

Synopsis of Kaiser-Hill's 2006

Section 3.0 Nature and Extent of Soil Contamination

RCRA Facility Investigation –

Remedial Investigation/ Corrective Measures Study –

Feasibility Study Report for the Rocky Flats Environmental Technology Site

Prepared for the

Rocky Flats Nuclear Guardianship

by

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The Rocky Flats National Wildlife Refuge Act of 2001 defined the future land use for RFETS as a wildlife refuge. Therefore Kaiser-Hill, primarily related contaminants present in soils to concentrations that pose an excess cancer risk equal to or less than 1×10^{-6} and/or a Hazard Quotient (HQ) of less than 0.1 to a Wildlife Refuge Worker. Contaminants that were historically used at RFETS and found at concentrations greater than the WRW PRGs in soil, are referred to as an Analyte of Interest (AOI). However, as Kaiser-Hill states, AOIs do not necessarily prompt a remedial response or indicate unacceptable levels of contamination, rather these elevated concentrations suggest a possible need for remedy evaluation. Remedial action was not discussed in section 3.0 of Kaiser-Hill's RCRA Facility Investigation and therefore is not a component of this synopsis. The intent of this synopsis is to present the extent of soil contamination determined by Kaiser-Hill from data that was collected from 1991 through 2005.

A Rocky Flats Historical Release Report (HRR) was published in 1992 based on 20 years of DOE documentation, information gathered from Rocky Flats operating records, and interviews of persons with knowledge of Rocky Flats operations and events of released or suspected released of hazardous substances. In the HRR, known and suspected sources of contamination are organized into Individual Hazardous Substance Sites (IHSSs), Potential Areas of Concern (PACs), and Under Building Contamination Sites (UBCs). Figures 1.2 and 1.3, depict the identified IHSSs, PACs, and UBCs in the buffer and industrial areas of RFETS. As declared necessary by the Interagency Agreement and the 1996 Rocky Flats Cleanup Agreement, the DOE investigated and characterized the soil contamination at IHSSs to determine if hazardous substances were present at levels that required disposition or if no remedial action was required pursuant to IAG and/or RFCA requirements. The RFCA Parties, which consists of the DOE, EPA, and CDPHE, agreed that no other areas than the ones identified had activities that may have affected subsurface soil or other environmental media. In order to prove this, additional soil sampling was conducted in the buffer zone and if radionuclides and metals were not detected then those areas were deemed to have no indication of subsurface contamination.

In 2006 Kaiser-Hill Company, L.L.C. declared that two sources of subsurface contamination remained after the accelerated actions clean-up: the Present Landfill and the Original Landfill. Kaiser-Hill's remedial investigation aimed at identifying and evaluating other potential sources that could pose a threat to human health and the environment. The evaluation of soil by Kaiser-Hill included data collected from 1991 through 2005. Data used were from previous investigations conducted prior to the Rocky Flats Compliance Agreement, samples collected to determine whether RCFA accelerated actions were required, and samples to confirm that RFCA accelerated actions were completed. If you are interested in the methods utilized to collect soil data locate the *Industrial Area and Buffer Zone Sampling and Analysis Plan (IABZSAP)*. Regulatory permitted sampling and analysis protocols changed over time and to account for various sampling methods, Kaiser-Hill ran data from the Soil Water Database through an algorithm to ensure usability. From the 1.3 million records for soil, Kaiser-Hill found 542,000 records to be unusable in their investigation. Some examples of records filtered out through this data processing include samples that were analyzed by gamma spectroscopy, x-ray fluorescence, samples that were no longer representative, and rejected during data validation.

Table 3.1 shows how Kaiser-Hill distinguished soil horizon layers for assessment. Kaiser-Hill emphasizes that the data they reported is representative of conditions immediately following the completion of accelerated actions. In other words, the data summarized in this report from the RI/FS Report does not account for any addition of clean soil that may have occurred. Since no surface and subsurface soil

depth profiles were adjusted to account for soil backfilling and recontouring, Kaiser-Hill views their assessment as a conservative representation of contamination.

Table 3.1 Soil Profiles and Considerations

Soil Profile	Depth Intervals	General Considerations by Kaiser-Hill
Surface Soil	L0 ≤ 6 in	Contamination is accessible to surface users by direct contact or suspension from WRW surface use activities or wind and/or water erosion
Subsurface Soil	6 in < L1 ≤ 3 ft	Contamination may be accessible by localized disturbances of small areas related to WRW surface uses, such as post-hole digging or vegetation management, and by burrowing receptors (prairie dogs)
	3 ft < L2 ≤ 8 ft	Contamination may be accessible by deeper disturbances related to WRW surface uses, such as disturbances of small areas by burrowing receptors by burrowing receptors
	8 ft < L3 ≤ 12 ft	This is below the average depth of excavation by burrowing receptors
	L4 > 12 ft	Contaminations measurements at depth intervals below 12 ft are presented to further show the vertical gradation of soil contamination levels

Various groups of analytes were assessed including radionuclides, metals, inorganics, VOCs, SVOCs, PCBs, pesticides, herbicides, and dioxins. Kaiser-Hill was tasked with defining the lateral and vertical extent of site-related soil contamination after completion of accelerated actions.

Two different programs for surface and subsurface soil collected background concentration data for the RFETS. To understand how background concentrations were determined access the *Geochemical Characterization of Background Surface Soils: Background Soils Characterization Program* (DOE 1995) and the corresponding subsurface soil report (DOE 1993). Summaries of background data statistics are available in Table 3.9 and 3.10. In accordance with CERCLA requirements the background mean plus two standard deviations (M2SD) were used for comparison. Not all analytes have background levels, for example any detection of organic compounds is indicative of contamination. Also, not all analytes have WRW PRGs due to the lack of toxicity information available for those contaminants. Kaiser-Hill did not assess analytes without WRW PRGs but a list of these analytes and discussion of the uncertainty are attached to Kaiser-Hill’s RCRA Facility Investigation and may be found on the DOE Legacy Management Website.

**Table 3.9
Sitewide Surface Soil Background Data Summary**

Analyte	Unit	Number of Samples	Number of Detects	Percent Detected	Maximum Concentration Detected	Minimum Concentration Detected	Mean Concentration ^a	Standard Deviation ^a	Mean +2StDev
Aluminum	mg/kg	20	20	100%	17,100	4,050	10,203	3,256	16,715
Americium-241	pCi/g	50	50	100%	0.025	1.00E-03	0.010	0.006	0.022
Ammonia (as N)	mg/kg	20	13	65%	7.00	1.00	2.03	1.90	5.83
Antimony	mg/kg	20	0	0	N/A	N/A	0.279	0.078	0.436
Arsenic	mg/kg	20	20	100%	9.60	2.30	6.09	2.00	10.1
Barium	mg/kg	20	20	100%	134	45.7	102	19.4	141
Beryllium	mg/kg	20	20	100%	0.900	0.240	0.660	0.152	0.964
Cadmium	mg/kg	20	13	65%	2.30	0.670	0.708	0.455	1.62
Calcium	mg/kg	20	20	100%	4,550	1,450	2,965	750	4,464
Cesium	mg/kg	20	0	0	N/A	N/A	6.54	0.224	6.99
Cesium-134	pCi/g	70	70	100%	0.300	0.050	0.148	0.059	0.266
Cesium-137	pCi/g	70	70	100%	1.80	0.070	0.911	0.391	1.69
Chromium (total)	mg/kg	20	20	100%	16.9	5.50	11.2	2.78	16.8
Cobalt	mg/kg	20	20	100%	11.2	3.40	7.27	1.79	10.9
Copper	mg/kg	20	20	100%	16.0	5.20	13.0	2.58	18.1
Iron	mg/kg	20	20	100%	16,100	7,390	12,409	2,596	17,601
Lead	mg/kg	20	20	100%	53.3	8.60	33.5	10.5	54.6
Lithium	mg/kg	20	20	100%	11.6	4.80	7.66	1.89	11.4
Magnesium	mg/kg	20	20	100%	2,800	1,310	1,909	463	2,834
Manganese	mg/kg	20	20	100%	357	129	237	63.9	365
Mercury	mg/kg	20	8	40%	0.120	0.090	0.072	0.031	0.133
Molybdenum	mg/kg	20	0	0	N/A	N/A	0.573	0.184	0.941
Nickel	mg/kg	20	20	100%	14.0	3.80	9.60	2.59	14.8
Nitrate (as N)	mg/kg	20	20	100%	7.00	2.00	4.00	1.69	7.37
Plutonium-239/240	pCi/g	50	50	100%	0.350	0.017	0.045	0.047	0.066/0.138 ^b
Potassium	mg/kg	20	20	100%	2,830	1,110	2,055	449	2,952
Radium-226	pCi/g	20	20	100%	0.870	0.100	0.620	0.156	0.932
Radium-228	pCi/g	20	20	100%	2.30	0.200	1.35	0.480	2.31
Selenium	mg/kg	20	12	60%	1.40	0.680	0.628	0.305	1.24
Silica	mg/kg	20	20	100%	1,650	934	1,385	178	1,741
Silver	mg/kg	20	0	0	N/A	N/A	0.207	0.007	0.221
Sodium	mg/kg	20	20	100%	105	43.8	63.6	15.7	95.0
Strontium	mg/kg	20	20	100%	45.2	9.60	28.4	10.2	48.8
Strontium-89/90	pCi/g	50	50	100%	0.610	0.063	0.251	0.128	0.508
Thallium	mg/kg	14	0	0	N/A	N/A	0.414	0.015	0.443
Tin	mg/kg	20	0	0	N/A	N/A	2.06	0.410	2.88
Uranium-233/234	pCi/g	20	20	100%	3.10	0.660	1.10	0.578	2.25
Uranium-235	pCi/g	20	20	100%	0.110	0.033	0.054	0.020	0.095
Uranium-238	pCi/g	20	20	100%	2.60	0.740	1.09	0.456	2.00
Vanadium	mg/kg	20	20	100%	45.8	10.8	27.7	7.68	43.1
Zinc	mg/kg	20	20	100%	75.9	21.1	49.8	12.2	74.2

^a The mean concentration of the standard deviation is compiled using one-half the reported value for nondetects.

^b The plutonium-239/240-calculated background M2SD is 0.138 pCi/g. However, for the purpose of the nature and extent of soil contamination, it is agreed to continue using the approved DOE Geochemical Characterization Report (DOE 1995) plutonium-239/240 background M2SD of 0.066 pCi/g.

N/A = not applicable

**Table 3.10
Sitewide Subsurface Soil Background Data Summary**

Analyte	Unit	Number of Samples	Number of Detects	Percent Detected	Maximum Concentration Detected	Minimum Concentration Detected	Mean Concentration ^a	Standard Deviation ^a	Mean +2StDev
Aluminum	mg/kg	44	44	100%	40,700	4,300	14,160	8,116	30,392
Americium-241	pCi/g	13	13	100%	0.010	-0.010	-0.002	0.006	0.010
Antimony	mg/kg	28	2	7%	8.20	2.90	4.21	2.78	9.78
Arsenic	mg/kg	45	42	93%	41.8	1.70	5.48	6.02	17.5
Barium	mg/kg	45	40	89%	491	36.8	114	88.6	291
Beryllium	mg/kg	45	43	96%	22.4	1.00	5.76	5.01	15.8
Cadmium	mg/kg	37	2	5%	1.50	1.40	0.569	0.254	1.08
Calcium	mg/kg	45	45	100%	157,000	1,130	10,426	23,141	56,708
Cesium	mg/kg	43	1	2%	274	274	118	27.2	172
Cesium-137	pCi/g	45	45	100%	0.200	0.00E+00	0.027	0.058	0.143
Chromium (total)	mg/kg	45	45	100%	69.6	5.80	18.4	11.9	42.2
Cobalt	mg/kg	45	12	27%	20.5	4.50	5.99	4.71	15.4
Copper	mg/kg	45	43	96%	31.6	2.20	11.6	6.09	23.8
Gross Alpha	pCi/g	45	45	100%	46.0	3.00	26.2	8.95	44.1
Gross Beta	pCi/g	45	45	100%	41.0	6.00	24.0	7.00	38.0
Iron	mg/kg	45	45	100%	35,900	5,750	15,046	6,707	28,459
Lead	mg/kg	45	45	100%	25.8	4.20	13.9	6.31	26.5
Lithium	mg/kg	45	25	56%	31.3	3.30	9.83	5.32	20.5
Magnesium	mg/kg	45	42	93%	5,580	1,290	2,803	1,362	5,526
Manganese	mg/kg	45	45	100%	747	16.0	171	158	487
Mercury	mg/kg	41	12	29%	0.640	0.190	0.155	0.166	0.488
Molybdenum	mg/kg	45	30	67%	41.0	3.50	13.5	7.80	29.1
Nickel	mg/kg	44	44	100%	54.2	4.30	20.9	11.1	43.0
Nitrate (as N)	mg/kg	44	27	61%	7.08	1.10	1.57	1.38	4.33
Plutonium-239/240	pCi/g	45	45	100%	0.030	-0.002	0.006	0.008	0.022
Potassium	mg/kg	44	29	66%	3,830	698	1,351	938	3,227
Radium-226	pCi/g	31	31	100%	1.30	0.400	0.784	0.279	1.34
Radium-228	pCi/g	31	31	100%	2.10	1.00	1.45	0.320	2.09
Selenium	mg/kg	38	0	0	N/A	N/A	0.592	0.543	1.68
Silver	mg/kg	37	18	49%	40.9	1.50	6.39	10.1	26.6
Sodium	mg/kg	45	10	22%	3,680	194	349	551	1,450
Strontium	mg/kg	45	27	60%	226	25.1	50.3	42.6	136
Strontium-89/90	pCi/g	45	45	100%	0.800	-0.600	-0.038	0.304	0.570
Sulfide	mg/kg	41	16	39%	7.20	2.00	2.20	1.48	5.16
Thallium	mg/kg	35	2	6%	0.400	0.220	0.476	0.472	1.42
Tin	mg/kg	41	15	37%	441	25.7	86.0	134	354
Uranium-233/234	pCi/g	45	45	100%	3.40	0.200	0.829	0.625	2.08
Uranium-235	pCi/g	45	45	100%	0.300	0.00E+00	0.036	0.063	0.162
Uranium-238	pCi/g	45	45	100%	3.20	0.200	0.792	0.491	1.77
Vanadium	mg/kg	45	44	98%	70.0	11.4	33.8	14.8	63.3
Zinc	mg/kg	44	44	100%	79.8	0.520	36.2	21.0	78.3

^aThe mean concentration of the standard deviation is compiled using one-half the reported value for nondetects.
N/A = not applicable

In regards to the buffer zone, Kaiser Hill declared that surface soil grid sampling provided data that supported the conclusions that releases to the environment did not occur outside of the known or suspected historical source areas. In other words Kaiser-Hill concluded that no additional sources of contamination existed in the buffer zone. This does not mean that contaminants were not present at concentrations or activities greater than WRW PRG in the buffer zone during the time period of this characterization. Plutonium 239/240 is an example of an AOI with activities greater than the WRW PRG located primarily within the BZ OU east of the historical 903 pad.

The determination of an Analyte of Interest (AOI) occurred in a series of steps. Initially analytes were eliminated as an Analyte of Interest (AOI) if sampling results within a certain depth interval were found to be less than the background (M2SD). AOIs established from initial screening are then compared to the WRW PRGs and if one or more samples were found to exceed WRW PRGs then the AOI was further examined. Lastly, AOIs with a frequency of detection greater than the WRW PRGs of less than 1% were eliminated as AOIs because the infrequency was viewed as indication of an isolated area of contamination rather than a widespread area of contamination. However, if process knowledge proved that the analyte (for example, uranium) was associated with RFETS then the AOI was not eliminated

even if the frequency detection was less than 1%. This synopsis does not include a list of the contaminants that were screened out, to see the contaminants that were screened out and at what steps they failed to qualify as AOIs see table 3.12 of *RCRA Facility Investigation-Remedial Investigation/Corrective Measures Study-Feasibility Study Report* (Kaiser-Hill 2006). From this AOI determination process Kaiser-Hill identified 14 surface soil AOIs as shown in the table below.

Surface Soil AOIs

Analyte Group	Analyte	Derived CAS No.	Unit	Number of Samples	Number of Detections	Frequency of Detection (%)	AOI Screen 1				AOI Screen 2		AOI Screen 3	
							Maximum Concentration	Data Qualifier ^a	Background Mean + 2SD	Number Detections > Background Mean + 2SD	Percent Detections > Background Mean + 2SD	WRW PRG	Number Detections > WRW PRG	Percent Detections > WRW PRG
Radionuclide	Uranium-233/234		pCi/g	1901	1887	99.26	47.4833		2.25	100	5.26	25.3	2	0.11
Radionuclide	Uranium-235	15117-96-1	pCi/g	1900	1129	59.42	2.2385		0.095	231	12.16	1.05	3	0.16
Radionuclide	Uranium-238	7440-61-1	pCi/g	1901	1894	99.63	209.2773		2.00	152	8.00	29.3	5	0.26
Metal	Vanadium	7440-62-2	mg/kg	2622	2621	99.96	5300		43.1	304	11.59	111	16	0.61
Radionuclide	Americium-241	86954-36-1	pCi/g	2024	1551	76.63	51.2	B	0.022	1097	54.20	7.69	22	1.09
SVOC	Dibenz(a,h)anthracene	53-70-3	µg/kg	1217	164	13.48	9200	DJ			N/A	379	19	1.56
PCB	PCB-1260 ^b	11096-82-5	µg/kg	838	144	17.18	7800				N/A	1,349	17	2.03
PCB	PCB-1254 ^b	11097-69-1	µg/kg	842	151	17.93	8900	C			N/A	1,349	20	2.38
Metal	Arsenic ^c	7440-38-2	µg/kg	2613	2586	98.97	56.2		10.1	70	2.68	2.41	70	2.68
Metal	Aluminum	7429-90-5	mg/kg	2622	2620	99.92	61000		16,715	450	17.16	24,774	105	4.00
Dioxins and Furans	2378-TCDD TEQ ^d		µg/kg	22	22	100.00	0.073883				N/A	0.025	1	4.55
Radionuclide	Plutonium-239/240		pCi/g	2336	1987	85.06	183	B	0.066	1289	55.18	9.80	128	5.48
Metal	Chromium (total) ^e	7440-47-3	mg/kg	2624	2604	99.24	210		16.8	675	25.72	28.4	147	5.60
SVOC	Benzo(a)pyrene	50-32-8	µg/kg	1235	509	41.21	43000	E			N/A	379	188	15.22

Note: The information presented in this table is listed in order of increasing frequency of detection greater than the WRW PRG.
 The frequency of detection of the analyte concentration above the WRW PRG is greater than (>) 0% and less than (<) 1%
 The frequency of detection of the analyte concentration above the WRW PRG is greater than or equal to (≥) 1% and less than (<) 5%
 The frequency of detection of the analyte concentration above the WRW PRG is greater than or equal to (≥) 5%

Two AOIs were identified in subsurface soil at a depth of 0.5 ≤ 3.0 ft

Table 3.15
Subsurface Soil (> 0.5 and ≤ 3.0 ft) AOIs

Analyte Group	Analyte	Derived CAS No.	Unit	Number of Samples	Number of Detections	Frequency of Detection (%)	AOI Screen 1				AOI Screen 2		AOI Screen 3	
							Maximum Concentration	Data Qualifier ^a	Background Mean + 2SD	Number Detections > Background Mean + 2SD	Percent Detections > Background Mean + 2SD	WRW PRG	Number Detections > WRW PRG	Percent Detections > WRW PRG
Metal	Lead ^b	7439-92-1	mg/kg	1686	1685	99.94	8500		26.471	143	8.48	1,000	3	0.18
SVOC	Benzo(a)pyrene	50-32-8	µg/kg	584	143	24.49	35000				N/A	4,357	6	1.03

Eight AOIs were identified in subsurface soil at a depth of > 3.0 ≤ 8.0 ft

Table 3.17
Subsurface Soil (> 3 and ≤ 8 ft) AOIs

Analyte Group	Analyte	Analyte ID	Derived CAS No.	Unit	Number of Samples	Number of Detections	Frequency of Detection (%)	AOI Screen 1				AOI Screen 2	AOI Screen 3		
								Maximum Concentration	Data Qualifier ^a	BackGround Mean + 2SD	Number of Detections > Background Mean + 2SD	Percent Detections > Background Mean + 2SD	WRW PRG	Number Detections > WRW PRG	Percent Detections > WRW PRG
Metal	Lead ^b	74	7439-92-1	mg/kg	1402	1399	99.79	5200		26.5	58	4.14	1,000	1	0.07
VOC	Tetrachloroethene	23	127-18-4	µg/kg	1793	195	10.88	197000	E			N/A	77,111	4	0.22
Metal	Chromium (total) ^c	92	7440-47-3	mg/kg	1397	1387	99.28	11000		42.2	43	3.08	327	4	0.29
Radionuclide	Uranium-235	4	15117-96-1	pCi/g	900	546	60.67	36.1168604		0.162	59	6.56	12.1	3	0.33
Radionuclide	Uranium-238	5	7440-61-1	pCi/g	900	890	98.89	1130		1.77	79	8.78	337	3	0.33
Radionuclide	Americium-241	3	86954-36-1	pCi/g	872	521	59.75	410		0.010	337	38.65	88.4	3	0.34
SVOC	Benzo(a)pyrene	131	50-32-8	µg/kg	543	75	13.81	11000				N/A	4,357	5	0.92
Radionuclide	Plutonium-239/240	1		pCi/g	885	594	67.12	2450		0.022	372	42.03	112	9	1.02

Six AOIs were identified in subsurface soil at a depth of > 8.0 ≤ 12.0 ft

Table 3.19
Subsurface Soil (> 8 and ≤ 12 ft) AOIs

Analyte Group	Analyte	Derived CAS No.	Unit	Number of Samples	Number of Detections	Frequency of Detection (%)	AOI Screen 1				AOI Screen 2	AOI Screen 3		
							Maximum Concentration	Data Qualifier ^a	BackGround Mean + 2SD	Number of Detections > Background Mean + 2SD	Percent Detections > Background Mean + 2SD	WRW PRG	Number Detections > WRW PRG	Percent Detections > WRW PRG
VOC	Tetrachloroethene	127-18-4	µg/kg	770	96	12.47	91000	E			N/A	77,111	1	0.13
Metal	Chromium (total) ^b	7440-47-3	mg/kg	568	560	98.59	8310		42.2	19	3.35	327	1	0.18
Radionuclide	Uranium-235	15117-96-1	pCi/g	394	288	73.10	37.68		0.162	24	6.09	12.1	2	0.51
Radionuclide	Uranium-238	7440-61-1	pCi/g	394	393	99.75	1160		1.77	49	12.44	337	2	0.51
Radionuclide	Plutonium-239/240		pCi/g	389	272	69.92	223		0.022	81	20.82	112	2	0.51
SVOC	Benzo(a)pyrene	50-32-8	µg/kg	259	15	5.79	43000				N/A	4,357	3	1.16

Seven AOIs were identified in subsurface soil at a depth of > 12.0 ≤ 30.0 ft

Table 3.21
Subsurface Soil (> 12.0 and ≤ 30.0 ft) AOIs

Analyte Group	Analyte	Derived CAS No.	Unit	Number of Samples	Number of Detections	Frequency of Detection (%)	AOI Screen 1				AOI Screen 2	AOI Screen 3		
							Maximum Concentration	Data Qualifier ^a	BackGround Mean + 2SD	Number of Detections > Background Mean + 2SD	Percent Detections > Background Mean + 2SD	WRW PRG	Number Detections > WRW PRG	Percent Detections > WRW PRG
VOC	Chloroform	67-66-3	µg/kg	1071	100	9.34	3800000				N/A	90,270	1	0.09
VOC	Methylene Chloride	75-09-2	µg/kg	1071	281	26.24	5500000	JB			N/A	3.13E+06	1	0.09
VOC	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	1055	4	0.38	6100000	J			N/A	120,551	1	0.09
VOC	Trichloroethene	79-01-6	µg/kg	1070	148	13.83	309000	JE			N/A	20,354	2	0.19
VOC	Tetrachloroethene	127-18-4	µg/kg	1071	192	17.93	2800000	E			N/A	77,111	5	0.47
VOC	Carbon Tetrachloride	56-23-5	µg/kg	1070	115	10.75	160000000	E			N/A	97,124	7	0.65
PCB	PCB-1260 ^b	11096-82-5	µg/kg	271	12	4.43	70000				N/A	15,514	5	1.85

Below is a comprehensive table showing the number of detects for each contaminant greater than WLW PRG and the frequency of detection indicated by the color of highlighting for each depth interval.

Table 3.24
AOIs by Depth Interval

Type	Group	Standard Name	Derived CAS	Derived Unit	Table 3.13	Table 3.15	Table 3.17	Table 3.19	Table 3.21	Table 3.22	Table 3.23
					Surface (≤ 0.5 ft) *End Depth	Subsurface (> 0.5 & ≤ 3 ft)	Subsurface (> 3 & ≤ 8 ft)	Subsurface (> 8 & ≤ 12 ft)	Subsurface (> 12 & ≤ 30 ft)	Subsurface (> 30 & ≤ 50 ft)	Subsurface (> 50 ft)
Inorganic	Metal	Aluminum	7429-90-5	mg/kg	105						
Inorganic	Metal	Arsenic	7440-38-2	mg/kg	70						
Inorganic	Metal	Lead	7439-92-1	mg/kg		3	1				
Inorganic	Metal	Chromium (total)a	7440-47-3	mg/kg	147		4	1			
Inorganic	Metal	Vanadium	7440-62-2	mg/kg	16						
Organic	Dioxins/Furans	2,3,7,8-TCDD TEQb	1746-01-6	mg/kg	1						
Organic	PCB	PCB-1254c	11097-69-1	mg/kg	20						
Organic	PCB	PCB-1260c	11096-82-5	mg/kg	17				5		
Organic	SVOC	Benzo(a)pyrene	50-32-8	mg/kg	188	6	5	3			
Organic	SVOC	Dibenz(a,h)anthracene	53-70-3	mg/kg	19						
Organic	VOC	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg					1		
Organic	VOC	Carbon Tetrachloride	56-23-5	mg/kg					7		
Organic	VOC	Chloroform	67-66-3	mg/kg					1		
Organic	VOC	Methylene Chloride	75-09-2	mg/kg					1		
Organic	VOC	Tetrachloroethene	127-18-4	mg/kg			4	1	5		
Organic	VOC	Trichloroethene	79-01-6	mg/kg					2		
Radiomclide	Radiomclide	Americium-241	86954-36-1	pCi/g	22		3				
Radiomclide	Radiomclide	Plutonium-239/240		pCi/g	128		9	2			
Radiomclide	Radiomclide	Uranium-233/234		pCi/g	2						
Radiomclide	Radiomclide	Uranium-235	15117-96-1	pCi/g	3		3	2			
Radiomclide	Radiomclide	Uranium-238	7440-61-1	pCi/g	5		3	2			

To illustrate the areal and vertical extent of contamination maps were created. Dark gray dots indicate locations where the analyte was not detected. Blue dots indicate locations where the analyte concentration was greater than the detection limit but less than or equal to background levels. Green dots indicate locations where the analyte concentration was greater than the detection limit but less than the WRW PRG. Yellow dots indicate locations where the analyte concentration was greater than or equal to WRW PRG. Figures 3.6 - 3.19 depict surface soil AOIs, figures 3.20 – 3.27 depict AOIs in the 0.5 to 12 foot subsurface soil range, and figures 3.28 – 3.34 depict AOIs in the 12 to 50 foot subsurface soil range.