00	3.07×10^5	-	mg/kg
Metal	Manganese	8	12 %	468	468	365.08	348×10^3	-	mg/kg
Metal	Strontium	8	12 %	50.7	50.7	48.94	6.13×10^5	-	mg/kg
Metal	Zinc	8	25 %	310.8	544	73.76	3.07×10^5	-	mg/kg
Radionuclide	Americium-241	8	50 %	0.237	0.4	0.02	7.6×10^1	1.9×10^3	pci/g
Radionuclide	Plutonium-239/240	8	50 %	1.57	2.6	0.07	5.0×10^1	3.8×10^3	pci/g
SVOC	Benzo(a)anthracene	9	11 %	69	69	-	3.49×10^4	8.00×10^5	ug/kg
SVOC	Benzo(a)pyrene	9	11 %	86	86	-	3.49×10^3	257×10^4	ug/kg
SVOC	Benzo(b)fluoranthene	9	11 %	150	150	-	3.49×10^4	101×10^6	ug/kg
SVOC	Benzo(k)fluoranthene	9	11 %	190	190	-	3.49×10^5	1.01×10^6	ug/kg
SVOC	bis(2-Ethylhexyl)phthalate	9	44 %	79	120	-	1.97×10^6	-	ug/kg

Analyte Group	Analyte	Total Number Samples Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	Background Mean Plus 2SD	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Unit
SVOC	Butylbenzylphthalate	9	22 %	465	760	-	1.47×10^{8}	-	ug/kg
SVOC	Chrysene	9	11 %	89	89	-	3.49×10^{6}	-	ug/kg
SVOC	Di-n-butylphthalate	9	22 %	40	41	-	737×10^{7}	-	ug/kg
SVOC	Fluoranthene	9	33 %	69	130	-	2.72×10^{7}	-	ug/kg
SVOC	Indeno(1,2,3-cd)pyrene	9	11 %	70	70	-	3.49×10^{4}	-	ug/kg
SVOC	Pyrene	9	11 %	140	140	-	2.21×10^{7}	-	ug/kg
	Above the Wildlife Refuge Worker or Ecological Receptor Action Level								

Table 3 Subsurface Soil Contamination Summary

IHSS 150.8*

Analyte Group	Analyte	Total Number Samples Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	Background Mean Plus 2SD	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Unit
Metal	Manganese	1	100 %	1000.00	1000	365.08	3.48×10^{3}	-	mg/kg
Radionuclide	Americium-241	1	100 %	4.00	4	0.02	7.6×10^{1}	1.9×10^{3}	pci/g
Radionuclide	Plutonium-239/240	1	100 %	25.00	25	0.07	5.0×10^{1}	3.8×10^{3}	pci/g
VOC	Methylene chloride	3	67 %	18.50	25	-	2.53×10^{6}	3.95×10^{4}	ug/kg
VOC	Toluene	3	100 %	42.67	70	-	3.13×10^{7}	128×10^{5}	ug/kg
	Above the Wildlife Refuge Worker or Ecological Receptor Action Level								

*Subsurface soil analytical data was not collected at IHSS 150.6

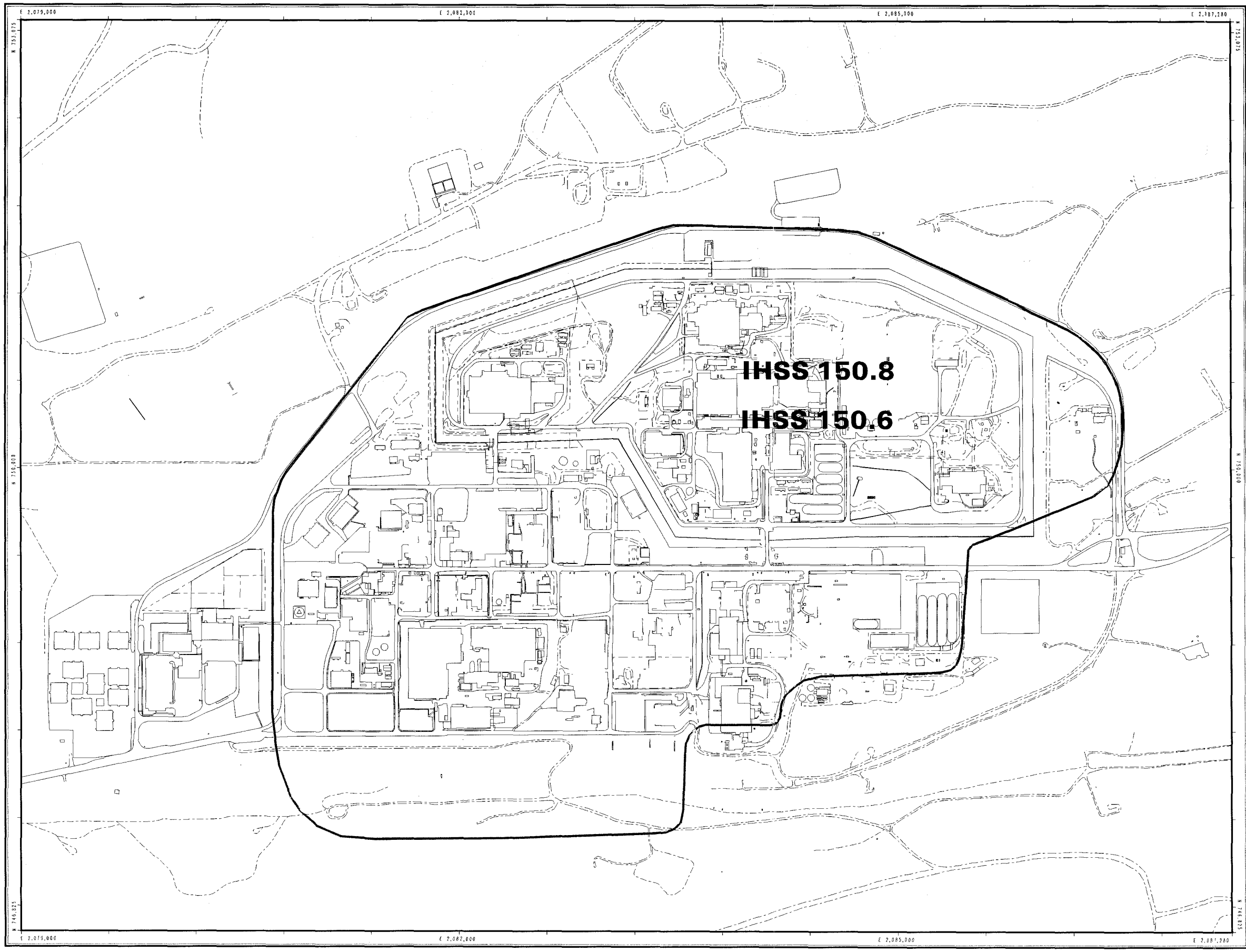

Figure 1

IHSS 150.6 & 150.8 Locations

EXPLANATION

IHSS 150.6
IHSS 150.8

Standard Map Features

Buildings and other structures

Lakes and ponds

Streams, ditches, or other drainage features

Fences and other barriers

Paved roads

Dirt roads

Industrial Area Operable Unit Boundary

DATA SOURCE BASE FEATURES:
PACs
Historical Release Report (HRR)
2nd Annual Update
Sept. 30, 1997
Individual Hazardous Substance Sites (IHSS)
DOE, 1992, HRR Report and Subsequent Updates.
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas.
Digitized from the orthophotographs. 1/95

Scale = 1 : 8060
1 inch represents approximately 672 feet

250 0 500 1000ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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

GIS Dept. 303-966-7707

DRAFT

September 17, 2003

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11

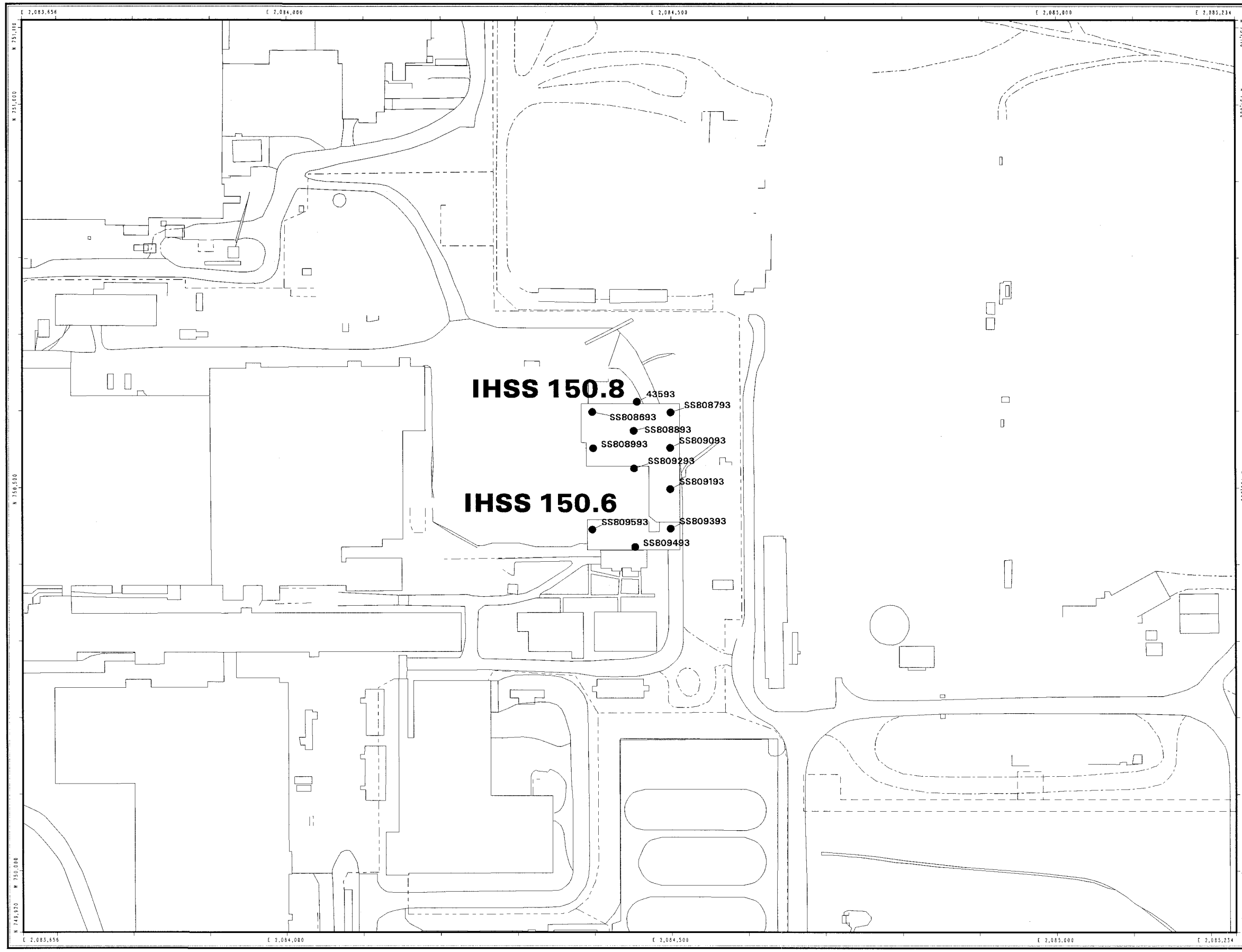

Figure 2

IHSS 150.6 & 150.8 Surface Soil Sampling Locations

EXPLANATION

IHSS 150.6
IHSS 150.8

Sample Location

Standard Map Features

Buildings and other structures

Lakes and ponds

Streams, ditches, or other drainage features

Fences and other barriers

Paved roads

Dirt roads

DATA SOURCE BASE FEATURES:
PACs
Historical Release Report (HRR)
3rd Annual Update
Sept. 30, 1997
Individual Hazardous Substance Sites (IHSS)
DOE, 1992, HRR Report and Subsequent Updates.
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas.
Digitized from the orthophotographs. 1/95

Scale = 1 : 1540
1 inch represents approximately 128 feet

50 0 100 200ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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

GIS Dept. 303-966-7707

DRAFT

October 09, 2003

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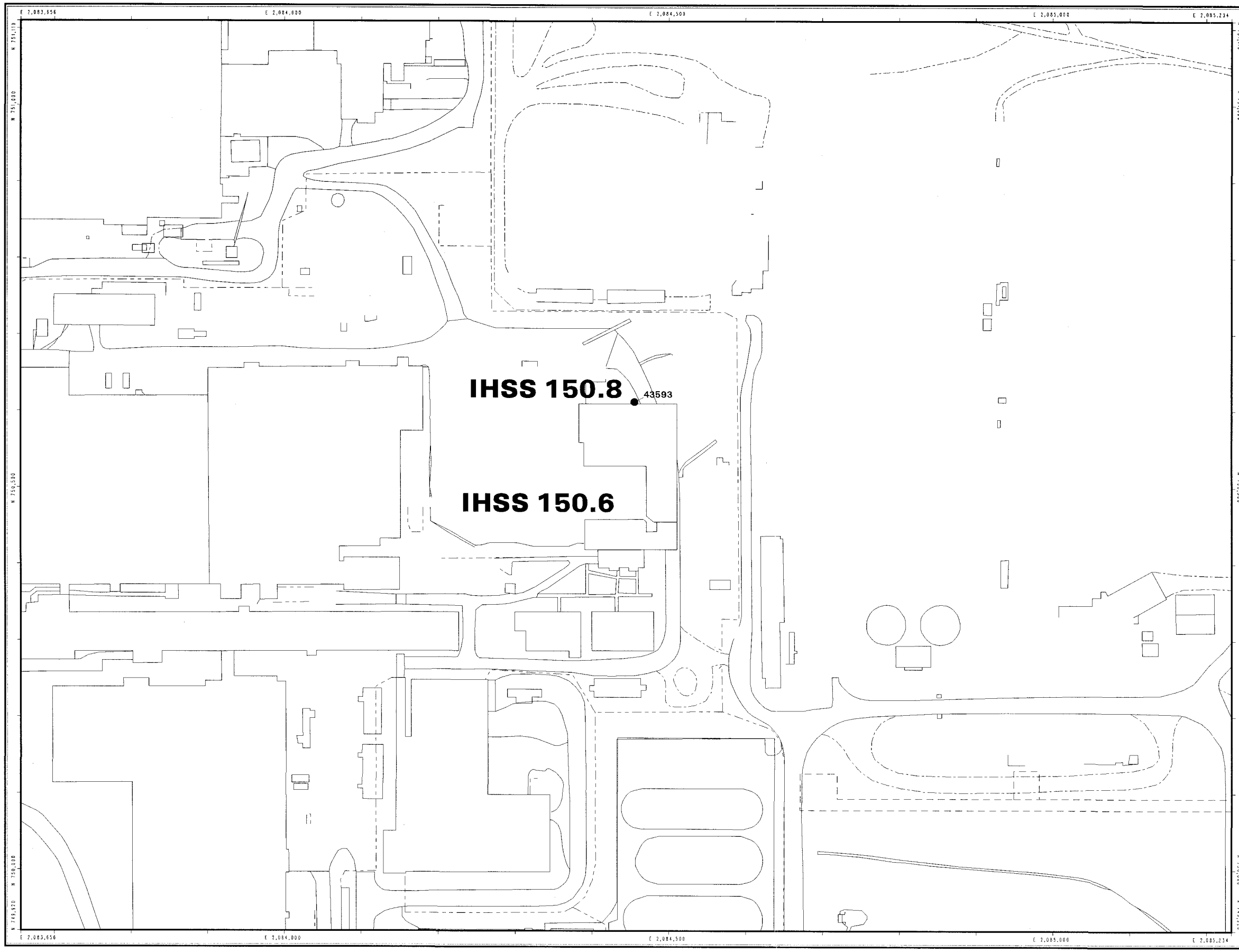

Figure 3

IHSS 150.6 & 150.8 Subsurface Soil Sampling Locations

EXPLANATION

IHSS 150.6
IHSS 150.8

Sample Location

Standard Map Features

Buildings and other structures

Lakes and ponds

Streams, ditches, or other drainage features

Fences and other barriers

Paved roads

Dirt roads

DATA SOURCE BASE FEATURES:
PACe
Historical Release Report (HRR)
2nd Annual Update
Sept. 30, 1997
Individual Hazardous Substance Sites (IHSS)
DOE, 1992, HRR Report and Subsequent Updates.
Buildings, fences, hydrography, roads and other structures from 1994 aerially over data captured by EG&G RSL, Las Vegas.
Digitized from the orthophotographs. 1/95

N

Scale = 1 : 1540
1 inch represents approximately 128 feet

50 0 100 200ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
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GIS Dept. 303-966-7707

DRAFT

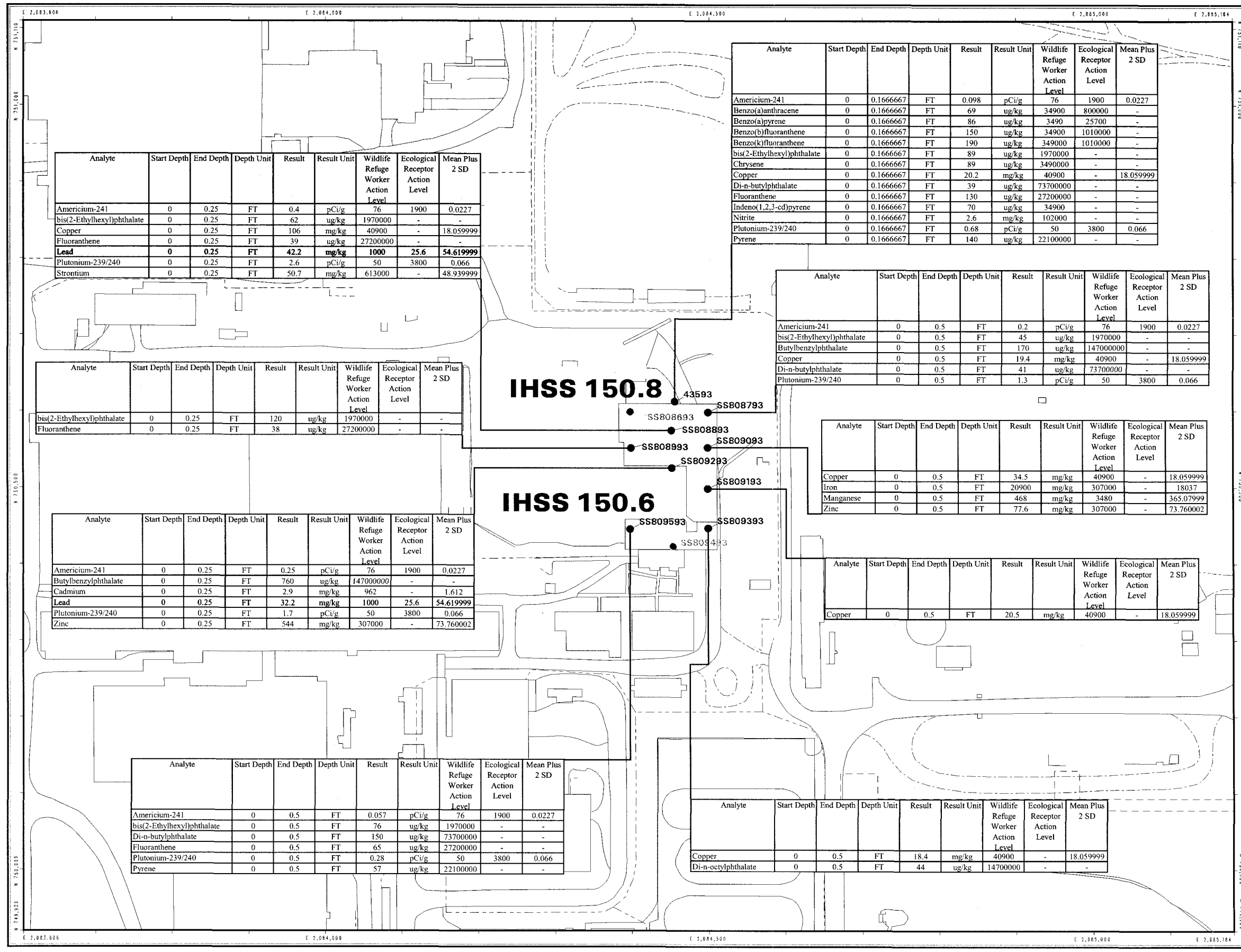
September 17, 2003

NT_Svr w:/projects/fy2003/03-0544/has_150_f3_subsoil_samp.aml

13

Figure 4

IHSS 150.6 & 150.8 Surface Soil Contaminant Distribution



Analyte	Start Depth	End Depth	Depth Unit	Result	Result Unit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
Americium-241	0	0.25	FT	0.4	pCi/g	76	1900	0.0227
bis(2-Ethylhexyl)phthalate	0	0.25	FT	62	ug/kg	1970000	-	-
Copper	0	0.25	FT	106	mg/kg	40900	-	18.059999
Fluoranthene	0	0.25	FT	39	ug/kg	27200000	-	-
Lead	**0**	**0.25**	**FT**	**42.2**	**mg/kg**	**1000**	**25.6**	**54.619999**
Plutonium-239/240	0	0.25	FT	2.6	pCi/g	50	3800	0.066
Strontium	0	0.25	FT	50.7	mg/kg	613000	-	48.939999

Analyte	Start Depth	End Depth	Depth Unit	Result	Result Unit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
bis(2-Ethylhexyl)phthalate	0	0.25	FT	120	ug/kg	1970000	-	-
Fluoranthene	0	0.25	FT	38	ug/kg	27200000	-	-

Analyte	Start Depth	End Depth	Depth Unit	Result	Result Unit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
Americium-241	0	0.25	FT	0.25	pCi/g	76	1900	0.0227
Butylbenzylphthalate	0	0.25	FT	760	ug/kg	147000000	-	-
Cadmium	0	0.25	FT	2.9	mg/kg	962	-	1.612
Lead	**0**	**0.25**	**FT**	**32.2**	**mg/kg**	**1000**	**25.6**	**54.619999**
Plutonium-239/240	0	0.25	FT	1.7	pCi/g	50	3800	0.066
Zinc	0	0.25	FT	544	mg/kg	307000	-	73.760002

Analyte	Start Depth	End Depth	Depth Unit	Result	Result Unit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
Americium-241	0	0.1666667	FT	0.098	pCi/g	76	1900	0.0227
Benzo(a)anthracene	0	0.1666667	FT	69	ug/kg	34900	800000	-
Benzo(a)pyrene	0	0.1666667	FT	86	ug/kg	3490	25700	-
Benzo(b)fluoranthene	0	0.1666667	FT	150	ug/kg	34900	1010000	-
Benzo(k)fluoranthene	0	0.1666667	FT	190	ug/kg	349000	1010000	-
bis(2-Ethylhexyl)phthalate	0	0.1666667	FT	89	ug/kg	1970000	-	-
Chrysene	0	0.1666667	FT	89	ug/kg	3490000	-	-
Copper	0	0.1666667	FT	20.2	mg/kg	40900	-	18.059999
Di-n-butylphthalate	0	0.1666667	FT	39	ug/kg	73700000	-	-
Fluoranthene	0	0.1666667	FT	130	ug/kg	27200000	-	-
Indeno(1,2,3-cd)pyrene	0	0.1666667	FT	70	ug/kg	34900	-	-
Nitrite	0	0.1666667	FT	2.6	mg/kg	102000	-	-
Plutonium-239/240	0	0.1666667	FT	0.68	pCi/g	50	3800	0.066
Pyrene	0	0.1666667	FT	140	ug/kg	22100000	-	-

Analyte	Start Depth	End Depth	Depth Unit	Result	Result Unit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
Americium-241	0	0.5	FT	0.2	pCi/g	76	1900	0.0227
bis(2-Ethylhexyl)phthalate	0	0.5	FT	45	ug/kg	1970000	-	-
Butylbenzylphthalate	0	0.5	FT	170	ug/kg	147000000	-	-
Copper	0	0.5	FT	19.4	mg/kg	40900	-	18.059999
Di-n-butylphthalate	0	0.5	FT	41	ug/kg	73700000	-	-
Plutonium-239/240	0	0.5	FT	1.3	pCi/g	50	3800	0.066

Analyte	Start Depth	End Depth	Depth Unit	Result	Result Unit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
Copper	0	0.5	FT	34.5	mg/kg	40900	-	18.059999
Iron	0	0.5	FT	20900	mg/kg	307000	-	18037
Manganese	0	0.5	FT	468	mg/kg	3480	-	365.07999
Zinc	0	0.5	FT	77.6	mg/kg	307000	-	73.760002

Analyte	Start Depth	End Depth	Depth Unit	Result	Result Unit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
Copper	0	0.5	FT	20.5	mg/kg	40900	-	18.059999

Analyte	Start Depth	End Depth	Depth Unit	Result	Result Unit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
Americium-241	0	0.5	FT	0.057	pCi/g	76	1900	0.0227
bis(2-Ethylhexyl)phthalate	0	0.5	FT	76	ug/kg	1970000	-	-
Di-n-butylphthalate	0	0.5	FT	150	ug/kg	73700000	-	-
Fluoranthene	0	0.5	FT	65	ug/kg	27200000	-	-
Plutonium-239/240	0	0.5	FT	0.28	pCi/g	50	3800	0.066
Pyrene	0	0.5	FT	57	ug/kg	22100000	-	-

Analyte	Start Depth	End Depth	Depth Unit	Result	Result Unit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
Copper	0	0.5	FT	18.4	mg/kg	40900	-	18.059999
Di-n-octylphthalate	0	0.5	FT	44	ug/kg	14700000	-	-

EXPLANATION

IHSS 150.6
IHSS 150.8

Above Background Sample Location

Below Background Sample Location

Standard Map Features

Buildings and other structures

Lakes and ponds

Streams, ditches, or other drainage features

Fences and other barriers

Paved roads

Dirt roads

DATA SOURCE BASE FEATURES:
PACs
Historical Release Report (HRR)
2nd Annual Update
Sept. 30, 1997

Individual Hazardous Substance Sites (IHSS)
DOE, 1992, HRR Report and Subsequent Updates.

Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas.
Digitized from the orthophotographs. 1/95

Scale = 1 : 1540
1 inch represents approximately 128 feet

50 0 100 200ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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

GIS Dept. 303-966-7707

DRAFT

October 09, 2003

NT_Svr w:/projects/fy2003/03-0544/ihss_150_14_surfsoil_cont_dist.aml

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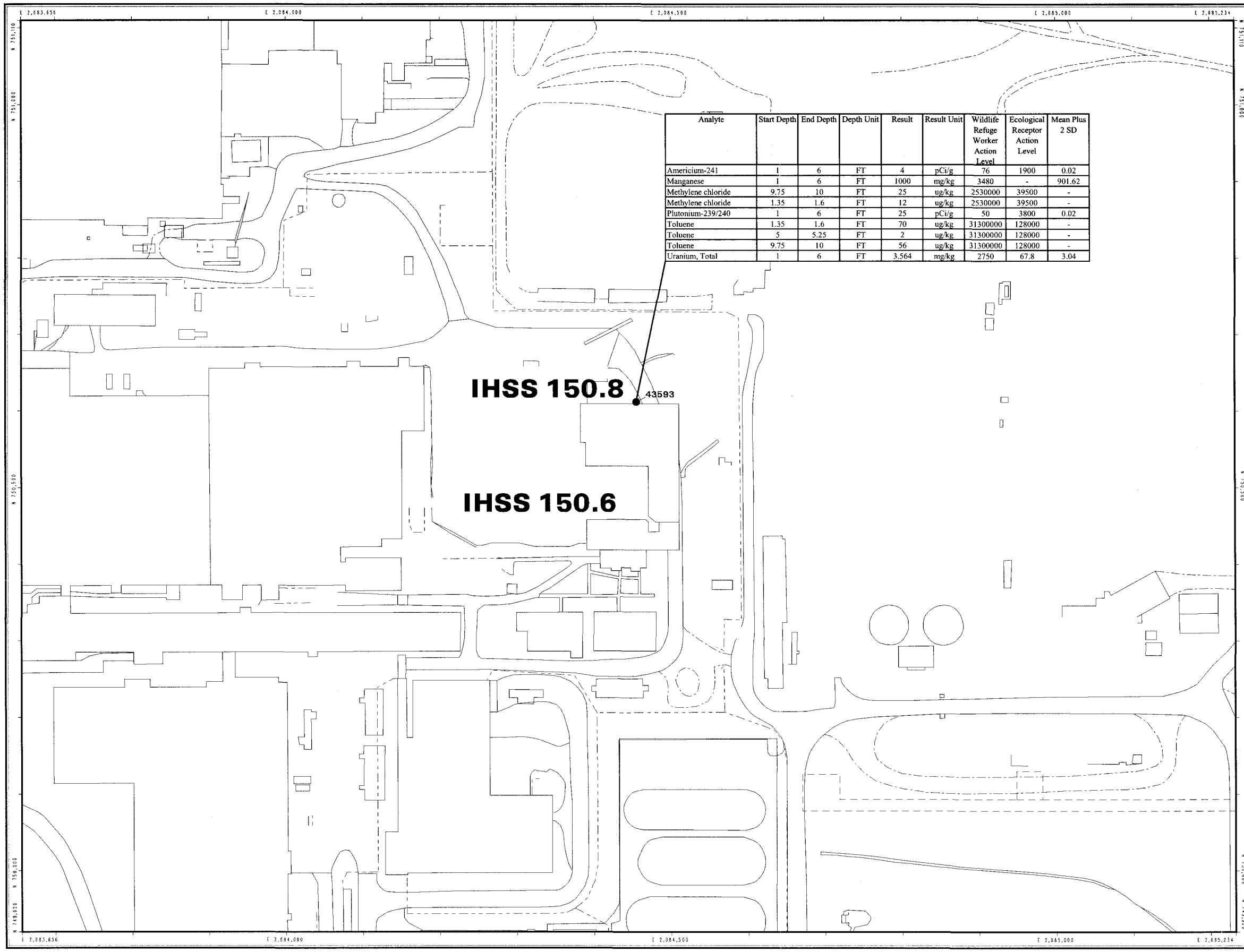

Analyte	Start Depth	End Depth	Depth Unit	Result	Result Unit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
Americium-241	1	6	FT	4	pCi/g	76	1900	0.02
Manganese	1	6	FT	1000	mg/kg	3480	-	901.62
Methylene chloride	9.75	10	FT	25	ug/kg	2530000	39500	-
Methylene chloride	1.35	1.6	FT	12	ug/kg	2530000	39500	-
Plutonium-239/240	1	6	FT	25	pCi/g	50	3800	0.02
Toluene	1.35	1.6	FT	70	ug/kg	31300000	128000	-
Toluene	5	5.25	FT	2	ug/kg	31300000	128000	-
Toluene	9.75	10	FT	56	ug/kg	31300000	128000	-
Uranium, Total	1	6	FT	3.564	mg/kg	2750	67.8	3.04

Figure 5

IHSS 150.6 & 150.8 Subsurface Soil Contaminant Distribution

EXPLANATION

IHSS 150.6
IHSS 150.8

Sample Location

Standard Map Features

Buildings and other structures

Lakes and ponds

Streams, ditches, or other drainage features

Fences and other barriers

Paved roads

Dirt roads

DATA SOURCE BASE FEATURES:
PACs
Historical Release Report (HRR)
2nd Annual Update
Sept. 30, 1997
Individual Hazardous Substance Sites (IHSS)
DOE, 1992, HRR Report and Subsequent Updates.
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas.
Digitized from the orthophotographs. 1/95

Scale = 1 : 1540
1 inch represents approximately 128 feet

50 0 100 200ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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GIS Dept. 303-966-7707

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September 17, 2003

NT_Svr w:/projects/fy2003/03-0544/ihss_150_15_subsoil_cont_dist.aml

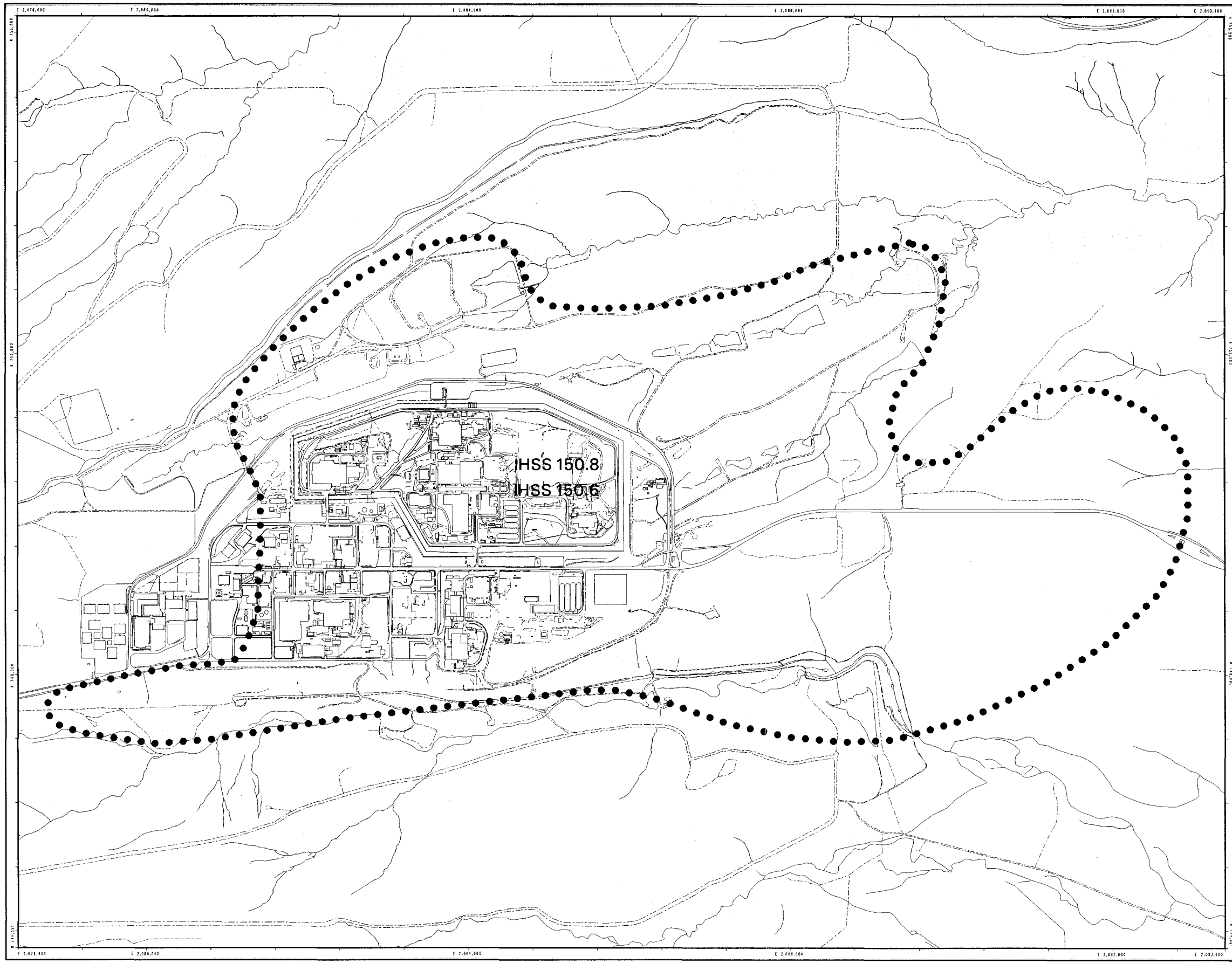

Figure 6

Area of Landslides and High Erosion Potential

EXPLANATION

IHSS Boundary

Areas of landslides and high erosion. Contaminated sites within these areas must be evaluated per Risk Screen 2 of *Figure 3*.

The anticipated boundary of areas that will be subject to institutional controls is subject to modification based upon characterization, future response actions, the results of the comprehensive risk assessment, and the final remedial/corrective action decision in the final CAD/ROD. See Section 1.2.

Standard Map Features

Buildings and other structures

Lakes and ponds

Streams, ditches, or other drainage features

Fences and other barriers

Paved roads

Dirt roads

NOTES:

References:

1. Report on Soil Erosion and Surface Water Sediment Transport Modeling for the Actinide Migration Evaluation at the Rocky Flats Environmental Technology Site (August 2000)
2. Geologic Mapping: Shroba, R.R., and Carrara, P.E. Preliminary Surficial Geologic Map of the Rocky Flats Plant and Vicinity, Jefferson and Boulder Counties, Colorado: U.S. Geological Survey Open-File Report 94-162, Scale 1:6000
   Site source of topo base; see OFR 94-162 (on map)

Scale = 1 : 14990
1 inch represents approximately 1249 feet

250 0 500 1000 ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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September 17, 2003

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Figure 7
Composite VOC Groundwater Plume

EXPLANATION

IHSS Boundary

Collection System

2nd Quarter 2001 Data
Water Level Contour
(20' Interval)

Dashed where inferred

Current Composite Plume Key

Composite VOC Groundwater Plume
(100 X MCL)

Composite VOC Groundwater Plume
(concentration equal to MCL)

Isolated occurrence of VOC exceeding
Tier II Action Levels (1998-2002 Data)

VOC Plume Extent (1998-2002 Data)
(Dashed where inferred)

Historic Composite Plume Key

1997 Composite VOC Groundwater Plume
(100 X MCL)

1997 Composite VOC Groundwater Plume
(concentration equal to MCL)

Standard Map Features

Buildings and other structures

Demolished buildings and
Other Structures

Lakes and ponds

Streams, ditches, or other
drainage features

Fences and other barriers

Roads

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial base data captured by EG&G RSL Las Vegas.
Digitized from the orthophotographs. USGS

NOTES:

Scale = 1 : 2830
1 inch represents approximately 236 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum : NAD27

U.S. Department of Energy

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September 17, 2003

NT_Svr w:/projects/fy2003/03-0544/ihss_150_f7_plume.aml

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