DRAFT ENVIRONMENTAL RESTORATION
RFCA STANDARD OPERATING PROTOCOL
FOR ROUTINE SOIL REMEDIATION
FY02 NOTIFICATION #02-09
IHSS GROUP 900-11
IHSS 112 – 903 PAD

August 2002

TABLE OF CONTENTS

1.0 INTRODUCTION 1
2.0 IHSS GROUP 900-11 1
2.1 Contaminants of Concern 1
2.2 Project Conditions 6
2.3 Remediation Plan 6
2.4 Soil Removal Alternatives 12
2.5 Stewardship Evaluation 17
2.5.1 Proximity to Other Contaminant Areas 17
2.5.2 Surface Water Protection 19
2.5.3 Monitoring 20
2.5.4 Stewardship Actions and Recommendations 21
2.6 Accelerated Action Remediation Goals 23
2.7 Treatment 23
2.8 Confirmation Sampling 23
2.9 Project-Specific Monitoring 23
2.10 Resource Conservation and Recovery Act Units and Intended Waste Disposition 24
2.11 Administrative Record Documents 24
2.12 Projected Schedule 25
3.0 PUBLIC PARTICIPATION 25
4.0 REFERENCES 25

LIST OF FIGURES

Figure 1 ER RSOP Notification #02-09 IHSS Group Location Map 2
Figure 2 Native Soil Horizon 1 Approximately 0-6" Existing Sampling Data Greater Than Background Plus 2 Standard Deviations 3
Figure 3 Native Soil Horizon 2 Approximately 6-12" Existing Sampling Data Greater Than Background Plus 2 Standard Deviations 4
Figure 4 Native Soil Horizon 3 Approximately 12-18" Existing Sampling Data Greater Than Background Plus 2 Standard Deviations 5
Figure 5 Native Soil Horizon 1 RFCA Tier I and Tier II SOR Exceedances 7
Figure 6 Native Soil Horizon 2 RFCA Tier I and Tier II SOR Exceedances 8
Figure 7 Native Soil Horizon 3 RFCA Tier I and Tier II SOR Exceedances 9
Figure 8 903 Pad Subsurface Cross Section 10
Figure 9 IHSS Group 900-11 IHSS 112 – 903 Pad Potential Remediation Area 18
Figure 10 IHSS Group 900-11 IHSS 112 – 903 Pad Well Locations 22

LIST OF TABLES

Table 1 Alternative Analysis 13
Table 2 Other Potential Contaminant Sources for IHSS Group 900-11, IHSS 112 – 903 Pad 17
Table 3 Surface and Near-Surface Soil Characterization Summary 19
Table 4 Surface Water Results From GS39 20
Table 5 Groundwater Exceedances Associated With IHSS Group 900-11, IHSS 112-903 Pad 20

ACRONYMS

AL	action level
ALARA	as low as reasonable achievable
ARAR	Applicable or Relevant and Appropriate Requirement
BMP	best management practice
BZ	Buffer Zone
BZSAP	Buffer Zone Sampling and Analysis Plan
CCR	Code of Colorado Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CHWA	Colorado Hazardous Waste Act
COC	contaminant of concern
cy	cubic yard
D&D	Decontamination and Decommissioning
ER	Environmental Restoration
ER RSOP	Environmental Restoration RSOP for Routine Soil Remediation
FY	Fiscal Year
IHSS	Individual Hazardous Substance Site
IM/IRA	Interim Measure/Interim Remedial Action
IMP	Integrated Monitoring Plan
K-H	Kaiser-Hill Company, L.L.C.
LDR	Land Disposal Restriction
LLMW	low-level mixed waste
LLW	low-level waste
PAC	Potential Area of Concern
pCi/g	picocuries per gram
pCi/L	picocuries per liter
PCOC	potential contaminant of concern
POC	Point of Compliance
POE	Point of Evaluation
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RSOP	RFCA Standard Operating Protocol
SOR	sum of ratios
SVOC	semivolatile organic compound
υg/kg	microgram per kilogram
VOC	volatile organic compound

1.0 INTRODUCTION

This Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) (DOE et al, 1996) Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP) (DOE 2002a) Fiscal Year (FY) 02 Notification includes the notification to remediate Individual Hazardous Substance Sites (IHSSs) and Potential Areas of Concern (PACs) at the Rocky Flats Environmental Technology Site (RFETS) Buffer Zone (BZ) during FY02. Activities specified in the ER RSOP are not reiterated here; however, deviations from the ER RSOP are included where appropriate.

The purpose of this Notification is to invoke the ER RSOP for surface and near surface soil with radionuclide contamination at IHSS Group 900-11, IHSS 112 – 903 Pad. Volatile organic compounds (VOCs) present in subsurface soil in the 903 Pad Area will be addressed through the 903 Lip Area Interim Measure/Interim Remedial Action (IM/IRA). It is not anticipated that significant concentrations of VOCs will be encountered with the radionuclide-contaminated soil.

Potential threats to human health and the environment were evaluated using a screening-level risk assessment in accordance with RFCA Attachment 4 (DOE et al. 1996) to determine potential human health and environmental risks posed by release sites. The results of this evaluation indicate certain risks to human health and the environment exist, and that accelerated actions, in accordance with the ER RSOP, may be warranted at these release sites.

Based on analytical data, contaminants of concern (COCs) in native soil at IHSS Group 900-11, IHSS 112 – 903 Pad include radionuclides (plutonium ranging from background to 152,000 picocuries per gram [pCi/g] and americium ranging from background to 31,670 pCi/g) and VOCs (ranging from nondetect to 6,100 micrograms per kilogram [υg/kg]) (DOE 2000a) indicating that an accelerated action under the ER RSOP at IHSS 112 – 903 Pad is warranted.

2.0 IHSS GROUP 900-11

IHSS Group 900-11 includes IHSS 112 – 903 Pad. Its location is shown on Figure 1.

2.1 Contaminants of Concern

COCs at IHSS 112 – 903 Pad were determined based on data collected during previous studies (DOE 1992-2001, DOE 2000a, DOE 2001a). Radionuclides are present in the surface and near surface soil at IHSS 112 – 903 Pad. VOCs are present in the subsurface soil, generally below 3 feet of depth. VOCs are not a COC for this accelerated action, however, if encountered will be evaluated for potential removal.

Figures 2, 3, and 4 present existing surface and subsurface radionuclide analytical results above background plus two standard deviations for existing surface and subsurface soil for Native Soil Horizons 1 (approximately the first 6 inches of native soil beneath the

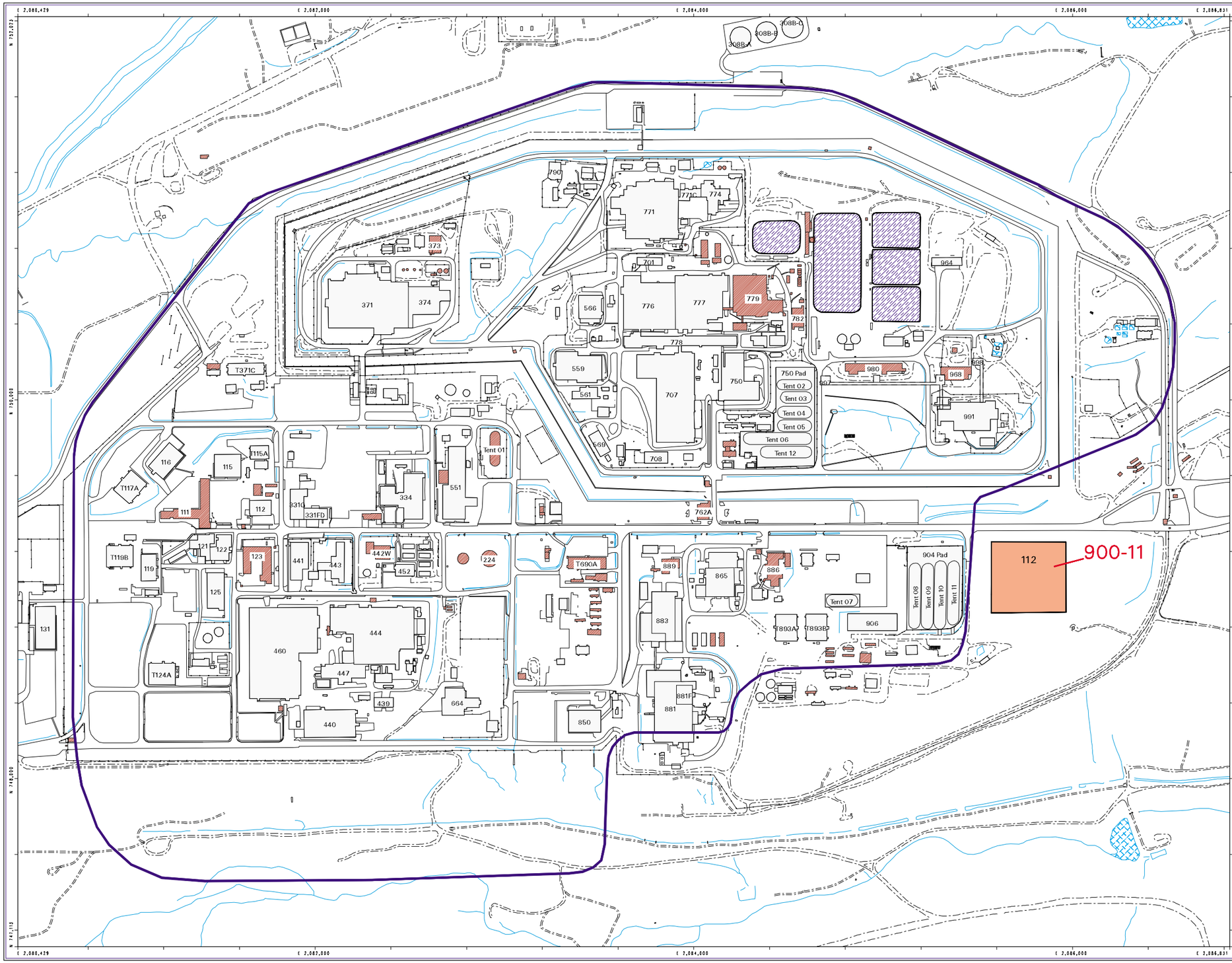


Figure 1

IA Groups Location Map

EXPLANATION

IHSS Groupings

900-11 (only IHSS 112)

Standard Map Features

- Buildings and other structures
- Demolished buildings
- Solar Evaporation Ponds (SEPs)
- 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 E G&G RSL, Las Vegas.
Digitized from the orthophotographs. 1/95

Scale = 1 : 6330
1 inch represents approximately 528 feet

150 0 300 600ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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

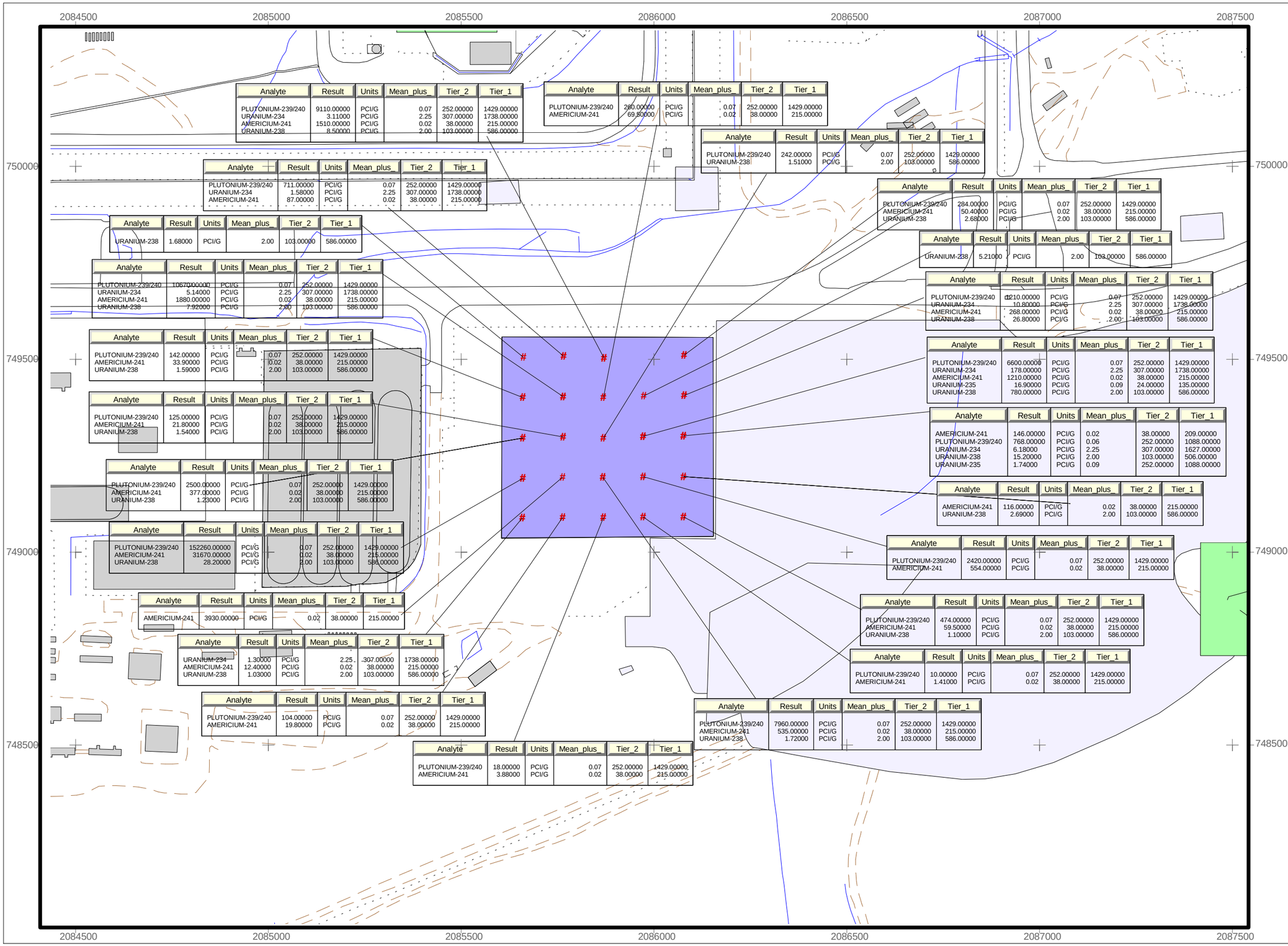
GIS Dept. 303-966-7707

Prepared by: DynCorp THE ART OF TECHNOLOGY

Prepared for: KAISER-HILL COMPANY

June 11, 2002

NT_Svr w:/projects/fy2002/02-0473/ia_group_ihss112.aml



Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	9110.00000	PCI/G	0.07	252.00000	1429.00000
URANIUM-234	3.11000	PCI/G	2.25	307.00000	1738.00000
AMERICIUM-241	1510.00000	PCI/G	0.02	38.00000	215.00000
URANIUM-238	8.50000	PCI/G	2.00	103.00000	586.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	260.00000	PCI/G	0.07	252.00000	1429.00000
AMERICIUM-241	69.60000	PCI/G	0.02	38.00000	215.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	242.00000	PCI/G	0.07	252.00000	1429.00000
URANIUM-238	1.51000	PCI/G	2.00	103.00000	586.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	711.00000	PCI/G	0.07	252.00000	1429.00000
URANIUM-234	1.58000	PCI/G	2.25	307.00000	1738.00000
AMERICIUM-241	87.00000	PCI/G	0.02	38.00000	215.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
URANIUM-238	1.68000	PCI/G	2.00	103.00000	586.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	1067000000	PCI/G	0.07	252.00000	1429.00000
URANIUM-234	5.14000	PCI/G	2.25	307.00000	1738.00000
AMERICIUM-241	1880.00000	PCI/G	0.02	38.00000	215.00000
URANIUM-238	7.92000	PCI/G	2.00	103.00000	586.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	142.00000	PCI/G	0.07	252.00000	1429.00000
AMERICIUM-241	33.90000	PCI/G	0.02	38.00000	215.00000
URANIUM-238	1.59000	PCI/G	2.00	103.00000	586.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	125.00000	PCI/G	0.07	252.00000	1429.00000
AMERICIUM-241	21.80000	PCI/G	0.02	38.00000	215.00000
URANIUM-238	1.54000	PCI/G	2.00	103.00000	586.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	2500.00000	PCI/G	0.07	252.00000	1429.00000
AMERICIUM-241	377.00000	PCI/G	0.02	38.00000	215.00000
URANIUM-238	1.23000	PCI/G	2.00	103.00000	586.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	152260.00000	PCI/G	0.07	252.00000	1429.00000
AMERICIUM-241	31670.00000	PCI/G	0.02	38.00000	215.00000
URANIUM-238	28.20000	PCI/G	2.00	103.00000	586.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
AMERICIUM-241	3930.00000	PCI/G	0.02	38.00000	215.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
URANIUM-234	1.30000	PCI/G	2.25	307.00000	1738.00000
AMERICIUM-241	12.40000	PCI/G	0.02	38.00000	215.00000
URANIUM-238	1.03000	PCI/G	2.00	103.00000	586.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	104.00000	PCI/G	0.07	252.00000	1429.00000
AMERICIUM-241	19.80000	PCI/G	0.02	38.00000	215.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	18.00000	PCI/G	0.07	252.00000	1429.00000
AMERICIUM-241	3.88000	PCI/G	0.02	38.00000	215.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	284.00000	PCI/G	0.07	252.00000	1429.00000
AMERICIUM-241	50.40000	PCI/G	0.02	38.00000	215.00000
URANIUM-238	2.68000	PCI/G	2.00	103.00000	586.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
URANIUM-238	5.21000	PCI/G	2.00	103.00000	586.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	1210.00000	PCI/G	0.07	252.00000	1429.00000
URANIUM-234	10.80000	PCI/G	2.25	307.00000	1738.00000
AMERICIUM-241	268.00000	PCI/G	0.02	38.00000	215.00000
URANIUM-238	26.80000	PCI/G	2.00	103.00000	586.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	6600.00000	PCI/G	0.07	252.00000	1429.00000
URANIUM-234	178.00000	PCI/G	2.25	307.00000	1738.00000
AMERICIUM-241	1210.00000	PCI/G	0.02	38.00000	215.00000
URANIUM-235	16.90000	PCI/G	0.09	24.00000	135.00000
URANIUM-238	780.00000	PCI/G	2.00	103.00000	586.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
AMERICIUM-241	146.00000	PCI/G	0.02	38.00000	209.00000
PLUTONIUM-239/240	768.00000	PCI/G	0.06	252.00000	1088.00000
URANIUM-234	6.18000	PCI/G	2.25	307.00000	1627.00000
URANIUM-238	15.20000	PCI/G	2.00	103.00000	506.00000
URANIUM-235	1.74000	PCI/G	0.09	252.00000	1088.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
AMERICIUM-241	116.00000	PCI/G	0.02	38.00000	215.00000
URANIUM-238	2.69000	PCI/G	2.00	103.00000	586.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	2420.00000	PCI/G	0.07	252.00000	1429.00000
AMERICIUM-241	554.00000	PCI/G	0.02	38.00000	215.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	474.00000	PCI/G	0.07	252.00000	1429.00000
AMERICIUM-241	59.50000	PCI/G	0.02	38.00000	215.00000
URANIUM-238	1.10000	PCI/G	2.00	103.00000	586.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	10.00000	PCI/G	0.07	252.00000	1429.00000
AMERICIUM-241	1.41000	PCI/G	0.02	38.00000	215.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	7960.00000	PCI/G	0.07	252.00000	1429.00000
AMERICIUM-241	535.00000	PCI/G	0.02	38.00000	215.00000
URANIUM-238	1.72000	PCI/G	2.00	103.00000	586.00000

Figure 2
Native Soil Horizon 1 Approximately 0-6" Exisiting Sampling Data Greater Than Background Plus 2 Standard Deviations

KEY

- IHSS 112
- IHSS
- PAC
- Building or other structure
- Stream, ditch, or other drainage
- Paved area
- Fence
- Dirt Road
- # Existing Sampling Location

N

Scale =1:2,100

60 0 60 120 180 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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

Prepared by:

KAISER•HILL COMPANY

903padcharacterization.apr

June 2002

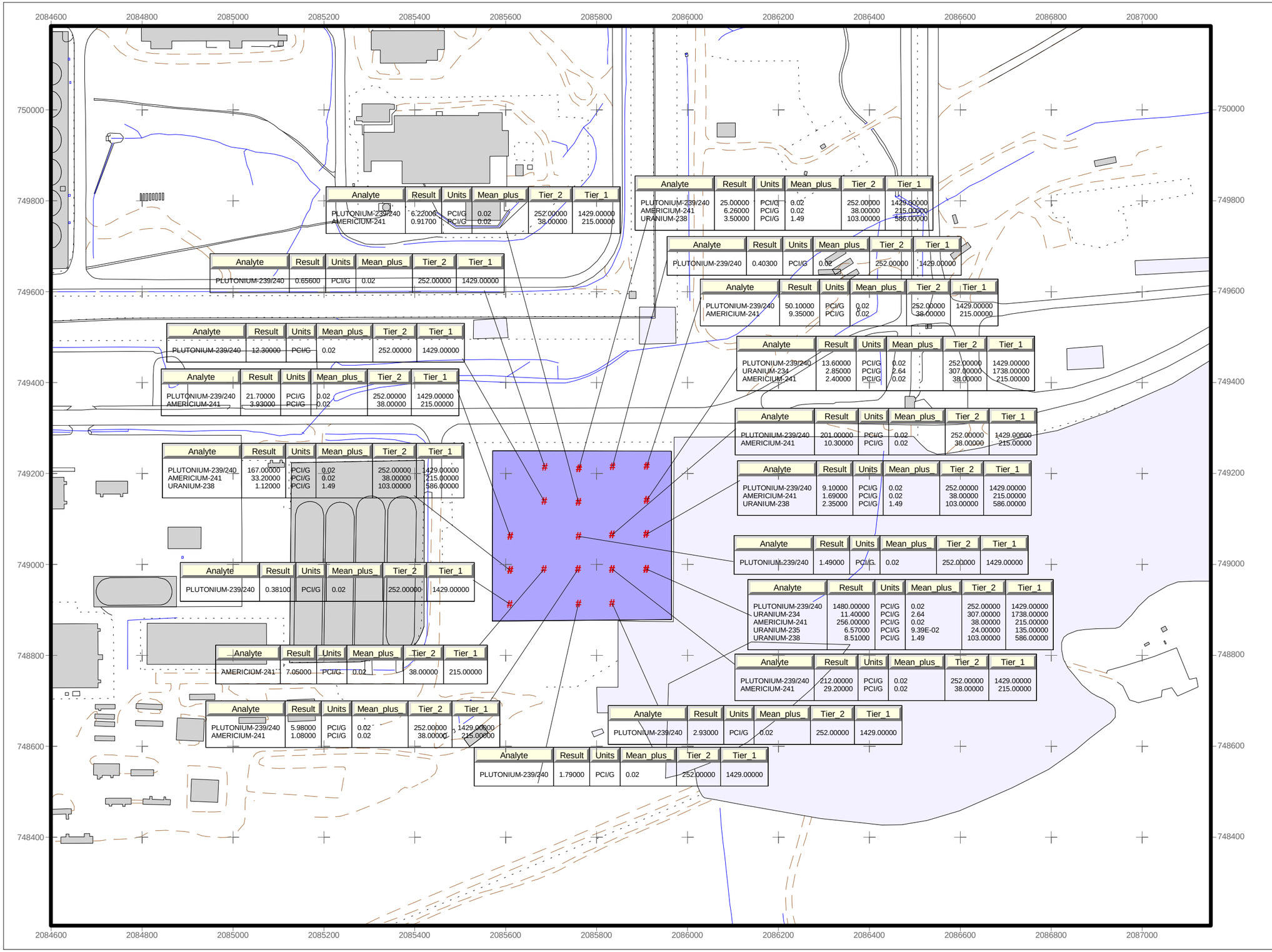


Figure 3
Native Soil Horizon 2
6" - 12"
Exisiting Sampling Data
Greater Than Background
Plus 2 Standard Deviations

KEY

- IHSS 112
- IHSS
- PAC
- Building or other structure
- Stream, ditch, or other drainage
- Paved area
- Fence
- Dirt Road
- # Existing Sampling Location

N

Scale =1:2,500

40 0 40 80 120 160 200 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

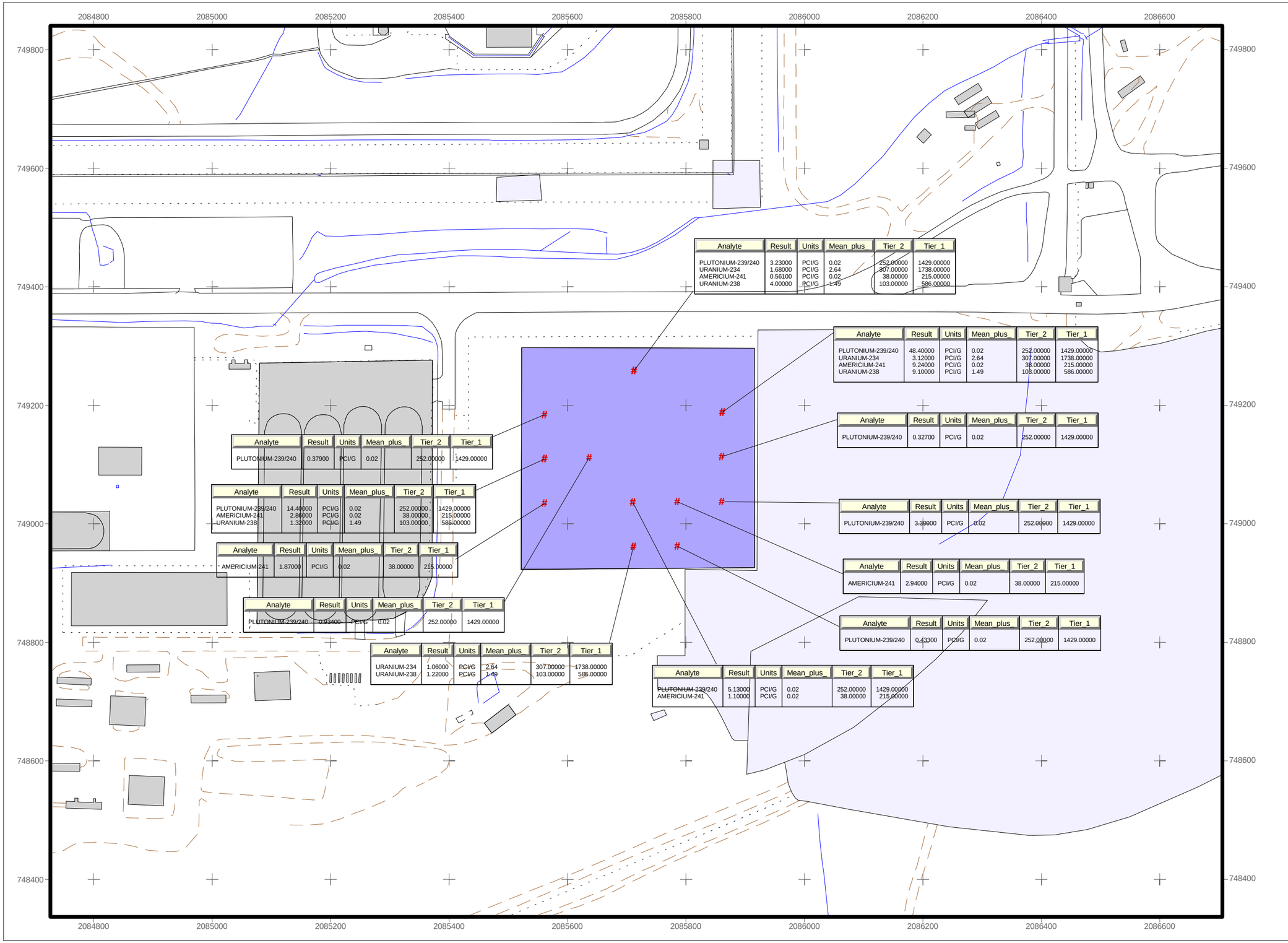
U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:

KAISER-HILL COMPANY

903padcharacterization.apr

June 2002



Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	3.23000	PCI/G	0.02	252.00000	1429.00000
URANIUM-234	1.68000	PCI/G	2.64	307.00000	1738.00000
AMERICIUM-241	0.56100	PCI/G	0.02	38.00000	215.00000
URANIUM-238	4.00000	PCI/G	1.49	103.00000	586.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	48.40000	PCI/G	0.02	252.00000	1429.00000
URANIUM-234	3.12000	PCI/G	2.64	307.00000	1738.00000
AMERICIUM-241	9.24000	PCI/G	0.02	38.00000	215.00000
URANIUM-238	9.10000	PCI/G	1.49	103.00000	586.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	0.37900	PCI/G	0.02	252.00000	1429.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	0.32700	PCI/G	0.02	252.00000	1429.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	14.40000	PCI/G	0.02	252.00000	1429.00000
AMERICIUM-241	2.86000	PCI/G	0.02	38.00000	215.00000
URANIUM-238	1.32000	PCI/G	1.49	103.00000	586.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	3.39000	PCI/G	0.02	252.00000	1429.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
AMERICIUM-241	1.87000	PCI/G	0.02	38.00000	215.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
AMERICIUM-241	2.94000	PCI/G	0.02	38.00000	215.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	0.93400	PCI/G	0.02	252.00000	1429.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	0.43300	PCI/G	0.02	252.00000	1429.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
URANIUM-234	1.06000	PCI/G	2.64	307.00000	1738.00000
URANIUM-238	1.22000	PCI/G	1.49	103.00000	586.00000

Analyte	Result	Units	Mean_plus	Tier_2	Tier_1
PLUTONIUM-239/240	5.13000	PCI/G	0.02	252.00000	1429.00000
AMERICIUM-241	1.10000	PCI/G	0.02	38.00000	215.00000

Figure 4
Native Soil Horizon 3
Appromimately 12" to 18"
Exisiting Sampling Data
Greater Than Background
Plus 2 Standard Deviations

KEY

- IHSS 112
- IHSS
- PAC
- Building or other structure
- Stream, ditch, or other drainage
- Paved area
- Fence
- Dirt Road
- # Existing Sampling Location

N

Scale =1:1900

30 0 30 60 90 120 150 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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

Prepared by:

KAISER-HILL COMPANY

903padcharacterization.apr June 2002

asphalt and artificial fill), 2 (native soil approximately 6 to 12 inches in depth beneath the asphalt and artificial fill), and 3 (native soil approximately 12 to 18 inches in depth beneath the asphalt and artificial fill), respectively. Figures 5, 6, and 7 present the RFCA Tier I and Tier II radionuclide sum of ratios (SORs) for Native Soil Horizons 1, 2, and 3, respectively (DOE 2000a). The depth to the native soil horizons varies because the thickness of the artificial fill varies. Figure 8 presents a sketch of the 903 Pad and subsurface.

VOCs are present in subsurface soil at varying concentrations and depths and are dispersed throughout the soil column, from 5 to 20 feet in depth. Methylene chloride is present sporadically in concentrations greater than the RFCA Tier I Action Level (AL). The concentration of methylene chloride generally increases with depth, however it is not present continuously throughout the soil column. Tetrachloroethene is present in concentrations greater than RFCA Tier I ALs at one location where methylene chloride is also present (DOE 2000a). Methylene chloride, dichloroethene, and trichloroethene are present in the subsurface, but carbon tetrachloride, which was present in drums stored at the 903 Pad, has not been detected. The highest concentrations of VOCs are below the water table and may be at the bedrock contact.

2.2 Project Conditions

The following conditions are present at this site:

- The 903 Pad is 3.4 acres in size;
- An asphalt pad (approximately 6 inches) covers the site;
- A layer of artificial fill (approximately 6 inches to the gravel base) is beneath the asphalt pad;
- Radionuclides are present in the surface and shallow subsurface soil; and
- VOCs are present, sporadically, in the subsurface soil.

2.3 Remediation Plan

In accordance with the ER RSOP, removal of soil with contaminant concentrations greater than RFCA Tier I ALs, by removing the depth of soil described herein, is required. Additionally, soil with contaminant concentrations between RFCA Tier I and Tier II ALs requires evaluation to determine whether action to remove or manage the soil is indicated.

The existing sampling data (Figures 2 through 7) indicate that all significant radionuclide contamination is within the top 12 inches of native soil with varying levels and depths. Results from all of the 25 sampling locations indicate that the maximum plutonium radionuclide activity at depths greater than 12 inches of native soil is 48 pCi/g and is likely in the top of Native Soil Horizon 3. Therefore, using mechanical excavation

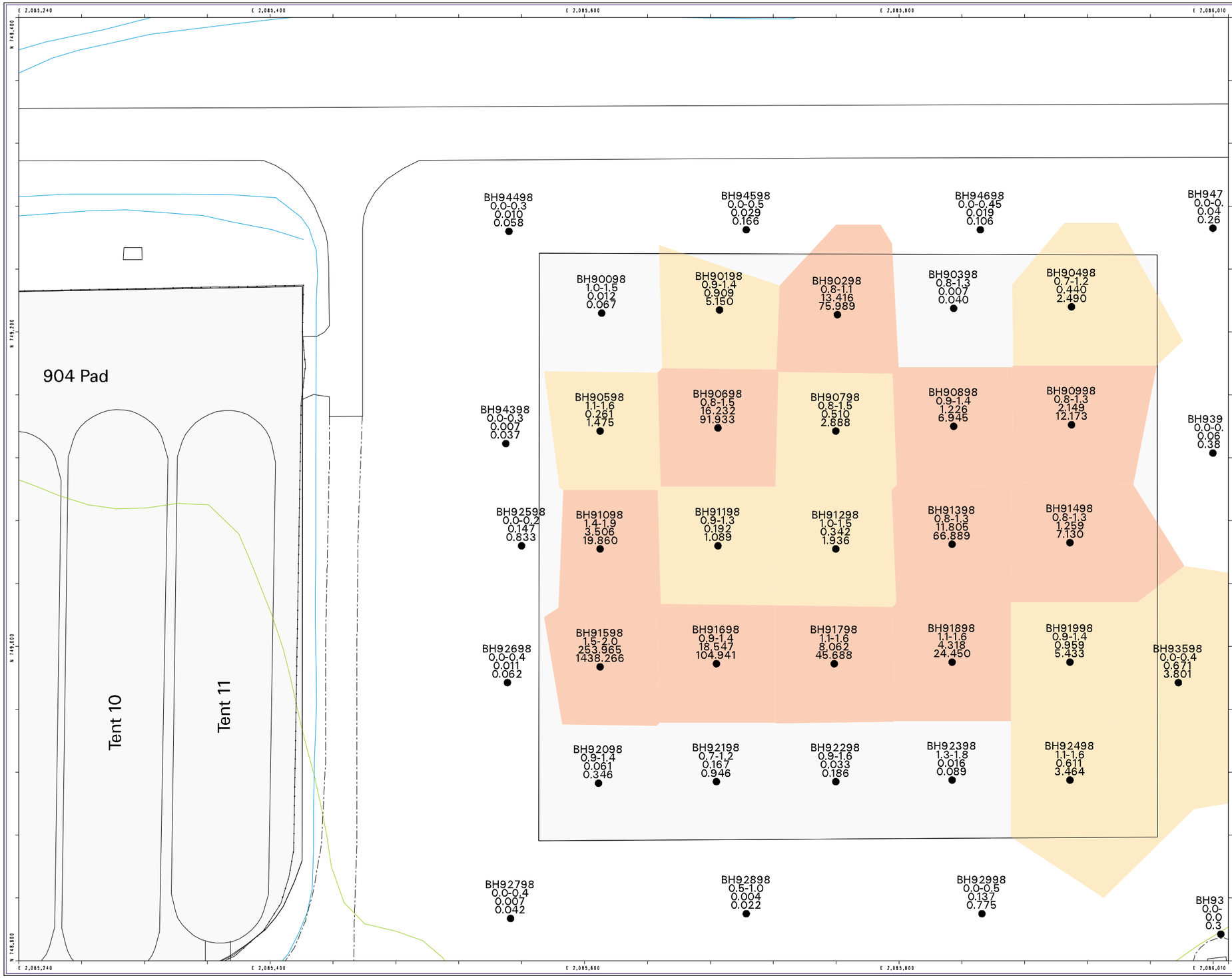


Figure 5

Native Soil Horizon 1

RFCA Tier I and Tier II Sum of Ratio Exceedances

EXPLANATION

Boreholes locations

- Location
  Sample Depth (ft.)
  Tier I Sum of Ratio
  Tier II Sum of Ratio
- Exceed Tier I
- Exceed Tier II

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences and other barriers
- Topographic Contour (20-Foot)
- Paved roads
- Dirt roads

DATA SOURCE BASE FEATURES:
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
Topographic contours were derived from digital elevation model (DEM) data by Morrison Knudson (MK) using ESRI Arc TIN and LATTICE to process the DEM data to create 5-foot contours. The DEM data was captured by the Remote Sensing Lab, Las Vegas, NV, 1994 Aerial Flyover at ~10 meter resolution. DEM post processing performed by MK, Winter 1997.

DISCLAIMER:
Neither the United States Government nor Kaiser Hill Co., nor DynCorp I&ET, nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.

Scale = 1 : 770
1 inch represents approximately 64 feet

20 0 40 80 ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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

GIS Dept. 303-966-7707

Prepared by: DynCorp THE ART OF TECHNOLOGY

Prepared for: KAISER-HILL COMPANY

June 27, 2002

Original map contents are preserved. Logo and date have changed.

NT_Svr w:/projects/fy2002/02-0688/hpge-903pad_thes1a.aml

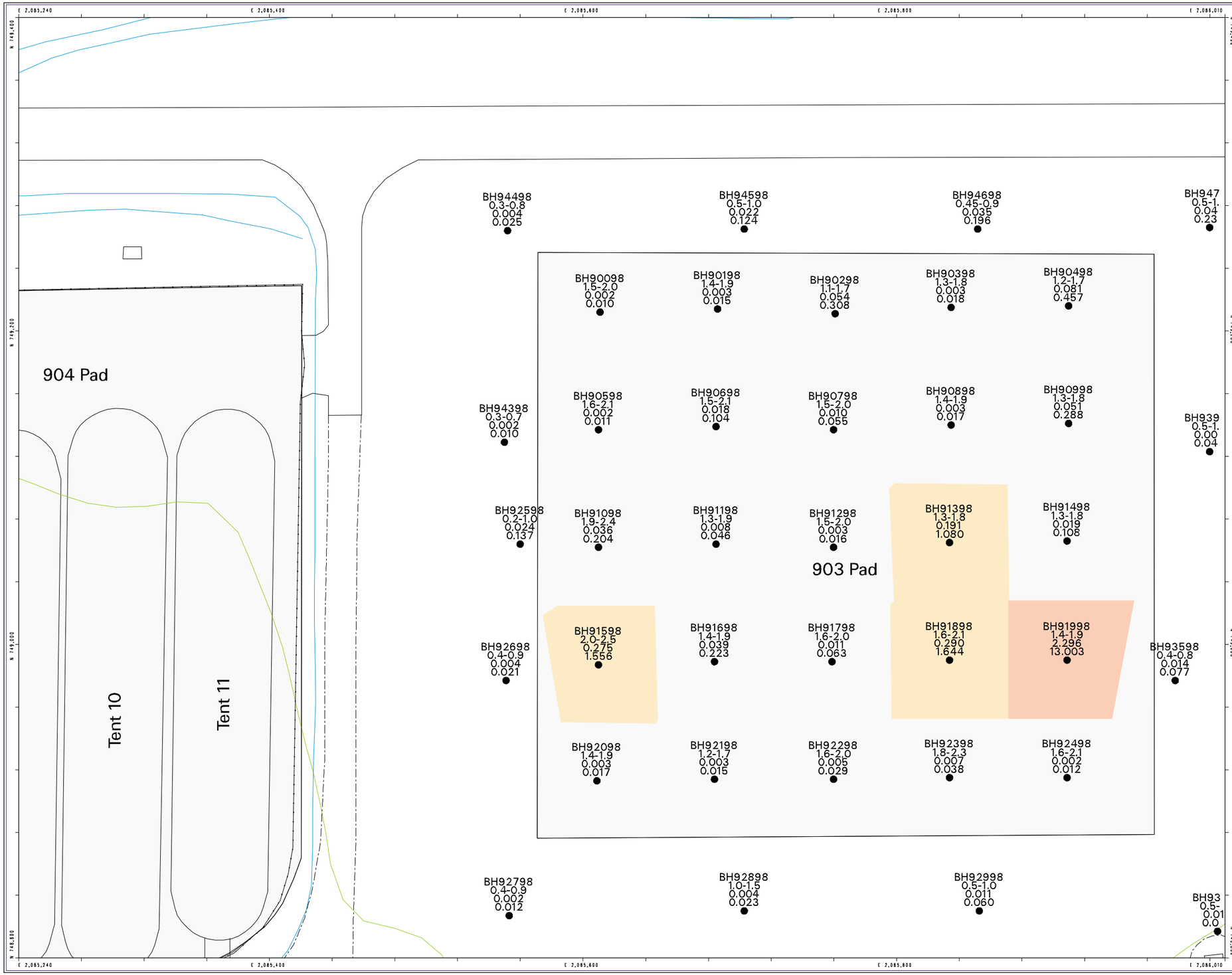


Figure 6

Native Soil Horizon 2

RFCA Tier I and Tier II Sum of Ratio Exceedances

EXPLANATION

Boreholes locations

- Location
  Sample Depth (ft.)
  Tier I Sum of Ratio
  Tier II Sum of Ratio
- Exceed Tier I
- Exceed Tier II

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences and other barriers
- Topographic Contour (20-Foot)
- Paved roads
- Dirt roads

DATA SOURCE BASE FEATURES:
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
Topographic contours were derived from digital elevation model (DEM) data by Morrison Knudson (MK) using ESRI Arc TIN and LATTICE to process the DEM data to create 5-foot contours. The DEM data was captured by the Remote Sensing Lab, Las Vegas, NV, 1994 Aerial Flyover at ~10 meter resolution. DEM post processing performed by MK, Winter 1997.

DISCLAIMER:
Neither the United States Government nor Kaiser Hill Co., nor DynCorp I&ET, nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.

Scale = 1 : 770
1 inch represents approximately 64 feet

20 0 40 80 ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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

GIS Dept. 303-966-7707

Prepared by: DynCorp THE ART OF TECHNOLOGY

Prepared for: KAISER-HILL COMPANY

June 27, 2002

Original map contents are preserved. Logo and date have changed.

NT_Svr w:/projects/fy2002/02-0688/hpge-903pad_thes2a.aml

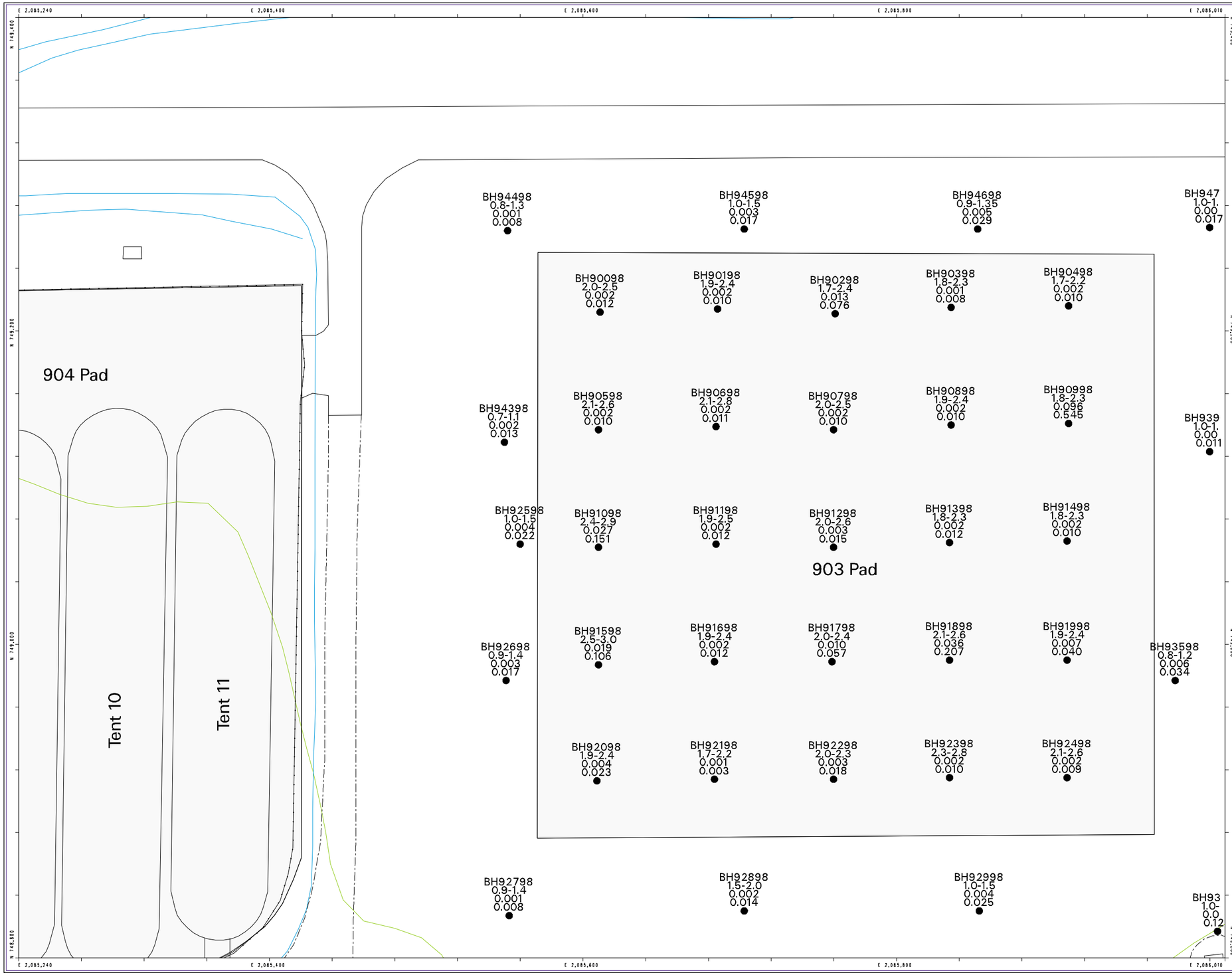


Figure 7

Native Soil Horizon 3

RFCA Tier I and Tier II Sum of Ratio Exceedances

EXPLANATION

Boreholes locations

- Location
  Sample Depth (ft.)
  Tier I Sum of Ratio
  Tier II Sum of Ratio
- Exceed Tier I
- Exceed Tier II

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences and other barriers
- Topographic Contour (20-Foot)
- Paved roads
- Dirt roads

DATA SOURCE BASE FEATURES:
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
Topographic contours were derived from digital elevation model (DEM) data by Morrison Knudson (MK) using ESRI Arc TIN and LATTICE to process the DEM data to create 5-foot contours. The DEM data was captured by the Remote Sensing Lab, Las Vegas, NV, 1994 Aerial Flyover at ~10 meter resolution. DEM post processing performed by MK, Winter 1997.

DISCLAIMER:
Neither the United States Government nor Kaiser Hill Co., nor DynCorp I&ET, nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.

Scale = 1 : 770
1 inch represents approximately 64 feet

20 0 40 80 ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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

GIS Dept. 303-966-7707

Prepared by: DynCorp — THE ART OF TECHNOLOGY

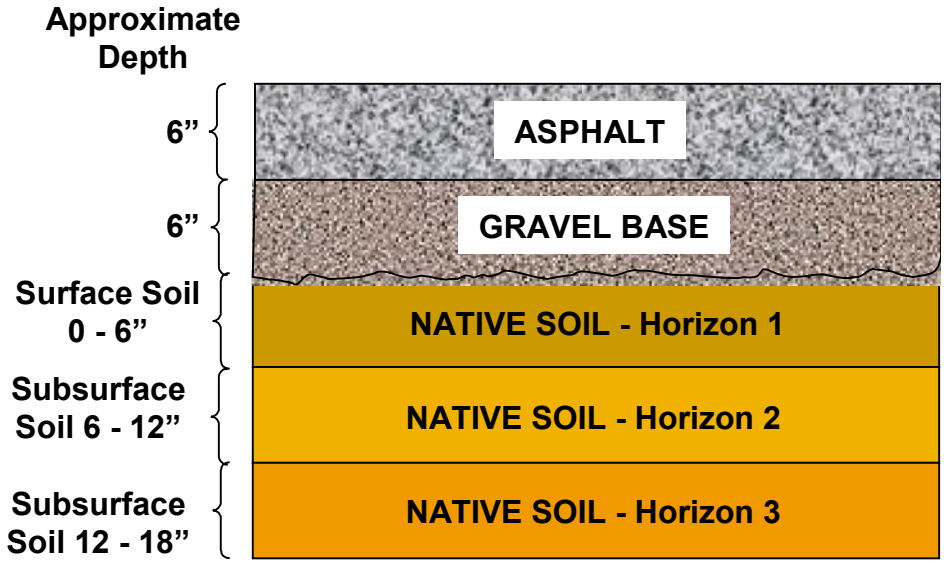
Prepared for: KAISER-HILL COMPANY

June 27, 2002

Original map contents are preserved. Logo and date have changed.

NT_Svr w:/projects/fy2002/02-0688/hpge-903pad_thes3a.aml

Figure 8
903 Pad Subsurface Cross Section



equipment, the top 12 inches of native soil below the footprint of the pad will be removed (Figures 5 and 6 [DOE 2000a]). As a result of this action, it is anticipated that residual radioactivity in soil will be well below Tier II ALs and even approaching background levels (Figure 7 [DOE 2000a]). After the top 12 inches of native soil are removed, if the Tier I SOR is greater than 1 in underlying soil, an additional approximate 6-inch lift of native soil will be removed. After soil with Tier I SORs greater than 1 is removed, the stewardship and as low as reasonably achievable (ALARA) evaluations will be conducted, using the consultative process with the regulatory agencies, to determine whether additional excavation is required.

Soil excavation will be conducted within a 90-foot x 110-foot tent that will be used to protect the excavation from weather conditions and to mitigate possible weather-related delays. Within the tent, the excavation area will be approximately 80 feet x 90 feet. Subareas will be established on a grid within the tent based on the reach of the excavating equipment and tent logistics. It is anticipated that there will be nine or sixteen subareas to a tent. As excavation in the tent progresses, confirmation samples will be collected from the approximate middle of each subarea. Upon receipt of in-process sample results, using gamma spectroscopy methods, the decision will be made (through the consultative process) to either remove another 6-inch lift of soil to achieve remediation goals, or to proceed with the backfill process. When excavation and backfill activities within the tent are complete, the tent will be moved to the adjacent excavation area. It is anticipated that the tent will be moved 20 times over the 903 Pad area.

Removal of deeper VOC-contaminated subsurface soils is not being proposed at this time and will be addressed through the 903 Lip Area IM/IRA because of the following reasons.

- The highest concentrations of VOCs are at or near the bedrock surface. Excavation of scattered VOC-contaminated soil pockets at this depth is impractical because VOCs tend to be mobilized by excavation, which may result in incomplete removal.
- Stringent radiological work controls will be in place during the 903 Pad radiological accelerated action. Because the highest concentrations of VOCs are at or near the bedrock surface, large or deep excavations would be required. Deep excavation of VOC-only contaminated soil would not be practical or cost effective under stringent radiological work controls.
- Groundwater from the 903 Pad area is captured on the north by the Mound and East Trenches barrier and treatment systems. Current data do not indicate that there is a pathway from groundwater to surface water on the south. Consequently, VOC source removal may not be necessary.
- VOC-contaminated subsurface soil can be properly evaluated and addressed comprehensively over the 903 Pad and Lip areas in the IM/IRA in conjunction with evaluation of groundwater and potential surface water impacts.
- There is no in-situ treatment option for 903 Pad soil contaminated with plutonium and americium but, in-situ VOC treatment options (for example, application of

compounds that accelerate degredation) may provide equivalent or better reduction in VOC concentrations with less risk to workers.

- Excavation of VOC-contaminated soil may result in generation of low-level mixed waste (LLMW), which would likely require treatment to meet disposal facility requirements. This is not considered a cost-effective action.

Based on existing data, it is not anticipated that VOC-contaminated soil will be encountered during this accelerated action. Six waste characterization grab samples were collected over the 903 Pad footprint, at a depth of one foot, at locations biased towards elevated analytical results or field indicators. All results are significantly below RFCA Tier I ALs and the soil is Land Disposal Restriction (LDR) compliant. However, if VOC-stained soil is encountered, the consultative process will be used to determine if, and to what extent, VOC-contaminated soil will be removed at this time. If VOCs are found within the top 12 inches of soil, the VOC-contaminated soil will be segregated for waste disposal.

The proposed action for IHSS 112 – 903 Pad includes the following:

- Remove asphalt and dispose as low-level waste (LLW) (approximately 2,743 cubic yards [cy]);
- Remove artificial fill to the base of the gravel (approximately 3,429 cy) and dispose as appropriate, pending waste characterization;
- Remove the top 1 foot of native soil at the 903 Pad (approximately 6,858 cy) and additional soil as necessary to removal all soil with contaminant concentrations greater than RFCA Tier I ALs and as indicated by ALARA and stewardship evaluations, and dispose as appropriate, pending waste characterization;
- Collect confirmation samples in accordance with the Buffer Zone Sampling and Analysis Plan (BZSAP [DOE 2002b]) (Section 4.5); and
- Backfill with clean soil, regrade, and revegetate.

2.4 Soil Removal Alternatives

Three alternatives were evaluated for the 903 Pad Area: removal of approximately one foot of soil below the asphalt and artificial fill, stabilization/capping, and no action. These alternatives were compared against three evaluation criteria: effectiveness, implementability, and relative cost in accordance with RFCA Appendix 3, Implementation Guidance Document (DOE, et al. 1999). Stewardship impacts have also been included in the evaluation. The results of this evaluation are summarized in Table 1.

Table 1
Alternative Analysis

Alternative Description	Effectiveness	Implementability	Relative Cost	Stewardship Impacts
Alternative 1 Removal of one foot of soil across the 903 Pad Area and disposal offsite.	In the short-term, there may be adverse impacts to surface water quality, an increase in fugitive dust emissions, and transportation of radioactive material. Approximately 398 shipments of LLW are anticipated (See Section 13.0 of the ER RSOP). Potential impacts to water and air are temporary and controllable with mitigation measures as described in the Remediation Plan (Section 2.3). This alternative will be protective of public health and the environment in the long-term because removal of one foot of soil across the 903 Pad Area will result in residual contamination less than 50 pCi/g in all sections and close to background values in most sections of the 903 Pad Area. This alternative will achieve Applicable or Relevant and Appropriate Requirements (ARARs) including the following: – National Emission Standards	This alternative is technically feasible because removal would be implemented using standard construction equipment and would be staged in a weather protective tent. The tent will also provide mitigation measures for potential impacts to air and water quality. Offsite facilities exist for the disposal of the radioactive waste that will be excavated during the action. This alternative is believed to be acceptable to the State and local communities.	Approximately $9,446,000	Removal could result in the following: – Decreased impacts to surface water from runoff, – Decreased monitoring requirements, and – Potential removal of institutional controls.

Alternative Description	Effectiveness	Implementability	Relative Cost	Stewardship Impacts
	for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities (40 Code of Federal Regulations [CFR] 61, subpart H), – Solid Waste Disposal Act (Resource Conservation and Recovery Act [RCRA]) Colorado Hazardous Waste Act (CHWA) (6 Code of Colorado Regulations [CCR] 1007-2), and – Radiation Control (6 CCR 1007-1). Toxicity and mobility will be reduced because radionuclide contaminated soil will be removed.			
Alternative 2 Stabilization/Capping	In the short term, there may be adverse impacts to surface water quality and an increase in fugitive dust emissions during stabilization and cap construction. This alternative will be protective of public health and the environment because stabilization will reduce surface soil dispersion and surface water runoff. Long-term effectiveness will require institutional controls. This alternative will achieve ARARs	This alternative is technically feasible because the cap construction uses standard construction and earth moving equipment. Stabilization would be conducted using common mixing equipment such as mixing injectors, rippers, disk harrows. While technically feasible, this alternative	Costs for this alternative are likely to be less than Alternative 1 in the near term. However, this remedy is less effective than Alternative 1 and will require additional long-term	Stabilization/Capping could result in the following: – Increased monitoring requirements including either additional monitoring stations or longer term monitoring, – Increased long-term stewardship costs, and – Long-term institutional controls.

Alternative Description	Effectiveness	Implementability	Relative Cost	Stewardship Impacts
	including the following: – National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities (40 CFR 61, subpart H), – Solid Waste Disposal Act (RCRA) Colorado Hazardous Waste Act (CHWA) (6 CCR 1007-2), and – Radiation Control (6 CCR 1007-1). Mobility will be decreased because surface soil dispersion via wind erosion and surface water runoff will be reduced. The cap will reduce the migration of contaminants into subsurface soils by reducing the infiltration of surface water and directing surface water runoff away from the area. Stabilization will reduce contaminant mobility by reducing the potential for these contaminants to migrate as dust, become entrained with surface water runoff, or infiltrate further into subsurface soils.	would result in additional institutional controls for the 903 Pad Area and increased monitoring either through additional monitoring stations or longer-term monitoring. While this alternative could be implemented, it will not be consistent with the comprehensive final remedy for radionuclides in near surface soil at the Site or the likely removal action for surface soils in the 903 Lip Area. Stabilization additives and capping materials would likely increase the amount of soil that would require remediation in the future. Also, as presented in the VOC discussion (Section 2.3), the presence of radionuclides at current concentrations would be expected to complicate a response to the VOC plume. This alternative is not	stewardship costs.	

Alternative Description	Effectiveness	Implementability	Relative Cost	Stewardship Impacts
		acceptable to the State or local communities.		
Alternative 3 No action	In the short-term there would be no increased adverse impact to water quality, fugitive dust emissions, or transportation of radioactive material since the soil in the 903 Pad would not be disturbed. However, this alternative is not effective for overall protection of public health and the environment in the long-term, nor would ARARs be achieved, since "no action" will result in soil with radionuclide contaminant concentrations greater than Tier I ALs. Toxicity and mobility would not be reduced.	While technically feasible, no action could result in additional institutional controls for the 903 Pad Area and increased monitoring either through additional monitoring stations or longer-term monitoring. This alternative is not acceptable to the State or local communities.	$0	No action could result in the following: – Increased monitoring requirements including either additional monitoring stations or longer term monitoring, – Increased long-term stewardship costs, and – Long-term institutional controls.

The alternative selected for this accelerated action must be protective of human health and the environment. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) also requires that the selected cleanup alternative comply with ARARs established under federal and state laws, to the extent practicable, or justify a waiver for the requirements. The removal action must be cost effective and utilize technologies that result in a permanent action to the maximum extent possible.

The alternative analysis resulted in an alternative that is effective and implementable under the ER RSOP. The preferred alternative for the 903 Pad area is Alternative 1: removal of one foot of soil across the 903 Pad Area and disposal offsite. Alternative 1, while not the most cost-effective option, provides overall protection of human health and the environment and compliance with ARARs. Alternative 2 also provides overall protection of human health and the environment but will require additional stewardship actions. Alternative 3 does not provide overall protection of human health and the environment. Alternatives 2 and 3 are less acceptable to the community.

2.5 Stewardship Evaluation

Based on the COCs (see Section 2.1) and the ER RSOP (DOE 2002a), it is anticipated that all contamination above RFCA Tier I ALs will be remediated. It is also anticipated that after 1 foot (depth) of soil is removed, most contamination above RFCA Tier II ALs will be remediated. The potential remediation area is shown on Figure 9. Additional remediation to below Tier I ALs is not required by RFCA, but will be evaluated using the consultative process. A map of residual contamination will be generated after remediation. The following sections contain the stewardship evaluation.

2.5.1 Proximity to Other Contaminant Areas

IHSS 112 – 903 Pad is located in the RFETS BZ. Nearby potential contaminant areas include IHSS 155 – 903 Lip Area, which also contains IHSS 140 – Hazardous Disposal Area. These sites, PCOCs, media of interest, proximity, and relationships to IHSS 112 – 903 Pad are listed in Table 2 and shown on Figure 9.

Table 2
Other Potential Contaminant Sources for IHSS Group 900-11, IHSS 112 – 903 Pad

IHSS Group/IHSS	PCOCs/COCs	Media	Distance from IHSS Group 900-11, IHSS 112 – 903 Pad
900-11 – IHSS 155 – 903 Lip Area	Radionuclides VOCs	Surface and Subsurface Soil Subsurface Soil	Adjacent to the east and south
900-11 – IHSS 140 – Hazardous Disposal Area	Metal VOCs	Surface Soil Subsurface Soil	Approximately 128 feet to the southeast

IHSS 155 is the result of erosion and transport action of plutonium by wind and water from IHSS 112 – 903 Pad. IHSS 140 was used for the destruction and disposal of reactive metals and other chemicals such as solvents.

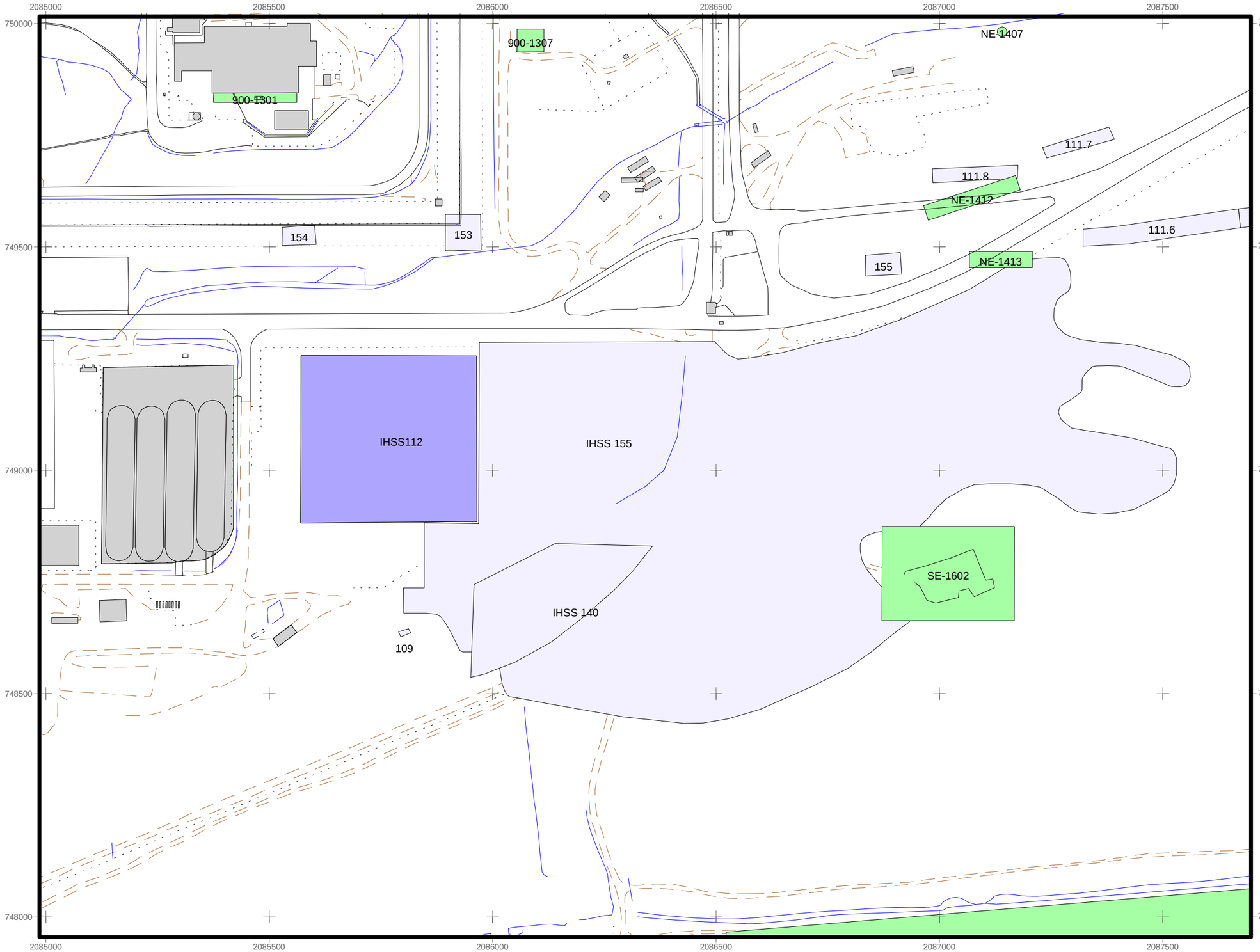


Figure 9
IHSS Group 900-11 IHSS 112
Remediation Area

KEY

- IHSS 112 Remediation Area
- Nearby IHSSs
- PAC
- Stream, ditch, or other drainage
- Paved area
- Fence
- Dirt road

N

Scale = 1:2600

80 0 80 160 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Prepared by:

KAISER•HILL COMPANY

900-112 notification.apr

2.5.2 Surface Water Protection

Surface water protection includes the following considerations:

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

Surface water runoff from the western end of the 903 Pad flows north and then west into the ditch south of Central Avenue where it is sampled at location GS39. Runoff from the northeastern region of the 903 Pad flows east into a small ditch and eventually to a borrow ditch east of the 903 Lip Area. Flow from the borrow ditch is routed through a culvert leading to surface water performance monitoring location SW055. Surface water flows from SW055 toward the SID.

Do characterization data indicate there are contaminants in surface soil?

Table 3 lists radionuclide data (DOE 2000a) from IHSS Group 900-11, IHSS 112 – 903 Pad, along with background values and RFCA ALs for comparison. As shown in this table, americium-241 and plutonium-239/240 activities in surface and near-surface soil are greater than the RFCA Tier I AL. Additionally, uranium-238 activity is greater than RFCA Tier II ALs in surface soil.

Table 3
Surface and Near-Surface Soil Characterization Summary

Analyte	Maximum Result (pCi/g)	Background Plus Two Standard Deviations (pCi/g)	Tier I AL (pCi/g)	Tier II AL (pCi/g)
Americium-241	31,670.00	0.0227	215	38
Plutonium-239/240	152,260.0	0.066	1,429	252
Uranium-233/234	178.0	2.253	1,738	307
Uranium-235	16.9	0.0939	135	24
Uranium-238	780.0	2	586	103

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

There are no POEs or POCs in the vicinity of IHSS 112 – 903 Pad. The closest surface water monitoring station is GS39, which receives runoff from the western end of the 903 Pad (K-H 2001). Monitoring data from GS39 (DOE 1999a, 1999b, 2000b, 2000c, 2000d, 2000e, 2001b, 2001c, 2001d, 2001e, 2002c) are summarized in Table 4. Additional surface water monitoring stations designed to monitor surface water quality in the subbasins draining the 903 Area were installed through the Integrated Monitoring Program (IMP). New surface water stations include SW055, GS52, GS53, and GS54 (K-H 2001). Preliminary results indicate that plutonium-239/240 is present in concentrations of 0.432 picocuries per liter (pCi/L) and americium-241 is present in concentrations of 0.084 pCi/L in surface water at SW055. Results from the other new monitoring stations are not available.

Table 4
Surface Water Results From GS39

Analyte	Maximum Result (pCi/L)	Woman Creek ALs and Standards (pCi/L)	Walnut Creek ALs and Standards (pCi/L)
Americium-241	0.083	0.15	0.15
Plutonium-239/240	0.64	0.15	0.15
Uranium (Total)	2.09	11	10

Is the IHSS Group in an area with high erosion potential, based on the 100-Year Average Erosion Map?

While most of the 903 Pad area is flat lying, the southeastern portion of IHSS 112 – 903 Pad, is shown on the 100-Year Average Erosion Map (DOE 2002a) as being in an area subject to approximately 0.018 pounds per square yard of detachment. Erosion in the area (the hill slope including the southeastern corner of the 903 Pad to the South Interceptor Ditch) could average approximately 0.880 tonnes per hectare per year (DOE 2000f). Most of the erosion potential for this area is due to the slope south of the 903 Pad Area. Erosion potential for most of the 903 Pad Area is very low, while erosion potential for the southeastern corner increases slightly.

2.5.3 Monitoring

Monitoring includes the following considerations:

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

Groundwater monitoring results from wells in the 903 Pad area (DOE 1995) indicate that americium-241, plutonium-239/240, uranium-235, and uranium-238 activities are greater than RFCA Tier II ALs, and americium-241 activities are greater than the RFCA Tier I ALs. Table 5 lists the maximum results from IHSS 112 – 903 Pad wells that exceeded RFCA Tier II ALs.

Table 5
Groundwater Exceedances Associated With IHSS Group 900-11, IHSS 112- 903 Pad

Analyte	Maximum Result (pCi/L)	Tier I AL (pCi/L)	Tier II AL (pCi/L)
Americium-241	21.31	14.5	0.145
Plutonium-239/240	0.812	15.1	0.151
Uranium-235	1.5	101	1.01
Uranium-238	75.73	76.8	0.768

Groundwater quality in this area may have been impacted by radionuclide contamination from IHSS 112 – 903 Pad.

Can the impact be traced to a specific IHSS Group?

Radionuclides in groundwater monitoring wells at IHSS 112- 903 Pad are similar to constituents detected above background plus two standard deviations in subsurface soil near these sites.

Are additional monitoring stations needed?

Wells 1587, 1687, 06591, 06691, 06791, 06891, 06991, 07191, 08891, 09091, 13091, 13191, 13291, and 50199 are being removed from the 903 Pad area because they are in, or near, the soil removal area or they will no longer provide relevant information. Well locations are shown on Figure 10. Two new wells, 90402 and 90502, are being added to monitor remediation activities, however, their location has not been finalized. These wells will also be evaluated, after remediation, to determine if they will be needed for long-term monitoring.

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

The monitoring stations will still be needed to detect VOC concentrations in groundwater.

2.5.4 Stewardship Actions and Recommendations

The stewardship actions and recommendations for IHSS 112 – 903 Pad are as follows:

- Use best management practices (BMPs) to control runoff to nearby surface water during remediation, including excavation inside a weather tent.
- Implement near-term institutional controls until final closure and stewardship decisions are implemented, including the following:
  - Signs and barriers;
  - Restrictions on soil excavation; and
  - Soil excavations controlled through the Site Soil Disturbance Permit process.
- Implement long-term stewardship actions, including the following:
  - Federal ownership; and
  - Land use restrictions to prevent soil excavation. Specific land use restrictions will be discussed in the Site Long-Term Stewardship Plan.

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

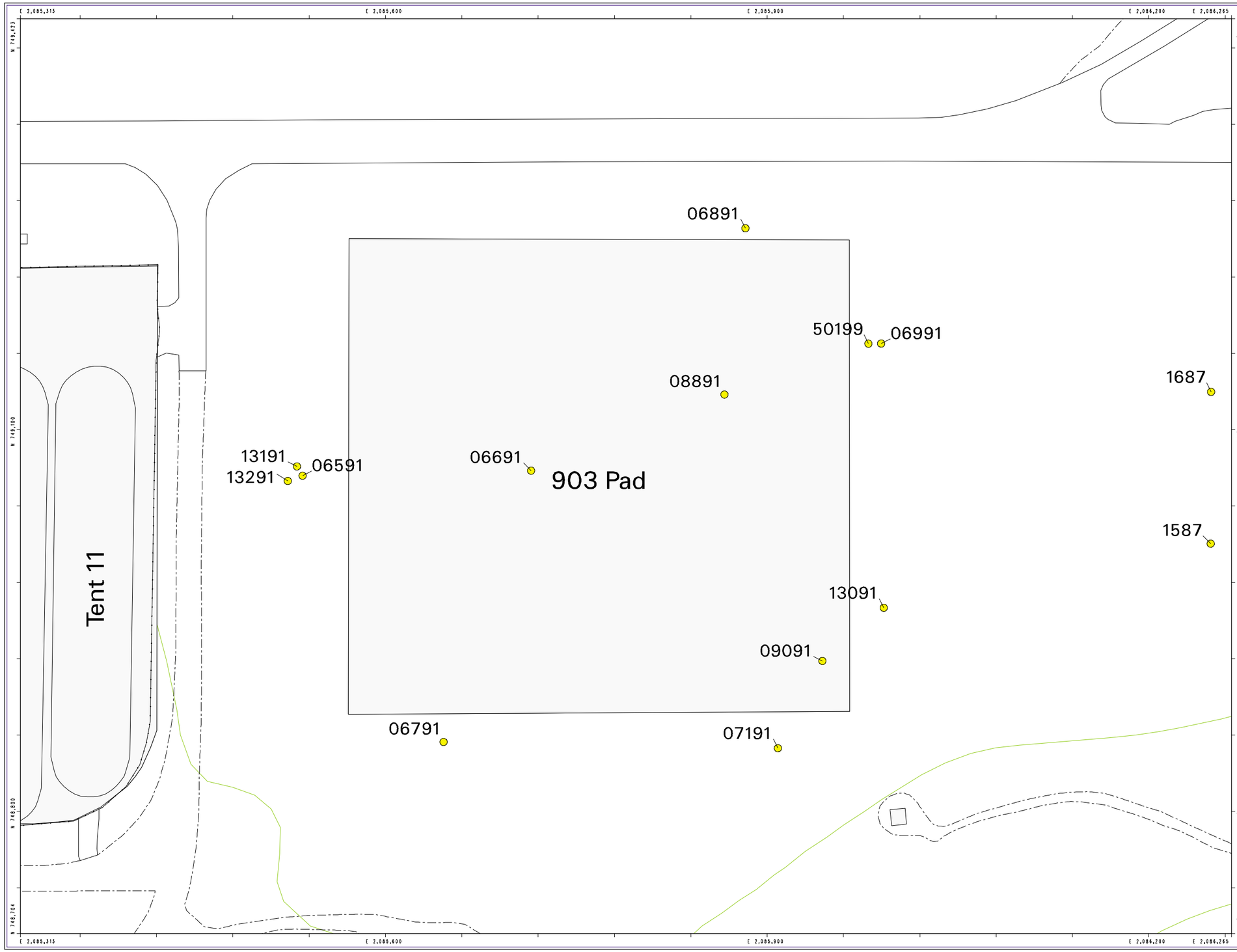


Figure 10

903 Pad Area Wells

EXPLANATION

IMP Wells Removed

Standard Map Features

Buildings and other structures

Fences and other barriers

Topographic Contour (20-Foot)

Paved roads

Dirt roads

DATA SOURCE BASE FEATURES:
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

Topographic contours were derived from digital elevation model (DEM) data by Morrison Knudson (MK) using ESRI Arc TIN and LATTICE to process the DEM data to create 5-foot contours. The DEM data was captured by the Remote Sensing Lab, Las Vegas, NV, 1994 Aerial Flyover at ~ 10 meter resolution. DEM post-processing performed by MK, Winter 1997.

Scale = 1 : 930
1 inch represents approximately 78 feet

25 0 50 100ft

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

August 01, 2002

NT_Svr w:/projects/fy2002/02-0833/pad903_imp_wells.aml

2.6 Accelerated Action Remediation Goals

ER RSOP remedial action objectives include the following:

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

2. Provide a remedy that minimizes the need for long-term maintenance and institutional or engineering controls; and

3. Minimize the spread of contaminants during implementation of accelerated actions.

The accelerated action remediation goals for IHSS 112 – 903 Pad include the following:

- Remove asphalt and dispose as LLW (approximately 2,743 cy);

- Remove artificial fill (approximately 3,429 cy) and dispose as appropriate, pending waste characterization;

- Remove the top 1 foot of native soil at the 903 Pad (approximately 6,858 cy) and additional soil as necessary to removal all soil with contaminant concentrations greater than RFCA Tier I ALs and as indicated by ALARA and stewardship evaluations and dispose as appropriate, pending waste characterization;

- Evaluate remaining soil for additional removal through the consultative process using stewardship and ALARA considerations (Sections 5.4 and 5.5 of the ER RSOP); and

- Backfill with clean soil, regrade, and revegetate.

2.7 Treatment

Not applicable.

2.8 Confirmation Sampling

Confirmation samples will be collected to determine if accelerated action goals have been achieved. A 90-foot x 110-foot weather tent will be used to protect the excavation from weather-related delays. An estimated twenty areas (80 feet x 90 feet each) will be excavated within the tent. Subareas, either nine or sixteen to a tent, will be excavated and confirmation samples will be collected from the approximate middle of each subarea. This will result in at least 180 confirmation samples over the 903 Pad area. Because there may be some variation in the reach of the construction equipment and because of the tent structure, the exact size of the excavation subsections will be determined in the field.

2.9 Project-Specific Monitoring

Project-specific surface water and groundwater monitoring during remediation was planned through the yearly IMP process where additional monitoring is considered for

Decontamination & Decommissioning (D&D) and remediation projects. Air monitoring will be conducted in accordance with the Performance Monitoring for Radionuclides: 903 Pad Remediation Project (IHSS 112 & 155) (K-H 2002).

2.10 Resource Conservation and Recovery Act Units and Intended Waste Disposition

Not applicable.

2.11 Administrative Record Documents

DOE, 1992-2001, Historical Release Reports for the Rocky Flats Plant, Golden, Colorado.

DOE, 1995, Final Phase II RFI/RI Report for Operable Unit 2, 903 Pad, Mound and East Trenches Area, Rocky Flats Plant, Golden, Colorado, December.

DOE, 1999, Rocky Flats Environmental Technology Site, Quarterly Environmental Monitoring Report, April - June 1999, Golden, Colorado, August.

DOE, 1999, Rocky Flats Environmental Technology Site, Quarterly Environmental Monitoring Report, July - September 1999, Golden, Colorado, November.

DOE, 2000, Characterization Report for the 903 Drum Storage Area, 903 Lip Area, and Americium Zone, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2000, Rocky Flats Environmental Technology Site, Quarterly Environmental Monitoring Report, October - December 1999, Golden, Colorado, November.

DOE, 2000, Rocky Flats Environmental Technology Site, Quarterly Environmental Monitoring Report, January - March 2000, Golden, Colorado, May.

DOE, 2000, Rocky Flats Environmental Technology Site, Quarterly Environmental Monitoring Report, April - June 2000, Golden, Colorado, August.

DOE, 2000, Rocky Flats Environmental Technology Site, Quarterly Environmental Monitoring Report, July - September 2000, Golden, Colorado, November.

DOE, 2000, Report on Soil Erosion and Surface Water Sediment Transport Modeling for the Actinide Migration Evaluations at the Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, 2001, Draft Buffer Zone Data Summary Report, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2001, Rocky Flats Environmental Technology Site, Quarterly Environmental Monitoring Report, October - December 2000, Golden, Colorado, February.

DOE, 2001, Rocky Flats Environmental Technology Site, Quarterly Environmental Monitoring Report, January - March 2001, Golden, Colorado, May.

DOE, 2001, Rocky Flats Environmental Technology Site, Quarterly Environmental Monitoring Report, April - June 2001, Golden, Colorado, August.

DOE, 2001, Rocky Flats Environmental Technology Site, Quarterly Environmental Monitoring Report, July - September 2001, Golden, Colorado, November.

DOE, 2002, Rocky Flats Environmental Technology Site, Quarterly Environmental Monitoring Report, October - December 2001, Golden, Colorado, February.

DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2002, Buffer Zone Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

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

DOE, CDPHE, EPA, Kaiser-Hill, and RMRS, Rocky Flats Cleanup Agreement, Appendix 3 RFCA Implementation Guidance Document, July.

Kaiser-Hill Company, L.L.C, 2001, Project Plan for Surface Water Performance Monitoring of the 903 Drum Storage Area (IHSS 112) and Lip Area (IHSS 155) to Establish Baseline Surface Water Quality, July.

Kaiser-Hill Company, L.L.C., 2002, Performance Monitoring for Radionuclides: 903 Pad Remediation Project (IHSSs 112 & 155), May.

2.12 Projected Schedule

Remediation of IHSS 112 – 903 Pad is scheduled to begin in October 2002. It is anticipated that this project will take 6 months to complete.

3.0 PUBLIC PARTICIPATION

ER RSOP Notification #02-09 activities were discussed at several ER/D&D Status meetings. Additionally, ER RSOP Notification was subject to a 30-day public review process. This Notification is available at the Rocky Flats Reading Rooms.

4.0 REFERENCES

DOE, 1992-2001, Historical Release Reports for the Rocky Flats Plant, Golden, Colorado.

DOE, 1995 Final Phase II RFI/RI Report for Operable Unit 2, 903 Pad, Mound and East Trenches Area, Rocky flats Plant, Golden Colorado, December.

DOE, 1999a, Rocky Flats Environmental Technology Site, Quarterly Environmental Monitoring Report, April - June 1999, Golden, Colorado, August.

DOE, 1999b, Rocky Flats Environmental Technology Site, Quarterly Environmental Monitoring Report, July - September 1999, Golden, Colorado, November.

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

DOE, CDPHE, EPA, Kaiser-Hill, and RMRS, 1999, Rocky Flats Cleanup Agreement, Appendix 3 RFCA Implementation Guidance Document, July.

DOE, 2000a, Characterization Report for the 903 Drum Storage Area, 903 Lip Area, and Americium Zone, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2000b, Rocky Flats Environmental Technology Site, Quarterly Environmental Monitoring Report, October - December 1999, Golden, Colorado, November.

DOE, 2000c, Rocky Flats Environmental Technology Site, Quarterly Environmental Monitoring Report, January - March 2000, Golden, Colorado, May.

DOE, 2000d, Rocky Flats Environmental Technology Site, Quarterly Environmental Monitoring Report, April - June 2000, Golden, Colorado, August.

DOE, 2000e, Rocky Flats Environmental Technology Site, Quarterly Environmental Monitoring Report, July - September 2000, Golden, Colorado, November.

DOE, 2000f, Report on Soil Erosion and Surface Water Sediment Transport Modeling for the Actinide Migration Evaluations at the Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, 2001a, Draft Buffer Zone Data Summary Report, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, 2001b, Rocky Flats Environmental Technology Site, Quarterly Environmental Monitoring Report, October - December 2000, Golden, Colorado, February.

DOE, 2001c, Rocky Flats Environmental Technology Site, Quarterly Environmental Monitoring Report, January - March 2001, Golden, Colorado, May.

DOE, 2001d, Rocky Flats Environmental Technology Site, Quarterly Environmental Monitoring Report, April - June 2001, Golden, Colorado, August.

DOE, 2001e, Rocky Flats Environmental Technology Site, Quarterly Environmental Monitoring Report, July - September 2001, Golden, Colorado, November.

DOE, 2002a, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2002b, Buffer Zone Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2002c, Rocky Flats Environmental Technology Site, Quarterly Environmental Monitoring Report, October - December 2001, Golden, Colorado, February.

Kaiser-Hill Company, L.L.C, 200,1 Project Plan for Surface Water Performance Monitoring of the 903 Drum Storage Are (IHSS 112) and Lip Area (IHSS 155) to Establish Baseline Surface Water Quality, July

Kaiser-Hill Company, L.L.C., 2002, Performance Monitoring for Radionuclides: 903 Pad Remediation Project (IHSS 112 & 155), May.