SWMU 9 - Coke Fines Area

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5.5.9 SWMU 9 - Coke Fines Area

The Coke Fines Area, Solid Waste Management Unit (SWMU) 9, is located south of the Coarse and Granulated Slag Piles. The location of SWMU 9 is shown on Figure 5.5.9-1a and SWMU 9 monitoring stations and sample locations are provided on Figure 5.5.9-1b. Coke was used as a feedstock to scavenge oxygen in the electric arc furnace. Coke fines were generated from screening coke and were not suitable for elemental phosphorus production. Coke fines were stockpiled in SWMU 9 and were sold to other industries. The material stockpile is no longer present, but coke fines remain at the surface or are mixed with the surface soil. The horizontal extent of the Coke Fines Area is shown on Figure 5.5.9-1b; it was identified by the black color of the surface soil and covers approximately 8 acres. Coke is a relatively homogeneous carbon material that is processed from coal and contains concentrations of metals and polycyclic aromatic hydrocarbon (PAH) compounds.

The objectives of the RFI work plan for SWMU 9 were to evaluate the lateral and vertical extent of hazardous constituents within the Coke Fines Area. Specifically, this was accomplished by characterizing the hazardous constituent concentrations in the discolored soils and evaluating the vertical and horizontal extent by sampling non-discolored soils to confirm the visually defined limits.

5.5.9.1 RFI Activities

Two rounds of investigation activities were conducted at the Coke Fines Area. The first round, in 2006, involved random sampling at two pre-determined depth intervals at locations randomly selected within the SWMU. The second round, in 2009, was designed to fill data gaps identified based on the 2006 investigation data and to confirm the visual perimeter delineation by chemical signature.

5.5.9.1.1 2006 Investigation Activities

SWMU 9 was included in the X-ray fluorescence (XRF) Pilot Test Program implemented in 2006. Section 5.4.2 provides a detailed evaluation of the XRF Pilot Test Program. Soil samples were collected from 17 locations (*see* Figure 5.5.9-1b) from the 0- to 2-inch and 2- to 12-inch depth interval (total of 34 samples). The discrete soil samples were analyzed for metals using U.S. EPA Method 6200 Field Portable X-Ray Fluorescence Spectrometry for the Determination of Elemental Concentrations in Soil and Sediment. At three locations, confirmatory (i.e., split) samples were analyzed at a commercial analytical laboratory for comparison to the XRF data. The confirmatory samples from SWMU 9 were also analyzed for semivolatile organic compounds (SVOCs).

5.5.9.1.2 2009 Investigation Activities

The 2009 XRF screening and confirmatory program consisted of XRF analysis of soil samples, laboratory analysis of confirmatory (i.e., split) samples at a rate of one per twenty samples analyzed by XRF, and laboratory analysis of spilt samples, if the XRF reported a metals concentration greater than the respective threshold concentration defined in Section 5.4.2. The 2009 program had 3 components: (1) vertical extent delineation and confirmation, (2) horizontal extent delineation and confirmation, and (3) specific sample confirmation.

The first component of the 2009 program was a subsurface investigation conducted to evaluate the vertical extent of coke fines containing hazardous constituents at the Coke Fines Area. Test pits were excavated to a depth where the soils were no longer discolored by coke fines. Test pits were advanced using a rubber tire backhoe at locations CF-14, CF-16 and CF-20 to evaluate the vertical extent of coke fines. Soil samples were collected from the interval below the discoloration (approximately 0.3 to 1.3 feet bgs). The test pit logs are provided in Appendix 5.5.9-A. These samples were analyzed according to the XRF screening and confirmatory analytical protocols. These samples were also analyzed for SVOCs.

The second component used shallow pits excavated by hand to define the horizontal extent of coke fines. Upon establishing the horizontal extent of coke fines, surface soil samples (0-2 inch bgs) were collected at 4 locations around the perimeter of the Coke Fines Area (CF-30, CF-31, CF-32, CF-34) to characterize the visually-defined horizontal extent of the Coke Fines Area. An additional sample (CF-33) was collected from a nearby area that appeared to contain some windblown coke fines. These samples were analyzed according to the XRF screening and confirmatory analytical protocols, and were also analyzed for SVOCs and radionuclides.

The third component of the 2009 investigation was a follow-up to the 2006 XRF Pilot Test Program: a sample was collected from the 2-to 12-inch soil sample interval at CF-8 using a hand auger. The original sample exhibited XRF concentrations greater than the threshold limit for arsenic. The follow-up sample was analyzed for arsenic at the commercial analytical laboratory.

5.5.9.2 RFI Results

This section discusses the results of the investigation of the Coke Fines Area. The Coke Fines Area was delineated by visual characterization of the soils containing black coke fines. The SWMU 9 sample data and background values (i.e., mean, maximum and 95% upper confidence limit of the mean) are summarized in Tables 5.5.9-1 through 5.5.9-3. The locations of all the samples are shown on Figure 5.5.9-1b. The data presentation Figures 5.5.9-2 through 5.5.9-27, show the locations,

concentrations and depth intervals for the data reported on the figures. The location of a conceptual cross section through the Coke Fines Area is shown on Figure 5.5.9-28 and the cross section is depicted on Figure 5.5.9-29. The conceptual cross section is based on the test trenches installed in the SWMU. Cross sections 5.5.9-30 through 5.5.9-33 present the vertical and horizontal distribution of select parameters within the SWMU.

Soil data from SWMU 9 were compared to the background/reference area concentrations. Concentrations above the 95% upper confidence limit of the mean background/reference area concentrations are highlighted on the constituent delineation figures presented in this section. Where a 95% upper limit could not be calculated, the maximum detected concentration or the maximum detection limit was selected.

Constituent concentrations are described in this report as above background/reference area concentrations if the mean and maximum concentrations of the SWMU data exceed both of the mean and maximum background/reference area values. All data will be retained for evaluation in the human health and ecological risk assessments. The definitive background comparison will be conducted in the risk assessment using a statistical approach consistent with EPA guidance (U.S. EPA 2002).

5.5.9.2.1 Metals

The analytical laboratory and correlated XRF data were combined to assist the delineation of the hazardous constituents. Hazardous constituent concentrations based on the XRF data were estimated using the linear equations presented in Section 5.4.2 for the respective hazardous constituents. The correlation coefficient (R^2) is greater than 0.7 for these hazardous constituents. The metals data are presented in Table 5.5.9-1. The 2006 XRF evaluations provided correlated data for arsenic, cadmium, chromium, copper, iron, lead, nickel, and zinc. The 2009 XRF evaluation provided data for arsenic, cadmium, chromium, lead, manganese, selenium, silver, uranium, vanadium and zinc.

As detailed below, certain metals are present at concentrations above the background concentrations. A risk assessment will be necessary to evaluate which parameters, if any, are present at concentrations that warrant corrective measures. The dataset would be reviewed at that time and additional sampling may be necessary to inform the corrective measures study or later during the corrective measures design phase.

5.5.9.2.1.1 Group A

The metals included in Group A are arsenic, cadmium, chromium and copper. The distribution of these metal constituents in the 0 to 2-inch; the 2 to 12-inch; and below the visible coke fines intervals are shown on Figures 5.5.9-2 through 5.5.9-4, respectively.

Arsenic, cadmium, and copper concentrations are consistent with background concentrations since the maximum concentration does not exceed the maximum concentration in the background data set.

Chromium is naturally present in coke and the native soils across the United States. Chromium was detected in 11 of 48 soil samples at concentrations ranging from not detected at 2.0 mg/kg to 370 mg/kg. Chromium is present at concentrations above background in the soils that contain coke fines. Chromium was not detected at a detection limit of 2 mg/kg in samples collected below the coke fines. Chromium was not detected (detection limit of 2 mg/kg) in 3 of the 5 perimeter samples. Chromium was reported at 278 mg/kg in perimeter sample CF-34 but was not detected in the sample collected at CF-33.

5.5.9.2.1.2 Group B

The metals included in Group B are iron, lead, manganese and nickel. The distribution of these metal constituents in the 0 to 2-inch; the 2 to 12-inch; and below the visible coke fines intervals are shown on Figures 5.5.9-5 through 5.5.9-7, respectively.

Iron, lead and manganese concentrations are consistent with background since the maximum concentration does not exceed the maximum concentration in the background data set.

Nickel is naturally present in coke and the native soils across the United States. Nickel was detected in 9 of 42 soil samples at concentrations ranging from 6 mg/kg to 65 mg/kg. Background/reference area concentrations for nickel ranged from 2.5 mg/kg to 21.4 mg/kg. The XRF instrument was not able to detect nickel at the background concentrations so the comparison to background is uncertain.

Nickel was evaluated in the 5 samples collected at the perimeter of the Coke Fines Area and the 3 samples collected from below the discolored soil interval with the XRF instrument in 2009. The correlation coefficient (i.e., 0.62) did not meet the required 0.7 limit (*see* Section 5.4.2). As correlated nickel concentrations are not presented in the final data set. Nickel was not detected by the XRF instrument in 4 of 5 perimeter samples or the 3 samples collected below the discolored soils. Nickel was detected by the XRF instrument at perimeter sample CF-34 at 160 J mg/kg. If the linear

regression equation for nickel (y = 0.55 x +5.1; see Section 5.4.2) was applied to the XRF concentration, the nickel concentration would be 93.1 J mg/kg.

5.5.9.2.1.3 Group C

The metals included in Group C are selenium, silver, uranium, vanadium and zinc. The distribution of these metal constituents in the 0 to 2-inch; the 2 to 12-inch; and below the visible coke fines intervals are shown on Figures 5.5.9-8 through 5.5.9-10, respectively.

Selenium concentrations are consistent with background concentrations.

Silver was detected in 4 of 14 soil samples at concentrations ranging from not detected at 0.5 mg/kg to 9 mg/kg. The maximum concentration was reported for the 0-2 inch interval at CF-34. Elevated concentrations for silver are not widely distributed across this SWMU.

Silver was not detected in samples from the 2 to 12-inch interval at a detection limit of 0.5 mg/kg and silver was not detected in samples for the interval below the discolored soils at a detection limit of 1 mg/kg. Background/reference area concentrations for silver ranged from 0.2 j mg/kg to 2.1 mg/kg. Silver was not sufficiently detected in the background/reference area samples to perform statistical evaluations, so the maximum detected concentration was selected (i.e., 2.1 mg/kg).
Silver does not exceed background values for the 2 to 12-inch interval and the interval below the coke fines.

Uranium was detected in 7 of 14 soil samples at concentrations ranging from 2.0 mg/kg to 76 mg/kg. The maximum uranium concentration exceeds the maximum concentration in the background data set, so uranium is considered above background. Uranium was not detected in the soil samples collected below the coke fines containing soils or in 4 of the 5 soil samples collected at the perimeter of the Coke Fines Area. The maximum concentration was reported in sample CF-34. Uranium was not detected in CF-33 which is located further outside the Coke Fines Area.

Vanadium was detected in 9 of 14 soil samples at concentrations ranging from not detected at 2.0 mg/kg to 375 mg/kg. The maximum vanadium concentration exceeds the maximum concentration in the background data set, so vanadium is considered above background. Similar to uranium, vanadium was not detected in the soil samples collected below the coke fines containing soils. The maximum concentration was reported in sample CF-34. Vanadium was detected in 3 of 5 perimeter soil samples. The highest vanadium concentration for the perimeter was reported at CF-34 (375 mg/kg).

Zinc is naturally present in coke and the native soils across the United States. Zinc was detected in 49 of 49 soil samples at concentrations ranging from 29 mg/kg to 1,440 mg/kg. The mean detected concentration across the SWMU in the 0 to 2-inch interval was 180 mg/kg and the maximum was 1,440 mg/kg. The mean detected concentration in the 2 to 12-inch interval was 104 mg/kg and the maximum was 440 mg/kg. The mean detected concentration in the interval below the discolored soils was 29 mg/kg and the maximum was 31 mg/kg. Background/reference area concentrations for zinc ranged from 23.8 mg/kg to 63 mg/kg with a mean concentration of 38.7 mg/kg.

Zinc concentrations in the 0-2 and 2-12 inch intervals exceed both of the respective background values. Zinc is considered above background. Zinc does not exceed the background values in the interval below the discolored soil.

The maximum background concentration was exceeded in 1 of 5 perimeter samples with CF-34 reporting the highest concentration (1,440 mg/kg). Zinc was not detected in the soil samples below the soil containing coke fines.

5.5.9.2.1.4 Group D

The metals included in Group D are antimony, barium, beryllium, cobalt, mercury and thallium. The distribution of these metal constituents in the 0 to 2-inch and the 2 to 12-inch intervals are shown on Figures 5.5.9-11 and 5.5.9-12, respectively. Group D metals were not analyzed in samples from the interval below the discolored soils. The concentrations for the Group D metals are consistent with the background concentrations.

5.5.9.2.1.5 Metals - Group E

The metals included in Group E are calcium, magnesium, potassium and sodium. The distribution of these metal constituents in the 0 to 2-inch and the 2 to 12-inch intervals are shown on Figures 5.5.9-13 and 5.5.9-14, respectively. Group E metals were not analyzed in samples from the interval below the discolored soils. Group E metals are not hazardous constituents, and calcium is the only group E metal that is present at concentrations above background concentrations.

5.5.9.2.1.6 Metals Delineation

The following metals were identified as above background based on comparison to the background/reference area values: chromium, nickel, silver, uranium, vanadium, and zinc. Note, however, that there is no direct or consistent association between these metals and coke fines presence or absence. Four samples were collected from outside the visually-defined Coke Fines Area (CF-30, CF-31, CF-32, and CF-34). The analytical results for three of the four samples are

consistent with background values. The fourth sample (CF-34) reported metals concentrations consistently above background values. As detailed in Section 5.5.9.2.3, CF-34 has a radionuclide profile similar to slag. Slag also has elevated concentrations for many of these metals. This location may be impacted by slag.

5.5.9.2.2 SVOCs

The SVOC data is presented in Table 5.5.9-2. The SVOCs detected in the SWMU 9 samples belong to a subgroup of SVOCs known as PAHs. These multi-benzene-ringed compounds are naturally present in coke, and are also produced during the coking process. EPA has identified seven PAH constituents as potentially carcinogenic to humans. These potential carcinogens are identified as cPAHs. The other 10 PAH compounds below are considered by the EPA as not cancer-causing constituents and are identified as nPAHs.

Although PAHs are ubiquitous in the environment (e.g. from forest fires), Montana has not published background concentrations. For the purposes of this SWMU evaluation, background is considered below detection limits. Accordingly, the PAHs detected in the SWMU samples are considered above background. Risk assessment will be necessary to evaluate whether the potential exposure to the detected concentrations represents a unacceptable risk to human health or the environment.

5.5.9.2.2.1 cPAHs - Group A

The cPAHs included in Group A are benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluroanthene and benzo(k)fluoranthene. All of these cPAHs were detected in one or more samples from the SWMU and are considered above background. The distribution of these cPAH constituents in the 0 to 2-inch, the 2 to 12-inch, and below the visible coke fines intervals (i.e., discolored soils) are shown on Figures 5.5.9-15 through 5.5.9-17, respectively. A diagram showing the general trend with depth is shown on Figure 5.5.9-30 and depicts the benzo(a)anthracene concentration profile as an example for the trends for the cPAHs – Group A.

The concentrations for each of these cPAHs decreases with depth and the cPAHs were not detected in the samples from the interval below the discolored soils (*see* Table 5.5.9-2 and Figure 5.5.9-30). These cPAHs were also not detected in 3 of the 5 soil samples collected outside the Coke Fines Area. These cPAHs were detected in samples CF-33 and CF-34. The concentrations in CF-33 are about an order of magnitude lower than the concentrations for CF-34.

5.5.9.2.2.2 cPAHs - Group B

The cPAHs included in Group B are chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene. The distribution of these cPAH constituents in the 0 to 2-inch; the 2 to 12-inch; and below the visible coke fines intervals are shown on Figures 5.5.9-18 through 5.5.9-20, respectively. A diagram showing the general trend with depth is shown on Figure 5.5.9-31 and depicts the chrysene concentration profile as an example for the trends for the cPAHs – Group B.

The concentrations for each of these cPAHs decreases with depth and the cPAHs were not detected in the samples from the interval below the discolored soils (*see* Table 5.5.9-2 and Figure 5.5.9-31). These cPAHs were also not detected in 3 of the 5 soil samples collected outside the Coke Fines Area. These cPAHs were detected in samples CF-33 and CF-34. The concentrations in CF-33 are about an order of magnitude lower than the concentrations for CF-34.

5.5.9.2.2.3 nPAHs - Group A

The nPAHs included in Group A are acenaphthene, acenaphthylene, anthracene, benzo(g,h,i)perylene and fluoranthene. The distribution of these nPAH constituents in the 0 to 2-inch; the 2 to 12-inch; and below the visible coke fines intervals are shown on Figures 5.5.9-21 through 5.5.9-23, respectively. A diagram showing the general trend with depth is shown on Figure 5.5.9-32 and depicts the acenaphthene concentration profile as an example for the trends for the nPAHs – Group A.

As with the cPAHs, the concentrations for each of these nPAHs decreases with depth and the nPAHs were not detected in the samples from the interval below the discolored soils *(see* Table 5.5.9-2 and Figure 5.5.9-32). These nPAHs were also not detected in 3 of the 5 soil samples collected outside the Coke Fines Area with the exception of fluoranthene. Fluoranthene was also detected in the samples from CF-30 and 31.

5.5.9.2.2.4 nPAHs - Group B

The nPAHs included in Group A are 2-methylnaphthalene, fluorene, naphthalene, phenanthrene, and pyrene. The distribution of these nPAH constituents in the 0 to 2-inch; the 2 to 12-inch; and below the visible coke fines intervals are shown on Figures 5.5.9-24 through 5.5.9-26, respectively. A diagram showing the general trend with depth is shown on Figure 5.5.9-33 and depicts the naphthalene concentration profile as an example for the trends for the nPAHs – Group B.

The same decreasing trend is observed with this subset of nPAHs; the concentrations for each of these nPAHs decreases with depth and the nPAHs were not detected in the samples from the interval

below the discolored soils (*see* Table 5.5.9-2 and Figure 5.5.9-33). These nPAHs were also not detected in 3 of the 5 soil samples collected outside the Coke Fines Area. These nPAHs were detected in samples CF-33 and CF-34. The concentrations in CF-33 are about an order of magnitude lower than the concentrations for CF-34.

5.5.9.2.2.5 PAH Delineation

The PAH detected in the SWMU samples are considered above background. The PAH distribution may be broadly characterized as matching the visible extent of the coke fines. In general, PAH concentrations decrease in depth and were not detected in the samples collected below the soils containing coke fines. PAH compounds were not detected in three of the five perimeter samples. PAH concentrations were reported in the fourth sample (CF-34) at concentrations an order of magnitude below samples from within the visible coke fines limits. Even lower PAH concentrations were reported in the CF-33 sample, which was collected from a location that may contain some windblown coke fines. The visual delineation of the Coke Fines Area (both vertically and horizontally) is confirmed by analytical data.

5.5.9.2.3 Radionuclides

Radionuclides were evaluated at 5 locations around the perimeter of SWMU 9. These samples were collected from the surface soil (0 – 2 inch) interval. The radionuclide data are presented in Table 5.5.9-3. The distribution of radionuclides in the 0 to 2-inch interval is shown on Figure 5.5.9-27. Radionuclide concentrations are consistent with background concentrations with the exception of CF-34. The sample location has elevated concentrations of Th-230, U-234 and U-238, which is similar to the radionuclide profile for slag (*see* Section 5.5.12). The typical concentrations for these radionuclides in slag samples are summarized below:

Radionuclide	Typical Concentration
Pb-210	1 pCi/g
Ra-226	28 pCi/g
Th-230	47 pCi/g
U234	24 pCi/g
U238	24 pCi/g

The Coke Fines Area is adjacent to the Coarse Slag Pile and the Granulated Slag Pile and slag operations may have deposited some material near CF-34. The radionuclide concentrations for the other samples in SWMU 9 were consistent with background/reference area concentrations. Thus, radionuclides are not considered to be a signature of coke fines.

The 1999 Radiological Assessment study (*see* Appendix 1-G in Section 1.0) identified a pile of nodular ore located near the Coke Fines Area (*see* Figure 5.5.9-1b). This material (sample name ORE1) was analyzed for certain radionuclides and the results are summarized in Table 5.5.9-4. As detailed in Section 5.5.6, phosphate ore contains naturally-occurring radioactive materials (NORM) consisting of U-238 and its decay chain constituents. Although the nodular ore pile is no longer present, residual nodular ore fines may remain near CF-34.

5.5.9.3 Conclusions

The following conclusions were developed based on review of the information presented in this section:

- Coke fines are limited to the area delineated by CF-30, CF-31, CF-32 and CF-34 and to a depth of about 2-foot or less, based on the test trenches installed in the area. PAH constituents are indicative of coke fines as they were present in the samples that contained coke fines. PAH constituents were not detected in samples collected below the coke fines interval. PAHs were either not detected in the samples collected from outside the perimeter of the coke fines impacted soil or were detected at concentrations about an order of magnitude lower than samples within the Coke Fines Area (i.e., CF-34 0-2 inch). Even lower concentrations were detected in the CF-33 0-2 inch sample.

- The following metals are considered above background because the mean and maximum concentrations are above the mean and maximum of the background/reference area concentrations: chromium, nickel, silver, uranium, vanadium, and zinc. However, none of these metals appear to be directly associated with the coke fines. A risk assessment is needed to determine if any of these metals are constituents of potential concern. CF-34 may be impacted by slag.

- The PAH constituents identified in section 5.5.9.2.2 are consistent with constituents found in coke, and are considered above background. In general, PAH concentrations decreased with depth and were not detected in the samples collected below the discolored soils (i.e., CF-14 (16-22 inches), CF-16 (4-12 inches), CF-20 (6-12 inches)) as depicted on the diagrams for the respective PAH group (*see* Figure 5.5.9-30 thru 5.5.9-33).

- Radionuclides, with the exception of CF-34, are not elevated compared to the background/reference area data set and do not appear to be associated with the coke fines. Sample CF-34 0-2 inches has a radionuclide profile similar to slag. This sample may have

contained some slag as the SWMU is adjacent to the Coarse Slag Pile and Granulated Slag Pile and slag operations may have deposited some slag near CF-34. The radionuclide concentrations for the other samples were consistent with background/reference area concentrations.

There is sufficient information to conduct the risk assessment for this SWMU. The vertical and horizontal limits of the coke fines have been identified and the hazard constituents have been characterized. The risk assessment will identify which parameters, if any, are present at concentrations that warrant corrective measures. The dataset would be reviewed at that time and additional sampling may be necessary to inform the corrective measures study or later during the corrective measures design phase.

5.5.9.4 References

U.S. EPA. 2002. Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites. U.S. Environmental Protection Agency. EPA 540-R-01-003. OSWER 9285.7-41. September 2002

Tables

Table 5.5.9-1
Soil Data - Metals
SWMU 9
Rhodia Silver Bow Plant
[concentrations in mg/kg]

Chemical Name / Analysis Location				Antimony Lab	Arsenic Lab	Barium Lab	Beryllium Lab	Cadmium Lab	Calcium Lab	Chromium Lab	Cobalt Lab	Copper Lab	Iron Lab	Lead Lab	Magnesium Lab	Manganese Lab	Mercury Lab	Nickel Lab	Potassium Lab	Selenium Lab	Silver Lab	Sodium Lab	Thallium Lab	Uranium Lab	Vanadium Lab	Zinc Lab
Background Mean, Exceedances **Bold**				0.50	**23**	150	0.51	**1.6**	**3900**	**11**	5.9	**35**	19600	**17**	3500	**540**	**0.021**	**5.3**	3000	0.41	**0.73 (1)**	**140**	0.35	**1.8**	**41**	**59**
Background Maximum, Exceedances Underline				3.9	120	290	1.3	8.9	14000	48	9.5	300	35300	190	5700	1100	0.20	21	5300	0.70	1.7 (1)	620	1.0	4.1	83	380
Background 95% UPL, Exceedances *Italic*				*1.0*	*40*	*170*	*0.546*	*1.057*	*4500*	*12.46*	*6.145*	*63.87*	*20600*	*34.98*	*3700*	*570*	*0.0381*	*5.962*	*3200*	*0.47*	*(1)*	*215.6*	*0.462*	*2.0*	*43.3*	*98.46*
Location ID	**Sample Date**	**Depth**	**Sample Type**																							
CF-4	09/14/2006	0 - 2 in	N	--	20 J	--	--	< 48	--	< 150	--	**45 J**	7900	1 J	--	--	--	< 35	--	--	--	--	--	--	--	***160***
CF-4	09/14/2006	2 - 12 in	N	--	**36**	--	--	< 54	--	< 160	--	***64 J***	8800	11 J	--	--	--	< 42	--	--	--	--	--	--	--	***110 J***
CF-6	09/14/2006	0 - 2 in	N	--	9 J	--	--	< 61	--	***370 J***	--	***77 J***	7000	2 J	--	--	--	< 58	--	--	--	--	--	--	--	***650***
CF-6	09/14/2006	2 - 12 in	N	--	8 J	--	--	< 57	--	***270 J***	--	***73 J***	7600	< 1	--	--	--	***65 J***	--	--	--	--	--	--	--	***440***
CF-8	09/14/2006	0 - 2 in	N	--	15 J	--	--	< 57	--	< 170	--	**59 J**	10000	**23 J**	--	--	--	< 48	--	--	--	--	--	--	--	***100 J***
CF-8	09/14/2006	2 - 12 in	N	--	**29 J**	--	--	< 57	--	***180 J***	--	**57 J**	10000	17 J	--	--	--	< 51	--	--	--	--	--	--	--	***130 J***
CF-8	05/20/2009	2 - 12 in	N	--	**37.9**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CF-9	09/14/2006	0 - 2 in	N	--	8 J	--	--	< 46	--	< 140	--	**44 J**	7600	< 1	--	--	--	< 31	--	--	--	--	--	--	--	***100***
CF-9	09/14/2006	2 - 12 in	N	--	4 J	--	--	< 43	--	< 130	--	**37 J**	5900	< 1	--	--	--	< 25	--	--	--	--	--	--	--	50 J
CF-10	09/14/2006	0 - 2 in	N	--	19 J	--	--	< 55	--	< 170	--	**54 J**	10000	< 1	--	--	--	< 45	--	--	--	--	--	--	--	***140***
CF-10	09/14/2006	2 - 12 in	N	--	18 J	--	--	< 54	--	< 170	--	< 44	9700	3 J	--	--	--	< 43	--	--	--	--	--	--	--	**90 J**
CF-12	09/14/2006	0 - 2 in	N	--	***62***	--	--	< 55	--	< 160	--	***100 J***	9100	***61 J***	--	--	--	< 45	--	--	--	--	--	--	--	***130 J***
CF-12	09/14/2006	2 - 12 in	N	--	< 8	--	--	< 59	--	< 180	--	**50 J**	10300	15 J	--	--	--	< 52	--	--	--	--	--	--	--	***100 J***
CF-14	09/14/2006	0 - 2 in	N	< 2 R	5 J	42 J	< 2 J	***6.8 J***	***35100 J***	***52 J***	< 2 J	20 J	7140 J	11 J	753 J	235 J	< 0.1	***12 J***	756 R	< 2 J	***0.8 J***	***469 J***	< 2 J	***17 J***	***83 J***	**92 J**
CF-14	09/14/2006	0 - 2 in	N	--	4 J	--	--	< 48	--	< 150	--	< 40	7900	1 J	--	--	--	< 34	--	--	--	--	--	--	--	***100***
CF-14	09/14/2006	2 - 12 in	N	< 2 R	10 J	75 J	< 2 J	***3.1 J***	***14400 J***	***19 J***	3 J	**36 J**	8860 J	11 J	1760 J	225 J	< 0.1	***7 J***	1900 R	< 2 J	< 0.5 J	***320 J***	< 2 J	***8 J***	34 J	**64 J**
CF-14	09/14/2006	2 - 12 in	N	--	16 J	--	--	< 51	--	< 160	--	**44 J**	8200	1 J	--	--	--	< 40	--	--	--	--	--	--	--	**90 J**
CF-14	05/13/2009	16 - 22 in	N	--	22 J	--	--	< 0.2	--	< 2	--	--	--	4 J	--	293	--	--	--	< 1	< 1	--	--	< 6	< 2	26 J
CF-15	09/14/2006	0 - 2 in	N	--	***53***	--	--	< 55	--	< 170	--	***77 J***	10000	**25 J**	--	--	--	< 45	--	--	--	--	--	--	--	***130 J***
CF-15	09/14/2006	2 - 12 in	N	--	***56***	--	--	< 55	--	< 170	--	***74 J***	9700	**30 J**	--	--	--	< 46	--	--	--	--	--	--	--	***170***
CF-16	09/14/2006	0 - 2 in	N	< 2 R	10 J	48 J	< 2 J	***4.2 J***	***17000 J***	***29 J***	2 J	28 J	10400 J	8 J	811 J	133 J	< 0.1	***10 J***	1280 R	< 2 J	*0.6 J*	***247 J***	< 2 J	***10 J***	***58 J***	**83 J**
CF-16	09/14/2006	0 - 2 in	N	--	12 J	--	--	< 48	--	< 150	--	**45 J**	8800	< 1	--	--	--	< 33	--	--	--	--	--	--	--	***150***
			FD	< 2 R	9 J	67 J	< 2 J	***4.4 J***	***17100 J***	***26 J***	2 J	27 J	9730 J	8 J	825 J	133 J	***0.1***	***9 J***	1270 R	< 2 J	*0.5 J*	***262 J***	< 2 J	***10 J***	***52 J***	**82 J**
CF-16	09/14/2006	2 - 12 in	N	< 2 R	3 J	140 J	< 2 J	< 0.5 J	***4600 J***	8 J	3 J	12 J	9860 J	5 J	2620 J	220 J	< 0.1	***6 J***	2610 R	< 2 J	< 0.5 J	**159 J**	< 2 J	***2 J***	22 J	29 J
CF-16	09/14/2006	2 - 12 in	N	--	6 J	--	--	< 56	--	< 170	--	< 45	10000	< 1	--	--	--	< 48	--	--	--	--	--	--	--	**60 J**
			FD	< 2 R	4 J	148 J	< 2 J	< 0.5 J	***5010 J***	9 J	4 J	12 J	10400 J	5 J	2570 J	235 J	< 0.1	***6 J***	2530 R	< 2 J	< 0.5 J	**162 J**	< 2 J	***3 J***	23 J	30 J
CF-16	05/13/2009	4 - 12 in	N	--	< 11	--	--	< 0.2	--	< 2	--	--	--	8 J	--	300	--	--	--	< 0.7	< 1	--	--	< 5	< 2	30 J
CF-17	09/14/2006	0 - 2 in	N	--	9 J	--	--	< 46	--	< 150	--	**41 J**	7600	< 1	--	--	--	< 30	--	--	--	--	--	--	--	***100***
CF-17	09/14/2006	2 - 12 in	N	--	5 J	--	--	< 44	--	< 140	--	**41 J**	6700	1 J	--	--	--	< 28	--	--	--	--	--	--	--	**70**
CF-18	09/14/2006	0 - 2 in	N	--	8 J	--	--	< 45	--	< 140	--	< 37	6700	< 1	--	--	--	< 27	--	--	--	--	--	--	--	**60 J**
CF-18	09/14/2006	2 - 12 in	N	--	5 J	--	--	< 51	--	< 150	--	< 41	8200	< 1	--	--	--	< 39	--	--	--	--	--	--	--	**90 J**
CF-19	09/14/2006	0 - 2 in	N	--	***62***	--	--	< 54	--	< 160	--	***120***	10000	***39 J***	--	--	--	< 43	--	--	--	--	--	--	--	***180***
CF-19	09/14/2006	2 - 12 in	N	--	***54***	--	--	< 59	--	< 180	--	***100 J***	12100	***41 J***	--	--	--	< 51	--	--	--	--	--	--	--	***180***
CF-20	09/14/2006	0 - 2 in	N	< 2 R	**35 J**	48 J	< 2 J	***4.8 J***	***17300 J***	***33 J***	< 2 J	***65 J***	5960 J	**28 J**	689 J	118 J	< 0.1	***8 J***	1120 R	< 2 J	***0.8 J***	***288 J***	< 2 J	***9 J***	***51 J***	**97 J**
CF-20	09/14/2006	0 - 2 in	N	--	**33**	--	--	< 48	--	< 150	--	***73 J***	7300	**24 J**	--	--	--	< 33	--	--	--	--	--	--	--	***120***
CF-20	09/14/2006	2 - 12 in	N	< 2 R	10 J	92 J	< 2 J	***2.6 J***	***14900 J***	***25 J***	3 J	25 J	9710 J	10 J	1480 J	276 J	< 0.1	***8 J***	1990 R	< 2 J	< 0.5 J	***302 J***	< 2 J	***8 J***	**43 J**	**70 J**
CF-20	09/14/2006	2 - 12 in	N	--	12 J	--	--	< 51	--	< 160	--	< 41	7900	2 J	--	--	--	< 39	--	--	--	--	--	--	--	***110***
CF-20	05/13/2009	6 - 12 in	N	--	13 J	--	--	< 0.2	--	< 2	--	--	--	5 J	--	375	--	--	--	< 1	< 1	--	--	< 7	< 2	31 J
CF-25	09/14/2006	0 - 2 in	N	--	18 J	--	--	< 51	--	< 170	--	**54 J**	8500	11 J	--	--	--	< 39	--	--	--	--	--	--	--	***100 J***
CF-25	09/14/2006	2 - 12 in	N	--	9 J	--	--	< 44	--	< 140	--	< 37	6300	1 J	--	--	--	< 26	--	--	--	--	--	--	--	30 J
CF-27	09/14/2006	0 - 2 in	N	--	13 J	--	--	< 48	--	< 150	--	< 40	7600	2 J	--	--	--	< 36	--	--	--	--	--	--	--	***140***
CF-27	09/14/2006	2 - 12 in	N	--	14 J	--	--	< 56	--	< 160	--	< 47	9400	8 J	--	--	--	< 46	--	--	--	--	--	--	--	**80 J**
CF-28	09/14/2006	0 - 2 in	N	--	7 J	--	--	< 48	--	***160 J***	--	**48 J**	8500	1 J	--	--	--	< 34	--	--	--	--	--	--	--	***170***
CF-28	09/14/2006	2 - 12 in	N	--	***76***	--	--	< 55	--	< 170	--	***78 J***	9400	**31 J**	--	--	--	< 44	--	--	--	--	--	--	--	***120 J***
CF-29	09/14/2006	0 - 2 in	N	--	6 J	--	--	< 42	--	< 140	--	< 35	6700	< 1	--	--	--	< 24	--	--	--	--	--	--	--	40 J
CF-29	09/14/2006	2 - 12 in	N	--	**24 J**	--	--	< 52	--	< 160	--	**55 J**	8500	7 J	--	--	--	< 40	--	--	--	--	--	--	--	**80 J**
CF-30	05/20/2009	0 - 2 in	N	--	***63***	--	--	< 0.2	--	< 2	--	--	--	***35***	--	510	--	--	--	< 0.7	< 1	--	--	< 6	< 2	***109***
CF-31	05/20/2009	0 - 2 in	N	--	13 J	--	--	< 0.2	--	< 2	--	--	--	13 J	--	495	--	--	--	< 1	< 1	--	--	< 8	***45 J***	39
CF-32	05/20/2009	0 - 2 in	N	--	***82.9***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CF-32	05/20/2009	0 - 2 in	N	--	***88***	--	--	< 0.2	--	< 2	--	--	--	**26**	--	***653***	--	--	--	< 1	< 1	--	--	< 6	< 2	**75**
CF-33	05/20/2009	0 - 2 in	N	--	***101***	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CF-33	05/20/2009	0 - 2 in	N	--	***88***	--	--	< 0.2	--	< 2	--	--	--	**34**	--	488	--	--	--	< 1	< 1	--	--	< 5	30 J	***102***
CF-34	05/21/2009	0 - 2 in	N	--	19 J	--	--	***4 J***	--	***278***	--	--	--	**33**	--	143 J	--	--	--	< 3	***9 J***	--	--	***76***	***375***	***1440***

Table 5.5.9-2
Soil Data - SVOCs
SWMU 9
Rhodia Silver Bow Plant
[concentrations in mg/kg]

Chemical Name				1,2,4-Trichlorobenzene	1,2-Dichlorobenzene	1,2-Diphenylhydrazine	1,3-Dichlorobenzene	1,4-Dichlorobenzene	1-Methylnaphthalene	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene
Location ID	Sample Date	Depth	Sample Type													
CF-14	09/14/2006	0 - 2 in	N	< 0.34	< 0.34	--	< 0.34	< 0.34	**0.16 J**	< 0.34	< 0.34	< 0.34	< 0.34	< 1.7	< 0.34	< 0.34
CF-14	09/14/2006	2 - 12 in	N	< 0.36	< 0.36	--	< 0.36	< 0.36	**0.091 J**	< 0.36	< 0.36	< 0.36	< 0.36	< 1.8	< 0.36	< 0.36
CF-14	05/13/2009	16 - 22 in	N	< 0.011	< 0.018	< 0.015	< 0.019	< 0.018	--	< 0.018	< 0.015	< 0.017	< 0.016	< 0.12	< 0.015	< 0.016
CF-16	09/14/2006	0 - 2 in	N	< 0.34	< 0.34	--	< 0.34	< 0.34	**0.19 J**	< 0.34	< 0.34	< 0.34	< 0.34	< 1.7	< 0.34	< 0.34
			FD	< 0.34	< 0.34	--	< 0.34	< 0.34	**0.23 J**	< 0.34	< 0.34	< 0.34	< 0.34	< 1.7	< 0.34	< 0.34
CF-16	09/14/2006	2 - 12 in	N	< 0.36	< 0.36	--	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	< 1.8	< 0.36	< 0.36
			FD	< 0.36	< 0.36	--	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	< 1.8	< 0.36	< 0.36
CF-16	05/13/2009	4 - 12 in	N	< 0.011	< 0.018	< 0.015	< 0.019	< 0.018	--	< 0.018	< 0.015	< 0.017	< 0.016	< 0.12	< 0.015	< 0.016
CF-20	09/14/2006	0 - 2 in	N	< 0.34	< 0.34	--	< 0.34	< 0.34	**0.098 J**	< 0.34	< 0.34	< 0.34	< 0.34	< 1.7	< 0.34	< 0.34
CF-20	09/14/2006	2 - 12 in	N	< 0.35	< 0.35	--	< 0.35	< 0.35	**0.10 J**	< 0.35	< 0.35	< 0.35	< 0.35	< 1.7	< 0.35	< 0.35
CF-20	05/13/2009	6 - 12 in	N	< 0.011	< 0.018	< 0.015	< 0.019	< 0.018	--	< 0.018	< 0.015	< 0.017	< 0.016	< 0.12	< 0.015	< 0.016
CF-30	05/20/2009	0 - 2 in	N	< 0.011	< 0.018	< 0.015	< 0.019	< 0.018	--	< 0.018	< 0.015	< 0.017 R	< 0.016	< 0.12	< 0.015	< 0.016
CF-31	05/20/2009	0 - 2 in	N	< 0.011	< 0.018	< 0.015	< 0.019	< 0.018	--	< 0.018	< 0.015	< 0.017	< 0.016	< 0.12	< 0.015	< 0.016
CF-32	05/20/2009	0 - 2 in	N	< 0.011	< 0.018	< 0.015	< 0.019	< 0.018	--	< 0.018	< 0.015	< 0.017 R	< 0.016	< 0.12	< 0.015	< 0.016
CF-33	05/20/2009	0 - 2 in	N	< 0.011	< 0.018	< 0.015	< 0.019	< 0.018	--	< 0.018	< 0.015	< 0.017 R	< 0.016	< 0.12	< 0.015	< 0.016
CF-34	05/21/2009	0 - 2 in	N	< 0.011	< 0.018	< 0.015	< 0.019	< 0.018	--	< 0.018 R	< 0.015 R	< 0.017 R	< 0.016 R	< 0.12 R	< 0.015	< 0.016

Table 5.5.9-2
Soil Data - SVOCs
SWMU 9
Rhodia Silver Bow Plant
[concentrations in mg/kg]

			Chemical Name	2-Chloronaphthalene	2-Chlorophenol	2-Methyl-4,6-dinitrophenol	2-Methylnaphthalene	2-Nitroaniline	2-Nitrophenol	3,3`-Dichlorobenzidine	3-Nitroaniline	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenol	4-Chlorophenyl phenyl ether	4-Nitroaniline
Location ID	Sample Date	Depth	Sample Type														
CF-14	09/14/2006	0 - 2 in	N	< 0.34	< 0.34	< 1.7	**0.25 J**	--	< 0.34	< 0.67	--	< 0.34	< 0.34	--	< 0.34	< 0.34	--
CF-14	09/14/2006	2 - 12 in	N	< 0.36	< 0.36	< 1.8	**0.12 J**	--	< 0.36	< 0.72	--	< 0.36	< 0.36	--	< 0.36	< 0.36	--
CF-14	05/13/2009	16 - 22 in	N	< 0.010	< 0.0099	< 0.15	< 0.011	< 0.017	< 0.014	< 0.027	< 0.18	< 0.013	< 0.017	< 0.015	--	< 0.016	< 0.18
CF-16	09/14/2006	0 - 2 in	N	< 0.34	< 0.34	< 1.7	**0.24 J**	--	< 0.34	< 0.67	--	< 0.34	< 0.34	--	< 0.34	< 0.34	--
			FD	< 0.34	< 0.34	< 1.7	**0.31 J**	--	< 0.34	< 0.67	--	< 0.34	< 0.34	--	< 0.34	< 0.34	--
CF-16	09/14/2006	2 - 12 in	N	< 0.36	< 0.36	< 1.8	< 0.36	--	< 0.36	< 0.71	--	< 0.36	< 0.36	--	< 0.36	< 0.36	--
			FD	< 0.36	< 0.36	< 1.8	< 0.36	--	< 0.36	< 0.71	--	< 0.36	< 0.36	--	< 0.36	< 0.36	--
CF-16	05/13/2009	4 - 12 in	N	< 0.010	< 0.0099	< 0.15	< 0.011	< 0.017	< 0.014	< 0.027	< 0.18	< 0.013	< 0.017	< 0.015	--	< 0.016	< 0.18
CF-20	09/14/2006	0 - 2 in	N	< 0.34	< 0.34	< 1.7	**0.14 J**	--	< 0.34	< 0.67	--	< 0.34	< 0.34	--	< 0.34	< 0.34	--
CF-20	09/14/2006	2 - 12 in	N	< 0.35	< 0.35	< 1.7	**0.14 J**	--	< 0.35	< 0.69	--	< 0.35	< 0.35	--	< 0.35	< 0.35	--
CF-20	05/13/2009	6 - 12 in	N	< 0.010	< 0.0099	< 0.15	< 0.011	< 0.017	< 0.014	< 0.027	< 0.18	< 0.013	< 0.017	< 0.015	--	< 0.016	< 0.18
CF-30	05/20/2009	0 - 2 in	N	< 0.010	< 0.0099 R	< 0.15	< 0.011	< 0.017	< 0.014	< 0.027	< 0.18	< 0.013	< 0.017 R	< 0.015	--	< 0.016	< 0.18
CF-31	05/20/2009	0 - 2 in	N	< 0.010	< 0.0099	< 0.15	< 0.011	< 0.017	< 0.014	< 0.027	< 0.18	< 0.013	< 0.017	< 0.015	--	< 0.016	< 0.18
CF-32	05/20/2009	0 - 2 in	N	< 0.010	< 0.0099 R	< 0.15	< 0.011	< 0.017	< 0.014	< 0.027	< 0.18	< 0.013	< 0.017 R	< 0.015	--	< 0.016	< 0.18
CF-33	05/20/2009	0 - 2 in	N	< 0.010	< 0.0099 R	< 0.15	< 0.011	< 0.017	< 0.014	< 0.027	< 0.18	< 0.013	< 0.017 R	< 0.015	--	< 0.016	< 0.18
CF-34	05/21/2009	0 - 2 in	N	< 0.010	< 0.0099 R	< 0.15 R	**0.026 J**	< 0.017	< 0.014 R	< 0.027	< 0.18	< 0.013	< 0.017 R	< 0.015	--	< 0.016	< 0.18

Table 5.5.9-2
Soil Data - SVOCs
SWMU 9
Rhodia Silver Bow Plant
[concentrations in mg/kg]

Chemical Name				4-Nitrophenol	Acenaphthene	Acenaphthylene	Anthracene	Azobenzene	Benzidine	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Benzoic acid	Benzyl alcohol	Bis(2-chloroethoxy)methane	Bis(2-chloroethyl)ether
Location ID	Sample Date	Depth	Sample Type															
CF-14	09/14/2006	0 - 2 in	N	< 1.7	**0.19 J**	**0.91**	**0.83**	< 0.34	< 0.67	**4.6**	**5.2**	**6.4**	**4.5**	**1.8**	--	--	< 0.34	< 0.34
CF-14	09/14/2006	2 - 12 in	N	< 1.8	**0.11 J**	**0.37**	**0.44**	< 0.36	< 0.72	**2.5**	**2.9**	**3.5**	**2.6**	**1.4**	--	--	< 0.36	< 0.36
CF-14	05/13/2009	16 - 22 in	N	< 0.15	< 0.014	< 0.016	< 0.014	--	< 0.42 R	< 0.013	< 0.020	< 0.018	< 0.021	< 0.020	< 0.14	< 0.017	< 0.011	< 0.012
CF-16	09/14/2006	0 - 2 in	N	< 1.7	< 0.34	**0.25 J**	**0.35**	< 0.34	< 0.67	**1.4**	**1.6**	**2.2**	**1.4**	**1.1**	--	--	< 0.34	< 0.34
			FD	< 1.7	< 0.34	**0.24 J**	**0.33 J**	< 0.34	< 0.67	**1.3**	**1.4**	**2.1**	**1.3**	**0.77**	--	--	< 0.34	< 0.34
CF-16	09/14/2006	2 - 12 in	N	< 1.8	< 0.36	< 0.36	< 0.36	< 0.36	< 0.71	**0.18 J**	**0.20 J**	**0.35 J**	**0.21 J**	**0.12 J**	--	--	< 0.36	< 0.36
			FD	< 1.8	< 0.36	< 0.36	**0.070 J**	< 0.36	< 0.71	**0.22 J**	**0.24 J**	**0.37**	**0.23 J**	**0.16 J**	--	--	< 0.36	< 0.36
CF-16	05/13/2009	4 - 12 in	N	< 0.15	< 0.014	< 0.016	< 0.014	--	< 0.42 R	< 0.013	< 0.020	< 0.018	< 0.021	< 0.020	< 0.14	< 0.017	< 0.011	< 0.012
CF-20	09/14/2006	0 - 2 in	N	< 1.7	**0.092 J**	**0.42**	**0.38**	< 0.34	< 0.67	**2.3**	**2.6**	**3.7**	**2.3**	**0.90**	--	--	< 0.34	< 0.34
CF-20	09/14/2006	2 - 12 in	N	< 1.7	< 0.35	**0.30 J**	**0.33 J**	< 0.35	< 0.69	**1.7**	**1.8**	**2.8**	**1.6**	**1.0**	--	--	< 0.35	< 0.35
CF-20	05/13/2009	6 - 12 in	N	< 0.15	< 0.014	< 0.016	< 0.014	--	< 0.42 R	< 0.013	< 0.020	< 0.018	< 0.021	< 0.020	< 0.14	< 0.017	< 0.011	< 0.012
CF-30	05/20/2009	0 - 2 in	N	< 0.15	< 0.014	< 0.016	< 0.014	--	< 0.42 R	< 0.013	< 0.020	< 0.018	< 0.021	< 0.020	< 0.14	< 0.017	< 0.011	< 0.012
CF-31	05/20/2009	0 - 2 in	N	< 0.15	< 0.014	< 0.016	< 0.014	--	< 0.42 R	< 0.013	< 0.020	< 0.018	< 0.021	< 0.020	< 0.14	< 0.017	< 0.011	< 0.012
CF-32	05/20/2009	0 - 2 in	N	< 0.15	< 0.014	< 0.016	< 0.014	--	< 0.42 R	< 0.013	< 0.020	< 0.018	< 0.021	< 0.020	< 0.14	< 0.017	< 0.011	< 0.012
CF-33	05/20/2009	0 - 2 in	N	< 0.15	< 0.014	< 0.016	< 0.014	--	< 0.42 R	**0.030 J**	**0.034 J**	**0.045 J**	**0.027 J**	< 0.020	< 0.14	< 0.017	< 0.011	< 0.012
CF-34	05/21/2009	0 - 2 in	N	< 0.15 R	< 0.014	**0.019 J**	**0.022 J**	--	< 0.42 R	**0.13 J**	**0.14 J**	**0.23 J**	**0.15 J**	**0.086 J**	< 0.14 R	< 0.017	< 0.011	< 0.012

Table 5.5.9-2
Soil Data - SVOCs
SWMU 9
Rhodia Silver Bow Plant
[concentrations in mg/kg]

			Chemical Name	Bis(2-chloroisopropyl)ether	Bis(2-ethylhexyl)phthalate	Butyl benzyl phthalate	Carbazole	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Diethyl phthalate	Dimethyl phthalate	Di-n-butyl phthalate	Di-n-octyl phthalate	Fluoranthene	Fluorene	Hexachlorobenzene
Location ID	Sample Date	Depth	Sample Type														
CF-14	09/14/2006	0 - 2 in	N	< 0.34	< 0.34	< 0.34	--	**3.9**	**1.5**	--	< 0.34	< 0.34	< 0.34	< 0.34	**6.5**	< 0.34	< 0.34
CF-14	09/14/2006	2 - 12 in	N	< 0.36	< 0.36	< 0.36	--	**2.2**	**0.99**	--	< 0.36	< 0.36	< 0.36	< 0.36	**2.9**	**0.091 J**	< 0.36
CF-14	05/13/2009	16 - 22 in	N	< 0.015	< 0.019	< 0.017	< 0.012	< 0.012	< 0.028	< 0.012	< 0.015	< 0.017	< 0.013	< 0.024	< 0.012	< 0.013	< 0.015
CF-16	09/14/2006	0 - 2 in	N	< 0.34	< 0.34	< 0.34	--	**1.5**	**0.21 J**	--	< 0.34	< 0.34	< 0.34	< 0.34	**2.4**	**0.096 J**	< 0.34
			FD	< 0.34	< 0.34	< 0.34	--	**1.3**	**0.53**	--	< 0.34	< 0.34	< 0.34	< 0.34	**2.2**	**0.086 J**	< 0.34
CF-16	09/14/2006	2 - 12 in	N	< 0.36	< 0.36	< 0.36	--	**0.20 J**	< 0.36	--	< 0.36	< 0.36	< 0.36	< 0.36	**0.32 J**	< 0.36	< 0.36
			FD	< 0.36	< 0.36	< 0.36	--	**0.24 J**	**0.066 J**	--	< 0.36	< 0.36	< 0.36	< 0.36	**0.40**	< 0.36	< 0.36
CF-16	05/13/2009	4 - 12 in	N	< 0.015	< 0.019	< 0.017	< 0.012	< 0.012	< 0.028	< 0.012	< 0.015	< 0.017	< 0.013	< 0.024	< 0.012	< 0.013	< 0.015
CF-20	09/14/2006	0 - 2 in	N	< 0.34	< 0.34	< 0.34	--	**2.0**	**0.99**	--	< 0.34	< 0.34	< 0.34	< 0.34	**2.8**	**0.075 J**	< 0.34
CF-20	09/14/2006	2 - 12 in	N	< 0.35	< 0.35	< 0.35	--	**1.7**	**0.59**	--	< 0.35	< 0.35	< 0.35	< 0.35	**2.5**	**0.071 J**	< 0.35
CF-20	05/13/2009	6 - 12 in	N	< 0.015	< 0.019	< 0.017	< 0.012	< 0.012	< 0.028	< 0.012	< 0.015	< 0.017	< 0.013	< 0.024	< 0.012	< 0.013	< 0.015
CF-30	05/20/2009	0 - 2 in	N	< 0.015	< 0.019	< 0.017	< 0.012	< 0.012	< 0.028	< 0.012	< 0.015	< 0.017	< 0.013	< 0.024	**0.014 J**	< 0.013	< 0.015
CF-31	05/20/2009	0 - 2 in	N	< 0.015	< 0.019	< 0.017	< 0.012	< 0.012	< 0.028	< 0.012	< 0.015	< 0.017	< 0.013	< 0.024	**0.024 J**	< 0.013	< 0.015
CF-32	05/20/2009	0 - 2 in	N	< 0.015	< 0.019	< 0.017	< 0.012	< 0.012	< 0.028	< 0.012	< 0.015	< 0.017	< 0.013	< 0.024	< 0.012	< 0.013	< 0.015
CF-33	05/20/2009	0 - 2 in	N	< 0.015	< 0.019	< 0.017	< 0.012	**0.030 J**	< 0.028	< 0.012	< 0.015	< 0.017	< 0.013	< 0.024	**0.046 J**	< 0.013	< 0.015
CF-34	05/21/2009	0 - 2 in	N	< 0.015	< 0.019	< 0.017	**0.014 J**	**0.16 J**	**0.043 J**	**0.018 J**	< 0.015	< 0.017	< 0.013	< 0.024	**0.20 J**	< 0.013	< 0.015

Table 5.5.9-2
Soil Data - SVOCs
SWMU 9
Rhodia Silver Bow Plant
[concentrations in mg/kg]

			Chemical Name	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-cd)pyrene	Isophorone	m,p Cresols	Naphthalene	Nitrobenzene	N-Nitrosodimethylamine	N-Nitrosodi-n-propylamine	N-Nitrosodiphenylamine	o-Cresol	p-Cresol
Location ID	Sample Date	Depth	Sample Type													
CF-14	09/14/2006	0 - 2 in	N	< 0.34	< 0.68	< 0.34	**4.7**	< 0.34	< 0.34	**0.47**	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	--
CF-14	09/14/2006	2 - 12 in	N	< 0.36	< 0.72	< 0.36	**3.0**	< 0.36	< 0.36	**0.20 J**	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	--
CF-14	05/13/2009	16 - 22 in	N	< 0.015	< 0.013	< 0.022	< 0.039	< 0.014	--	< 0.015	< 0.027	< 0.026	< 0.020	< 0.018	< 0.017	< 0.017	
CF-16	09/14/2006	0 - 2 in	N	< 0.34	< 0.68	< 0.34	**1.8**	< 0.34	< 0.34	**0.34**	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	--
			FD	< 0.34	< 0.68	< 0.34	**1.7**	< 0.34	< 0.34	**0.39**	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	--
CF-16	09/14/2006	2 - 12 in	N	< 0.36	< 0.72	< 0.36	**0.42**	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	--
			FD	< 0.36	< 0.72	< 0.36	**0.47**	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	--
CF-16	05/13/2009	4 - 12 in	N	< 0.015	< 0.013	< 0.022	< 0.039	< 0.014	--	< 0.015	< 0.027	< 0.026	< 0.020	< 0.018	< 0.017	< 0.017	
CF-20	09/14/2006	0 - 2 in	N	< 0.34	< 0.68	< 0.34	**2.8**	< 0.34	< 0.34	**0.27 J**	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	--
CF-20	09/14/2006	2 - 12 in	N	< 0.35	< 0.70	< 0.35	**2.1**	< 0.35	< 0.35	**0.28 J**	< 0.35	< 0.35	< 0.35	< 0.35	< 0.35	< 0.35	--
CF-20	05/13/2009	6 - 12 in	N	< 0.015	< 0.013	< 0.022	< 0.039	< 0.014	--	< 0.015	< 0.027	< 0.026	< 0.020	< 0.018	< 0.017	< 0.017	
CF-30	05/20/2009	0 - 2 in	N	< 0.015	< 0.013	< 0.022	< 0.039	< 0.014	--	< 0.015	< 0.027	< 0.026	< 0.020	< 0.018	< 0.017	< 0.017	
CF-31	05/20/2009	0 - 2 in	N	< 0.015	< 0.013	< 0.022	< 0.039	< 0.014	--	< 0.015	< 0.027	< 0.026	< 0.020	< 0.018	< 0.017	< 0.017	
CF-32	05/20/2009	0 - 2 in	N	< 0.015	< 0.013	< 0.022	< 0.039	< 0.014	--	< 0.015	< 0.027	< 0.026	< 0.020	< 0.018	< 0.017	< 0.017	
CF-33	05/20/2009	0 - 2 in	N	< 0.015	< 0.013	< 0.022	< 0.039	< 0.014	--	< 0.015	< 0.027	< 0.026	< 0.020	< 0.018	< 0.017	< 0.017	
CF-34	05/21/2009	0 - 2 in	N	< 0.015	< 0.013	< 0.022	**0.16 J**	< 0.014	--	**0.047 J**	< 0.027	< 0.026	< 0.020	< 0.018	< 0.017 R	< 0.017 R	

Table 5.5.9-2
Soil Data - SVOCs
SWMU 9
Rhodia Silver Bow Plant
[concentrations in mg/kg]

			Chemical Name	Pentachlorophenol	Phenanthrene	Phenol	Pyrene	Pyridine
Location ID	Sample Date	Depth	Sample Type					
CF-14	09/14/2006	0 - 2 in	N	< 1.7	**2.6**	< 0.34	**5.3**	< 0.34
CF-14	09/14/2006	2 - 12 in	N	< 1.8	**1.5**	< 0.36	**2.6**	< 0.36
CF-14	05/13/2009	16 - 22 in	N	< 0.13	< 0.010	< 0.020	< 0.014	< 0.020
CF-16	09/14/2006	0 - 2 in	N	< 1.7	**1.4**	< 0.34	**2.1**	< 0.34
			FD	< 1.7	**1.3**	< 0.34	**1.9**	< 0.34
CF-16	09/14/2006	2 - 12 in	N	< 1.8	**0.18 J**	< 0.36	**0.28 J**	< 0.36
			FD	< 1.8	**0.24 J**	< 0.36	**0.35 J**	< 0.36
CF-16	05/13/2009	4 - 12 in	N	< 0.13	< 0.010	< 0.020	< 0.014	< 0.020
CF-20	09/14/2006	0 - 2 in	N	< 1.7	**1.3**	< 0.34	**2.4**	< 0.34
CF-20	09/14/2006	2 - 12 in	N	< 1.7	**1.2**	< 0.35	**2.2**	< 0.35
CF-20	05/13/2009	6 - 12 in	N	< 0.13	< 0.010	< 0.020	< 0.014	< 0.020
CF-30	05/20/2009	0 - 2 in	N	< 0.13	< 0.010	< 0.020	< 0.014	< 0.020 J
CF-31	05/20/2009	0 - 2 in	N	< 0.13	**0.013 J**	< 0.020	**0.021 J**	< 0.020 J
CF-32	05/20/2009	0 - 2 in	N	< 0.13	< 0.010	< 0.020	< 0.014	< 0.020 J
CF-33	05/20/2009	0 - 2 in	N	< 0.13	**0.026 J**	< 0.020	**0.039 J**	< 0.020 J
CF-34	05/21/2009	0 - 2 in	N	< 0.13 R	**0.11 J**	< 0.020 R	**0.18 J**	< 0.020 J

Table 5.5.9-2
Soil Data - SVOCs
SWMU 9
Rhodia Silver Bow Plant
[concentrations in mg/kg]

Chemical Name				Naphthalene	Nitrobenzene	N-Nitrosodimethylamine	N-Nitrosodi-n-propylamine	N-Nitrosodiphenylamine	o-Cresol	p-Cresol	Pentachlorophenol	Phenanthrene	Phenol	Pyrene	Pyridine
Location ID	Sample Date	Depth	Sample Type												
CF-14	09/14/2006	0 - 2 in	N	**0.47**	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	--	< 1.7	**2.6**	< 0.34	**5.3**	< 0.34
CF-14	09/14/2006	2 - 12 in	N	**0.20 J**	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	--	< 1.8	**1.5**	< 0.36	**2.6**	< 0.36
CF-14	05/13/2009	16 - 22 in	N	< 0.015	< 0.027	< 0.026	< 0.020	< 0.018	< 0.017	< 0.017	< 0.13	< 0.010	< 0.020	< 0.014	< 0.020
CF-16	09/14/2006	0 - 2 in	N	**0.34**	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	--	< 1.7	**1.4**	< 0.34	**2.1**	< 0.34
			FD	**0.39**	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	--	< 1.7	**1.3**	< 0.34	**1.9**	< 0.34
CF-16	09/14/2006	2 - 12 in	N	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	--	< 1.8	**0.18 J**	< 0.36	**0.28 J**	< 0.36
			FD	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	--	< 1.8	**0.24 J**	< 0.36	**0.35 J**	< 0.36
CF-16	05/13/2009	4 - 12 in	N	< 0.015	< 0.027	< 0.026	< 0.020	< 0.018	< 0.017	< 0.017	< 0.13	< 0.010	< 0.020	< 0.014	< 0.020
CF-20	09/14/2006	0 - 2 in	N	**0.27 J**	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	--	< 1.7	**1.3**	< 0.34	**2.4**	< 0.34
CF-20	09/14/2006	2 - 12 in	N	**0.28 J**	< 0.35	< 0.35	< 0.35	< 0.35	< 0.35	--	< 1.7	**1.2**	< 0.35	**2.2**	< 0.35
CF-20	05/13/2009	6 - 12 in	N	< 0.015	< 0.027	< 0.026	< 0.020	< 0.018	< 0.017	< 0.017	< 0.13	< 0.010	< 0.020	< 0.014	< 0.020
CF-30	05/20/2009	0 - 2 in	N	< 0.015	< 0.027	< 0.026	< 0.020	< 0.018	< 0.017	< 0.017	< 0.13	< 0.010	< 0.020	< 0.014	< 0.020 J
CF-31	05/20/2009	0 - 2 in	N	< 0.015	< 0.027	< 0.026	< 0.020	< 0.018	< 0.017	< 0.017	< 0.13	**0.013 J**	< 0.020	**0.021 J**	< 0.020 J
CF-32	05/20/2009	0 - 2 in	N	< 0.015	< 0.027	< 0.026	< 0.020	< 0.018	< 0.017	< 0.017	< 0.13	< 0.010	< 0.020	< 0.014	< 0.020 J
CF-33	05/20/2009	0 - 2 in	N	< 0.015	< 0.027	< 0.026	< 0.020	< 0.018	< 0.017	< 0.017	< 0.13	**0.026 J**	< 0.020	**0.039 J**	< 0.020 J
CF-34	05/21/2009	0 - 2 in	N	**0.047 J**	< 0.027	< 0.026	< 0.020	< 0.018	< 0.017 R	< 0.017 R	< 0.13 R	**0.11 J**	< 0.020 R	**0.18 J**	< 0.020 J

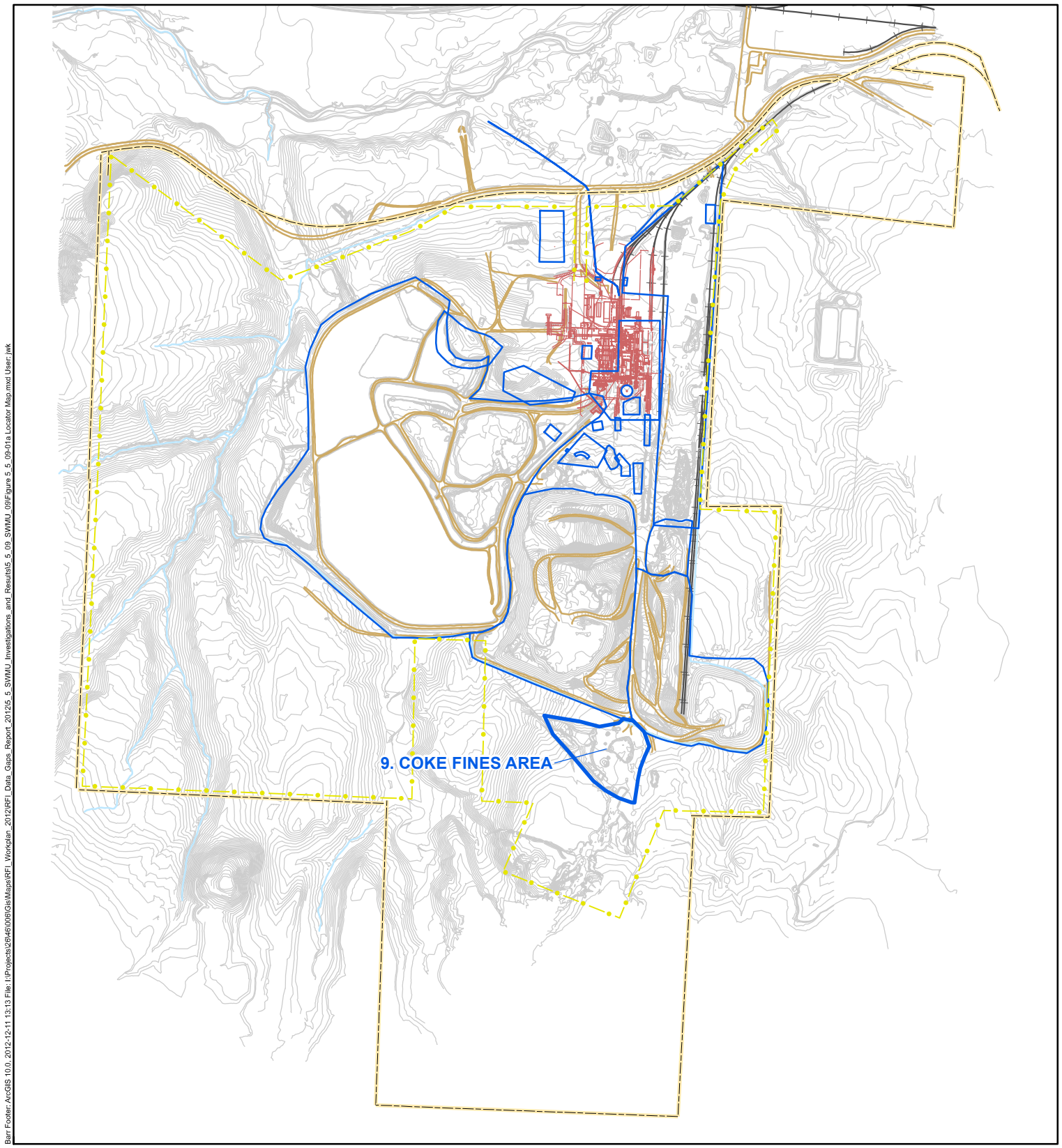
Table 5.5.9-3
Soil Data - Radionuclides
SWMU 9
Rhodia Silver Bow Plant
[concentrations in pCi/g]

			Chemical Name	Lead 210	Radium 226	Thorium 230	Thorium 232	Uranium 234	Uranium 235	Uranium 238
Background Mean, Exceedances **Bold**					**3.6**	**0.960**		**0.730**		**0.780**
Background Maximum, Exceedances Underline					12	3.4		2.8		2.7
Background 95% UPL, Exceedances *Italic*					*5.0*	*1.7*		*1.6*		*1.6*
Location ID	**Sample Date**	**Depth**	**Sample Type**							
CF-30	05/20/2009	0 - 2 in	N	< 5.4	**5.6 +/- 0.91**	**1.3 +/- 0.48**	--	**0.91 +/- 0.4**	0.26 +/- 0.22	**1 +/- 0.34**
CF-31	05/20/2009	0 - 2 in	N	< 6.1	***6.4 +/- 0.99***	**1.7 +/- 0.47**	--	0.58 +/- 0.29	< 0.2	0.73 +/- 0.28
CF-32	05/20/2009	0 - 2 in	N	< 7	3.2 +/- 0.73	**0.82 +/- 0.38**	--	**1.3 +/- 0.37**	< 0.19	0.53 +/- 0.25
CF-33	05/20/2009	0 - 2 in	N	< 5.8	2.7 +/- 0.67	***1.9 +/- 0.61***	--	**1.2 +/- 0.42**	< 0.27	**1 +/- 0.38**
CF-34	05/21/2009	0 - 2 in	N	7.4 +/- 1.4	< 1.8	***21 +/- 1.7***	--	***28 +/- 1.9***	4.9 +/- 0.8	***25.9 +/- 1.8***

Table 5.5.9-4
Phosphate Ore Data - Radionuclides
Near SWMU 9
Rhodia Silver Bow Plant
[concentrations in pCi/g]

			Chemical Name	Lead 210	Radium 226	Thorium 230	Thorium 232	Uranium 234	Uranium 235	Uranium 238
Location ID	Sample Date	Depth	Sample Type							
ORE1	01/01/1999	--	N	--	42 +/- 0.96	--	0.26 +/- 0.92	--	--	0.73 +/- 0.28

Figures



SWMU 9
Other SWMUs
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures
Property Boundary
Fence Line

N

Feet
1,000 0 1,000

Figure 5.5.9-1a

SWMU 9 LOCATION
Rhodia Silver Bow Plant
Montana

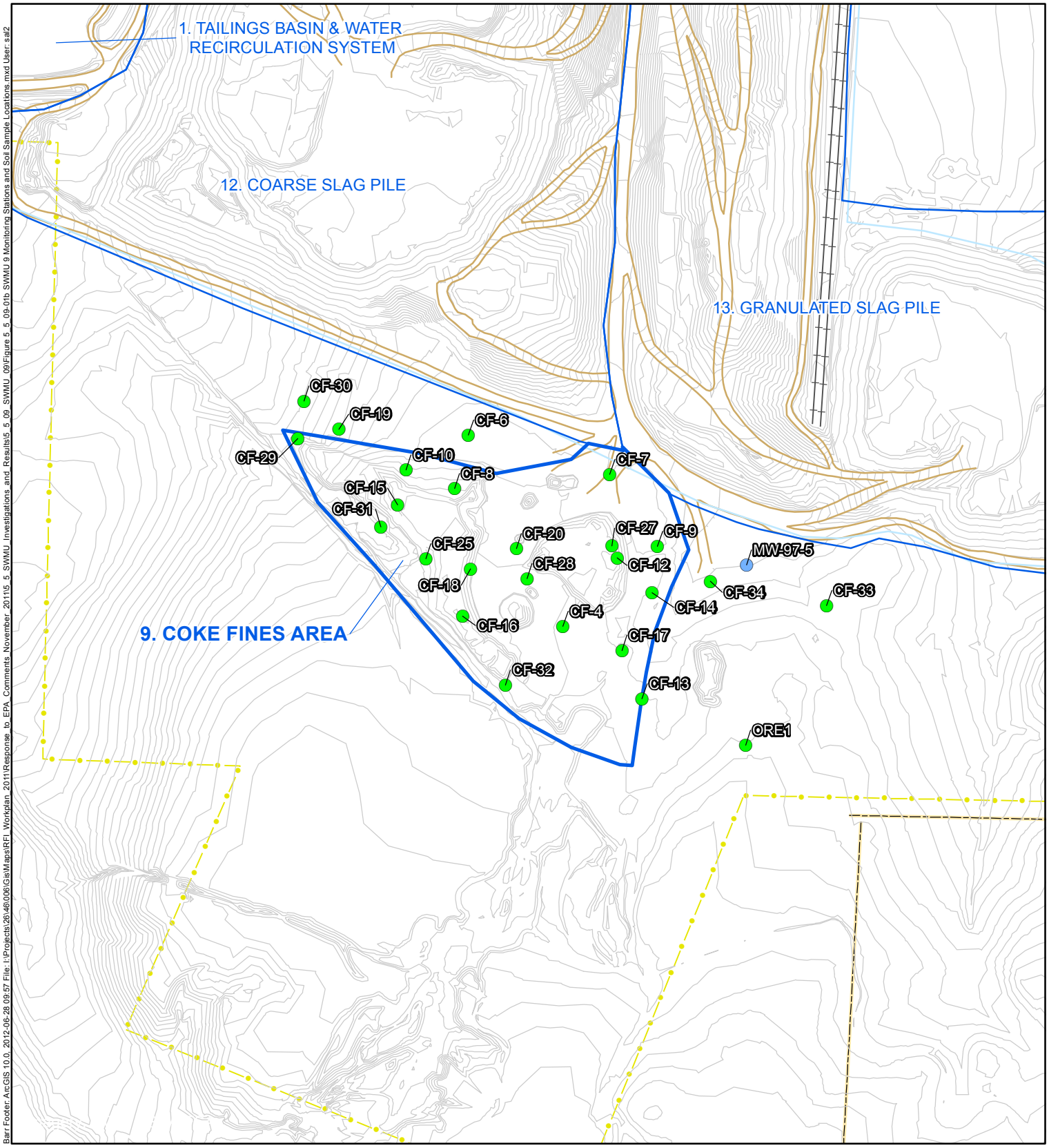


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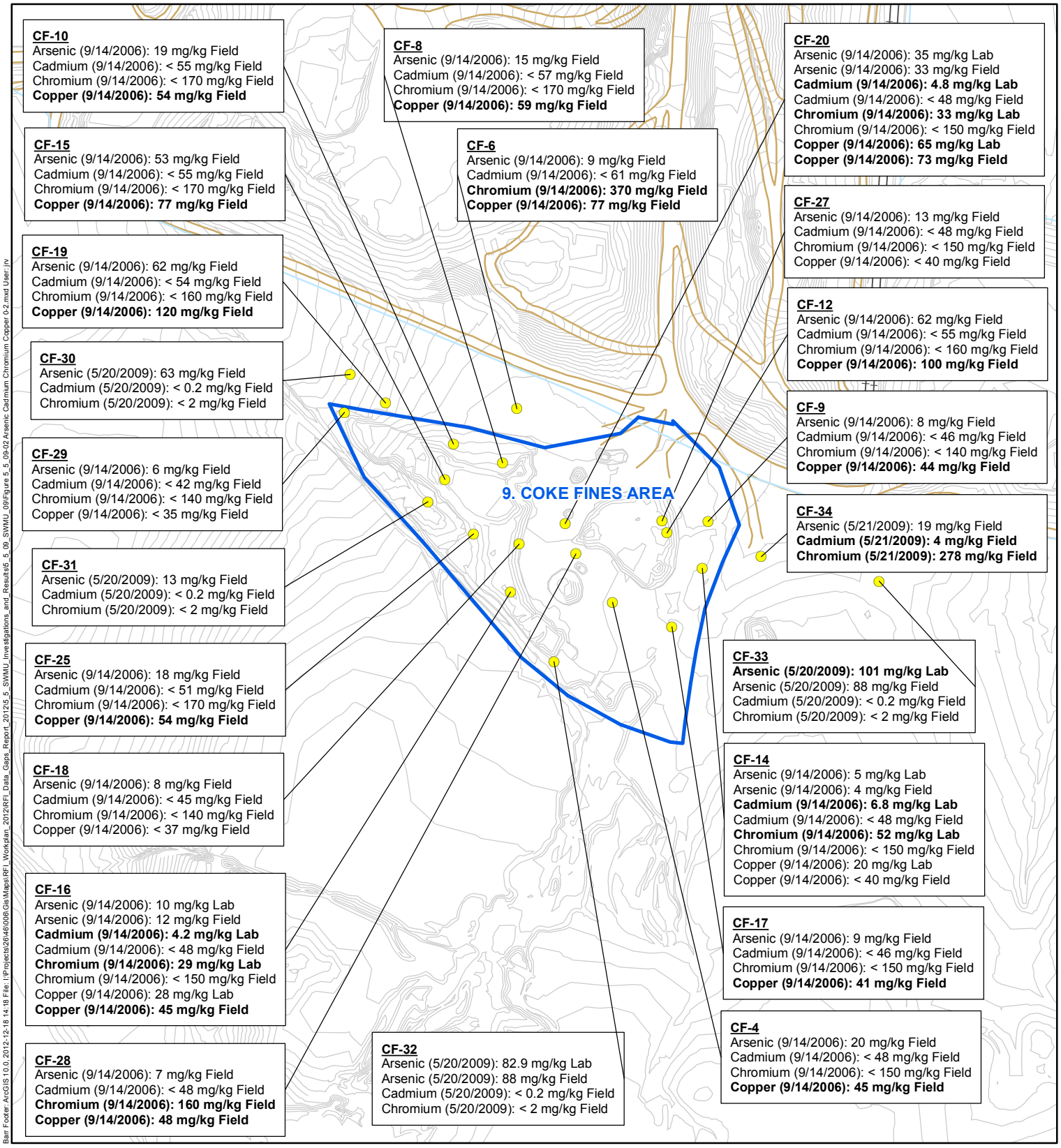
Figure 5.5.9-1b

SWMU 9
MONITORING STATIONS &
SOIL SAMPLE LOCATIONS
Rhodia Silver Bow Plant
Montana



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Sample Location

SWMU 9

Elevation Contour

Drainage

Railroad

Road

Former Plant Structures

Bold font indicates that sample concentration is greater than the 95% UCL of mean Reference Area Concentration.

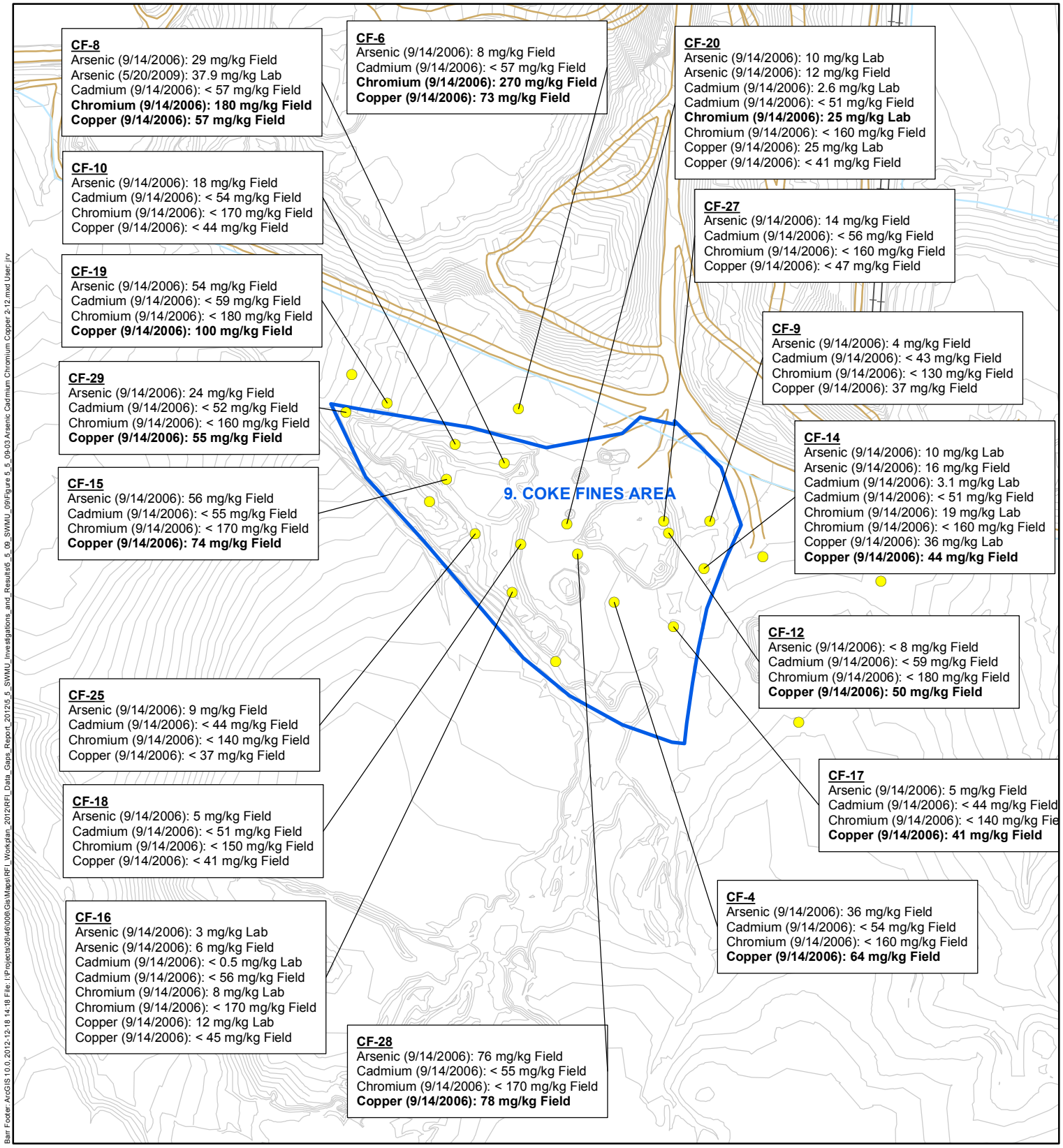
N

Feet

300 0 300

Figure 5.5.9-2

SWMU 9
ARSENIC, CADMIUM, CHROMIUM, AND COPPER, 0-2 INCHES
Rhodia Silver Bow Plant
Montana



Sample Location

SWMU 9

Elevation Contour

Drainage

Railroad

Road

Former Plant Structures

Bold font indicates that sample concentration is greater than the 95% UCL of mean Reference Area Concentration.

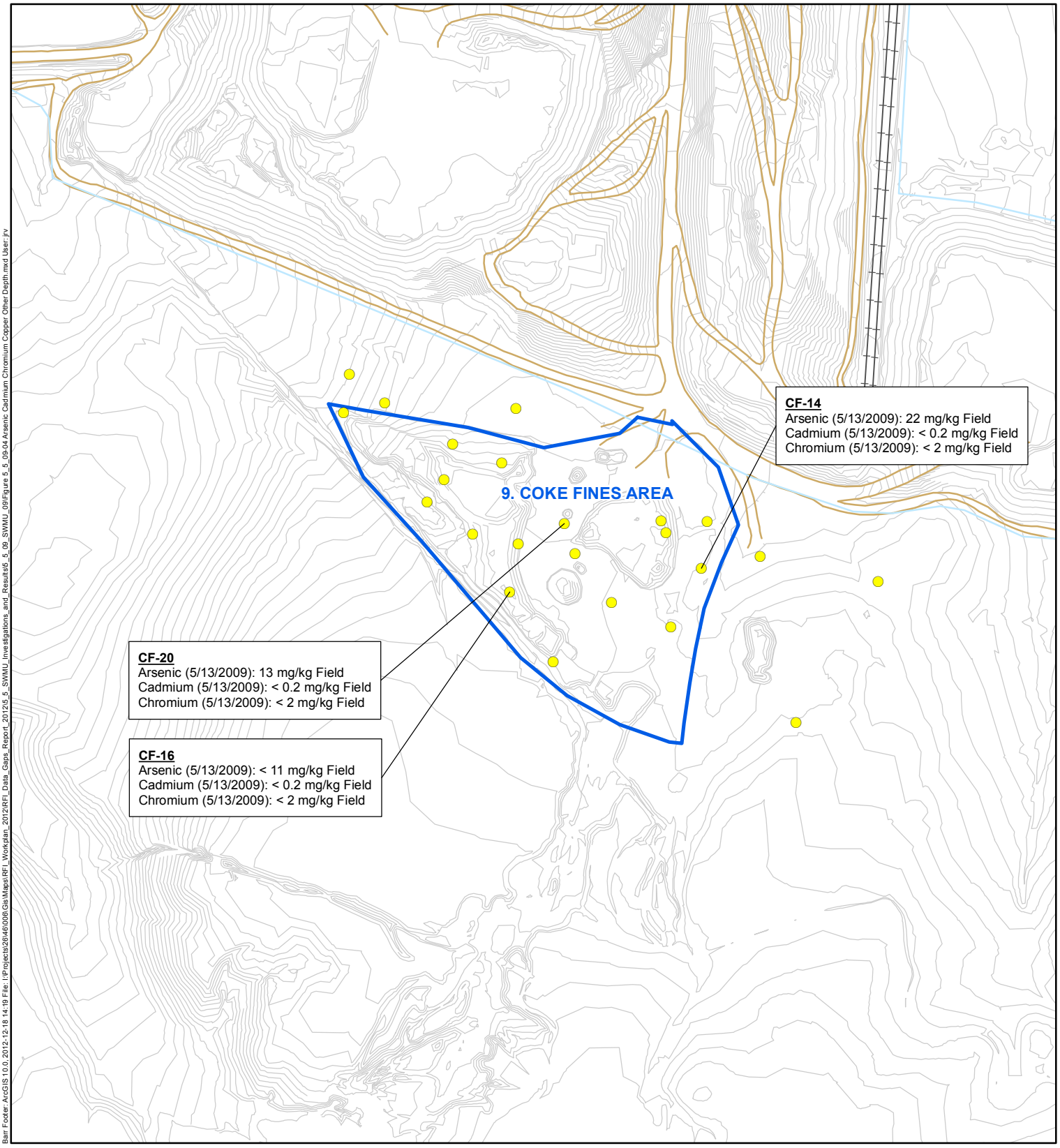
N

Feet

300 0 300

Figure 5.5.9-3

SWMU 9
ARSENIC, CADMIUM, CHROMIUM, AND COPPER, 2-12 INCHES
Rhodia Silver Bow Plant
Montana



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Sample Location

SWMU 9

Elevation Contour

Drainage

Railroad

Road

Former Plant Structures

Bold font indicates that sample concentration is greater than the 95% UCL of mean Reference Area Concentration.

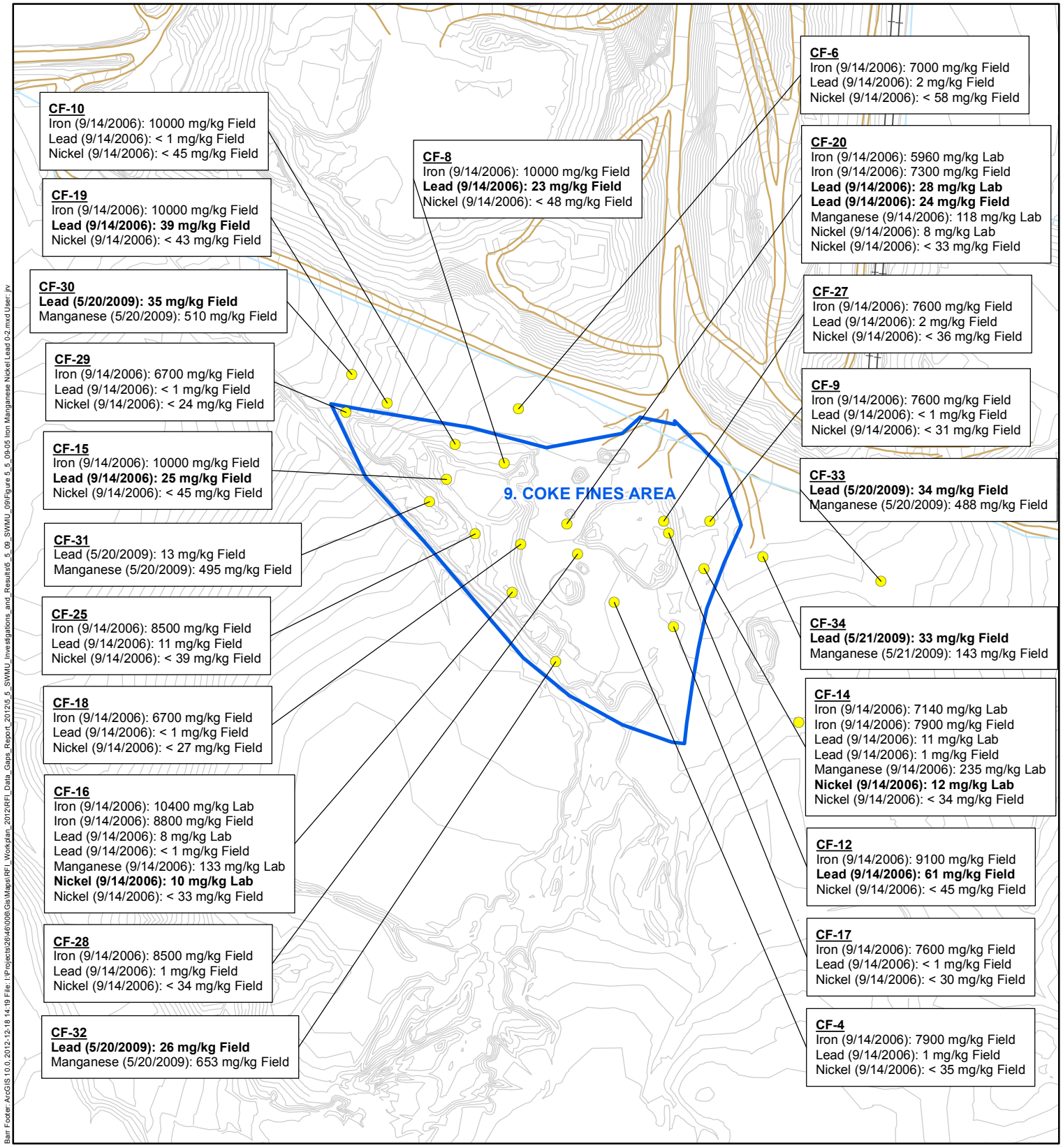
N

Feet

300 0 300

Figure 5.5.9-4

SWMU 9
ARSENIC, CADMIUM, CHROMIUM, AND COPPER, OTHER DEPTHS
Rhodia Silver Bow Plant
Montana



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Sample Location

SWMU 9

Elevation Contour

Drainage

Railroad

Road

Former Plant Structures

Bold font indicates that sample concentration is greater than the 95% UCL of mean Reference Area Concentration.

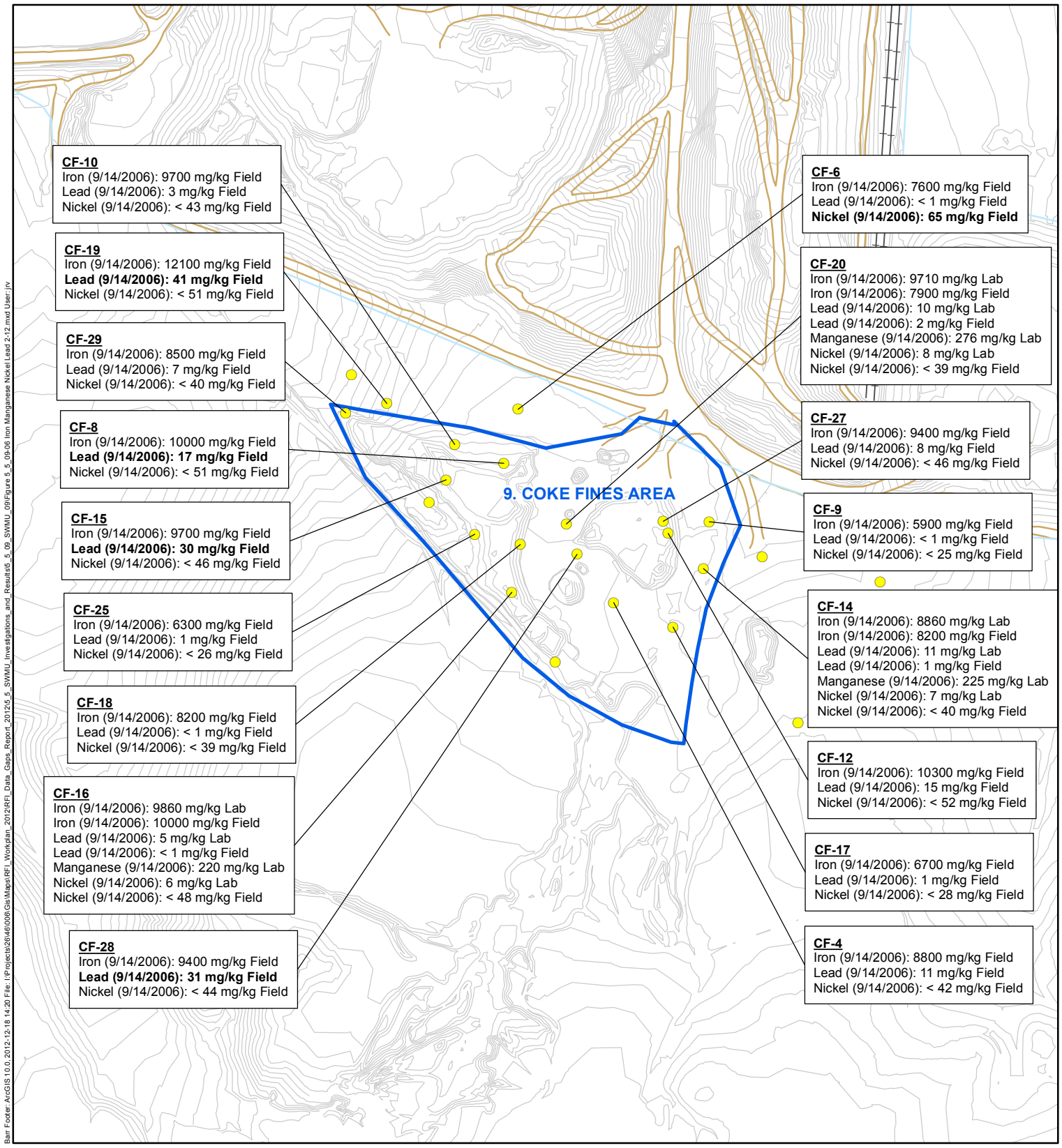
N

Feet

300 0 300

Figure 5.5.9-5

SWMU 9
IRON, MANGANESE, NICKEL, AND LEAD, 0-2 INCHES
Rhodia Silver Bow Plant
Montana



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Sample Location

SWMU 9

Elevation Contour

Drainage

Railroad

Road

Former Plant Structures

Bold font indicates that sample concentration is greater than the 95% UCL of mean Reference Area Concentration.

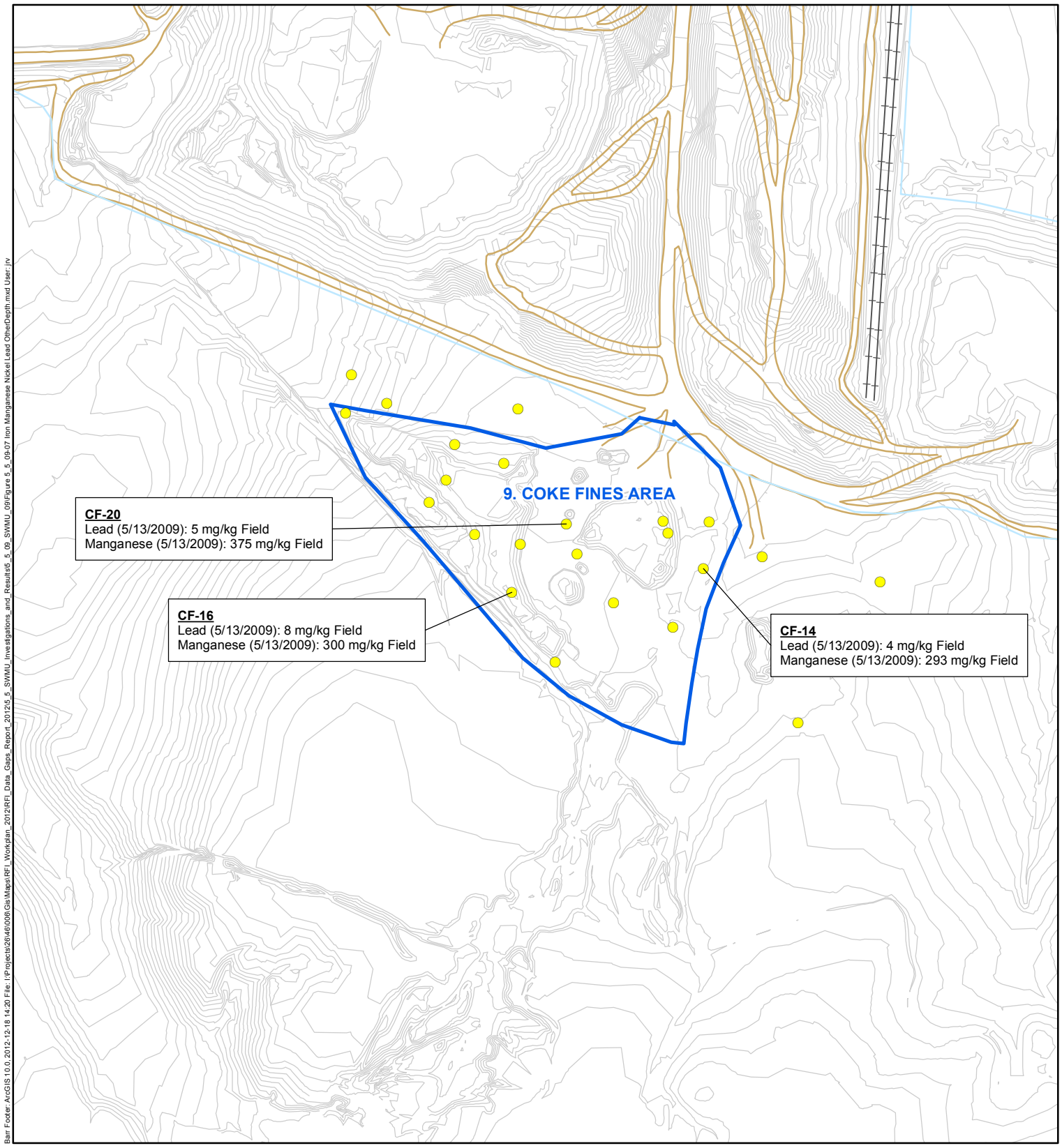
N

Feet

300 0 300

Figure 5.5.9-6

SWMU 9
IRON, MANGANESE, NICKEL, AND LEAD, 2-12 INCHES
Rhodia Silver Bow Plant
Montana



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- Sample Location
- SWMU 9
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

Bold font indicates that sample concentration is greater than the 95% UCL of mean Reference Area Concentration.

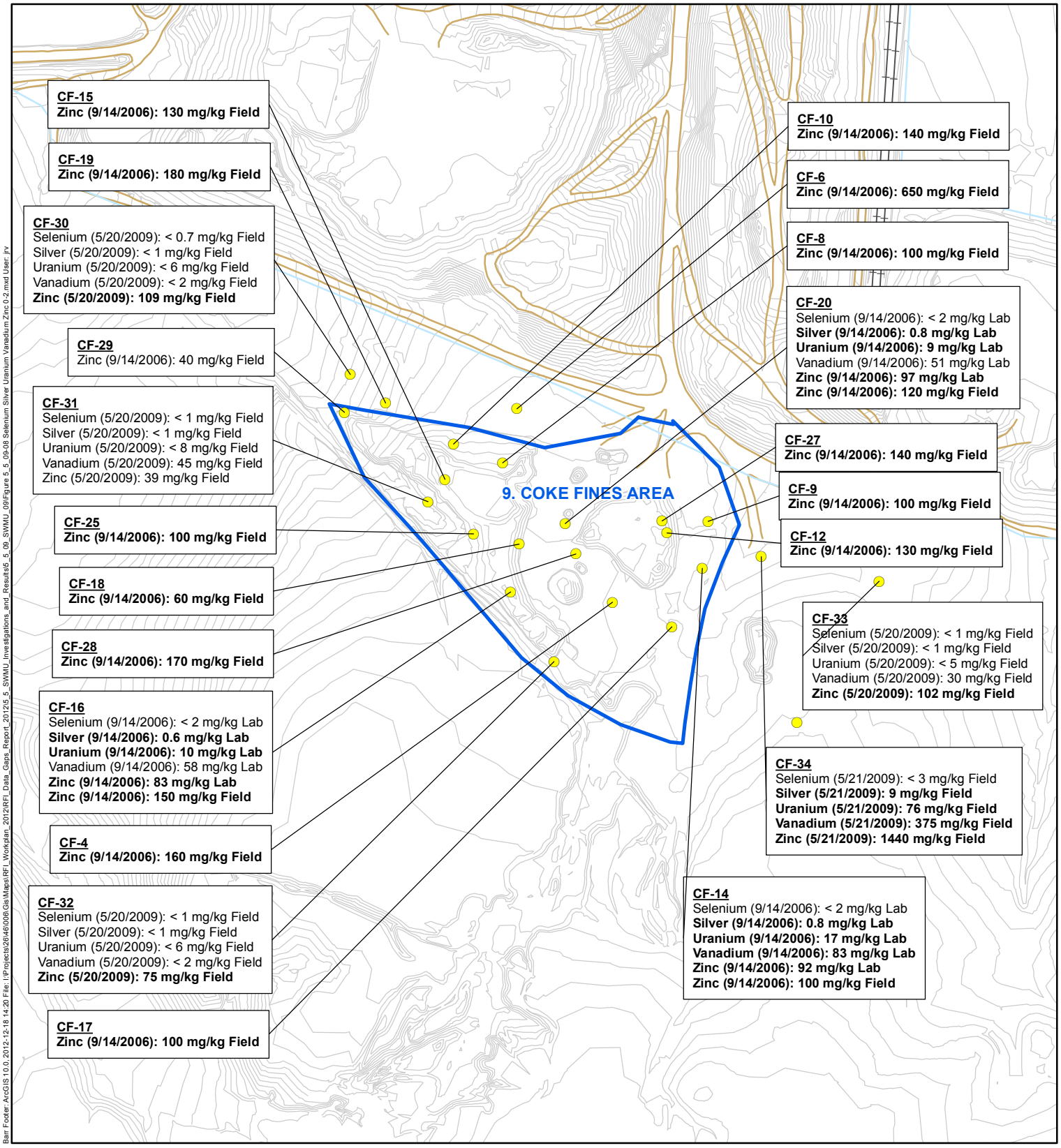
N

Feet

300 0 300

Figure 5.5.9-7

SWMU 9
IRON, MANGANESE, NICKEL, AND LEAD, OTHER DEPTHS
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-18 14:20 File: I:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_09_SWMU_09\Figure 5_5_09-08 Selenium Silver Uranium Vanadium Zinc 0-2.mxd User: jrv

Sample Location
SWMU 9
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures

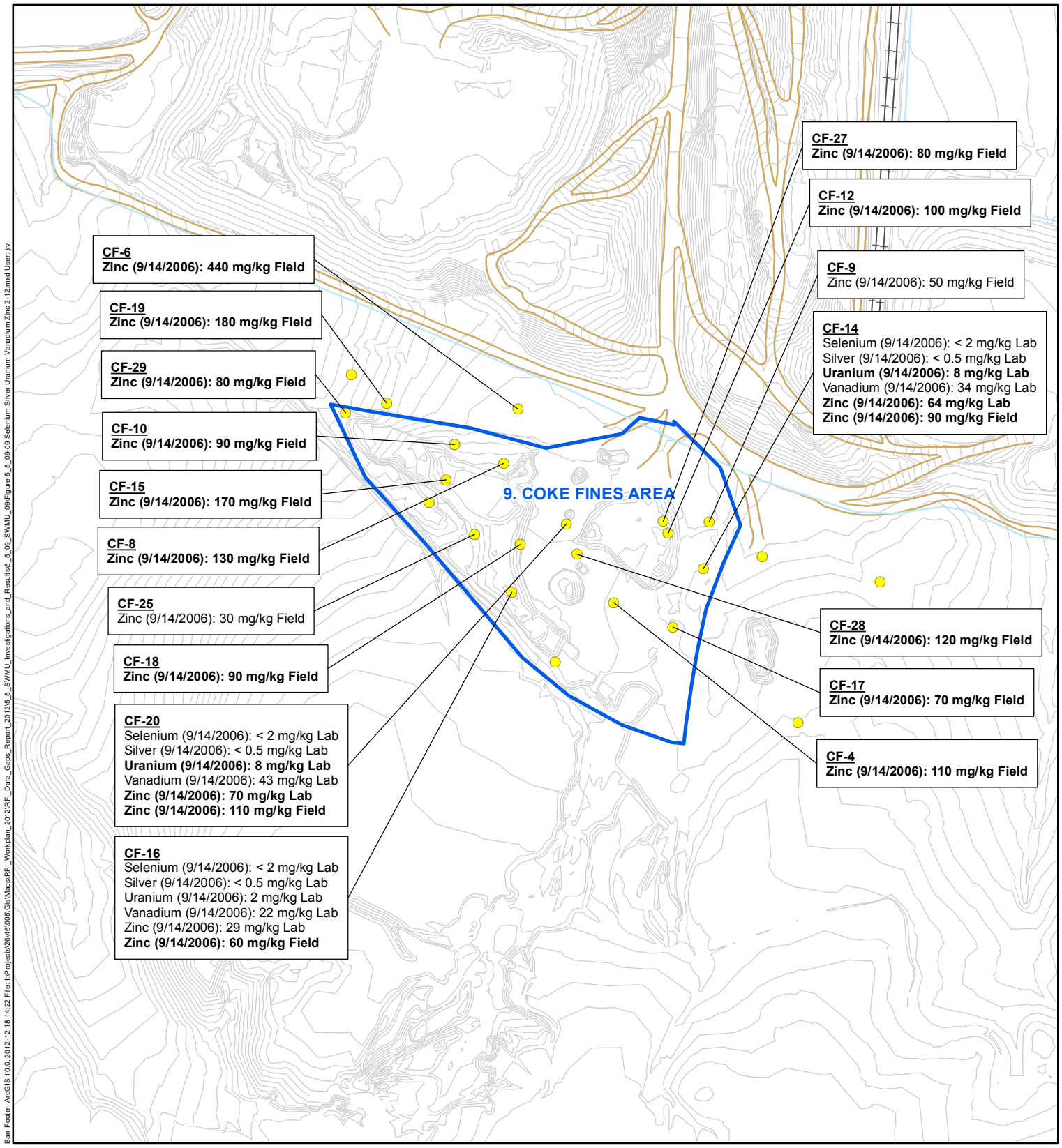
Bold font indicates that sample concentration is greater than the 95% UCL of mean Reference Area Concentration.

N

Feet
300 0 300

Figure 5.5.9-8

SWMU 9
SELENIUM, SILVER, URANIUM, VANADIUM, AND ZINC, 0-2 INCHES
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-18 14:22 File: I:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_09_SWMU_09\Figure 5_5_09-09 Selenium Silver Uranium Vanadium Zinc 2-12.mxd User: jhr

Sample Location

SWMU 9

Elevation Contour

Drainage

Railroad

Road

Former Plant Structures

Bold font indicates that sample concentration is greater than the 95% UCL of mean Reference Area Concentration.

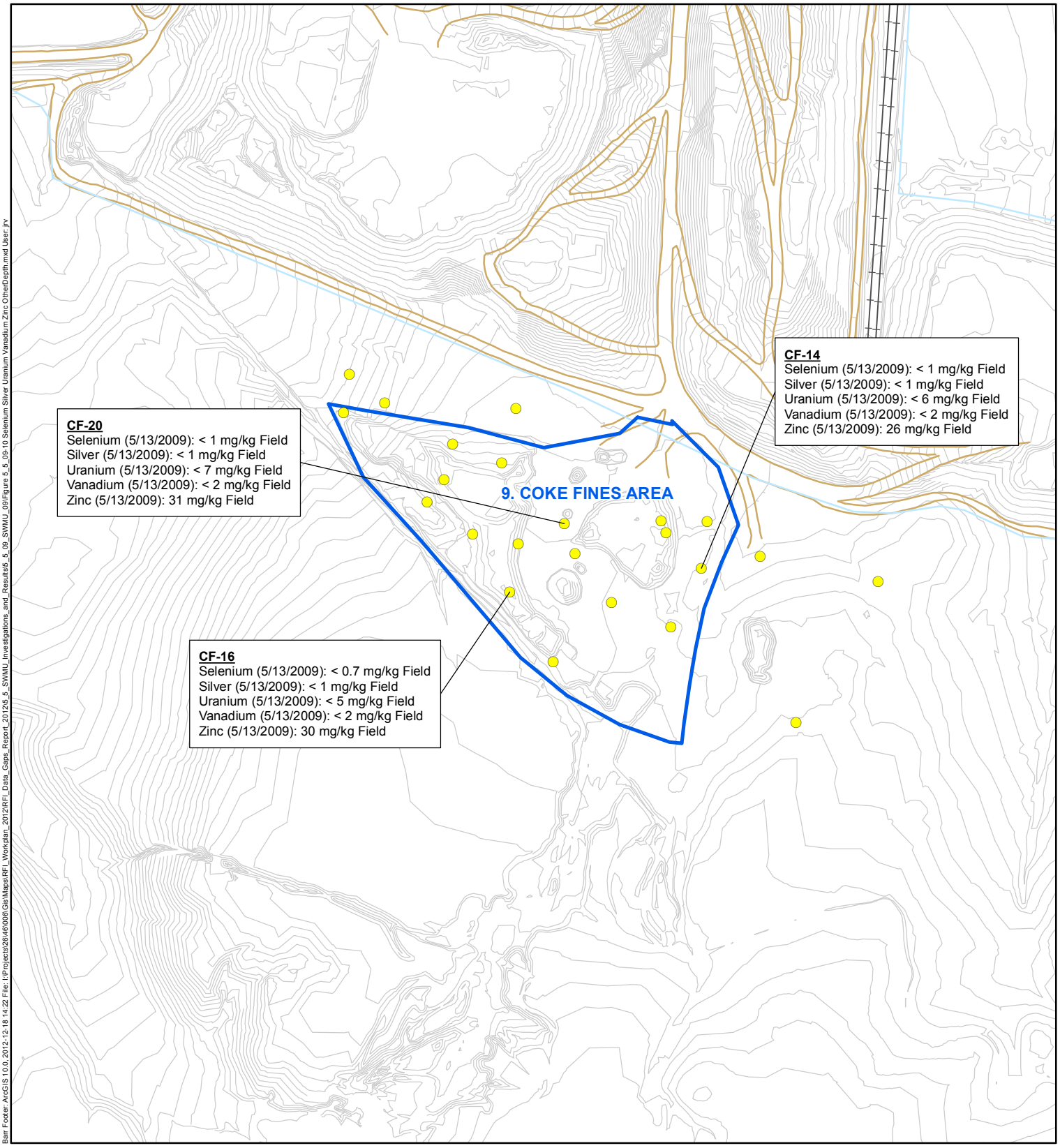
N

Feet

300 0 300

Figure 5.5.9-9

SWMU 9
SELENIUM, SILVER, URANIUM.
VANADIUM, AND ZINC, 2-12 INCHES
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-18 14:22 File: I:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_09_SWMU_09\Figure 5_5_09-10 Selenium Silver Uranium Vanadium Zinc OtherDepth.mxd User: jrv

Sample Location
SWMU 9
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures

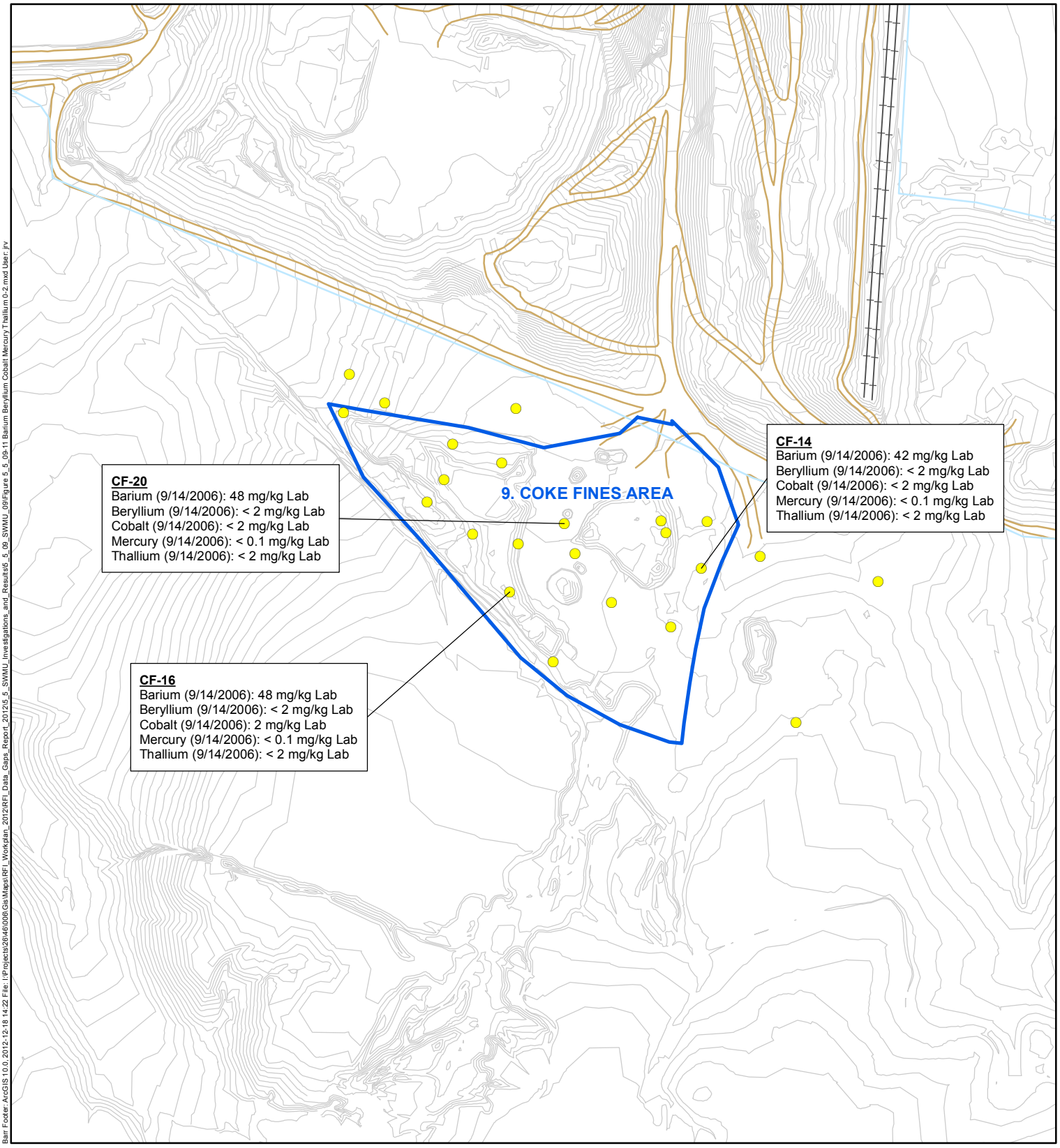
Bold font indicates that sample concentration is greater than the 95% UCL of mean Reference Area Concentration.

N

Feet
300 0 300

Figure 5.5.9-10

SWMU 9
SELENIUM, SILVER, URANIUM, VANADIUM, AND ZINC, OTHER DEPTHS
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-18 14:22 File: I:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_09_SWMU_09\Figure 5_5_09-11 Barium Beryllium Cobalt Mercury Thallium 0-2.mxd User: jrv

Sample Location
SWMU 9
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures

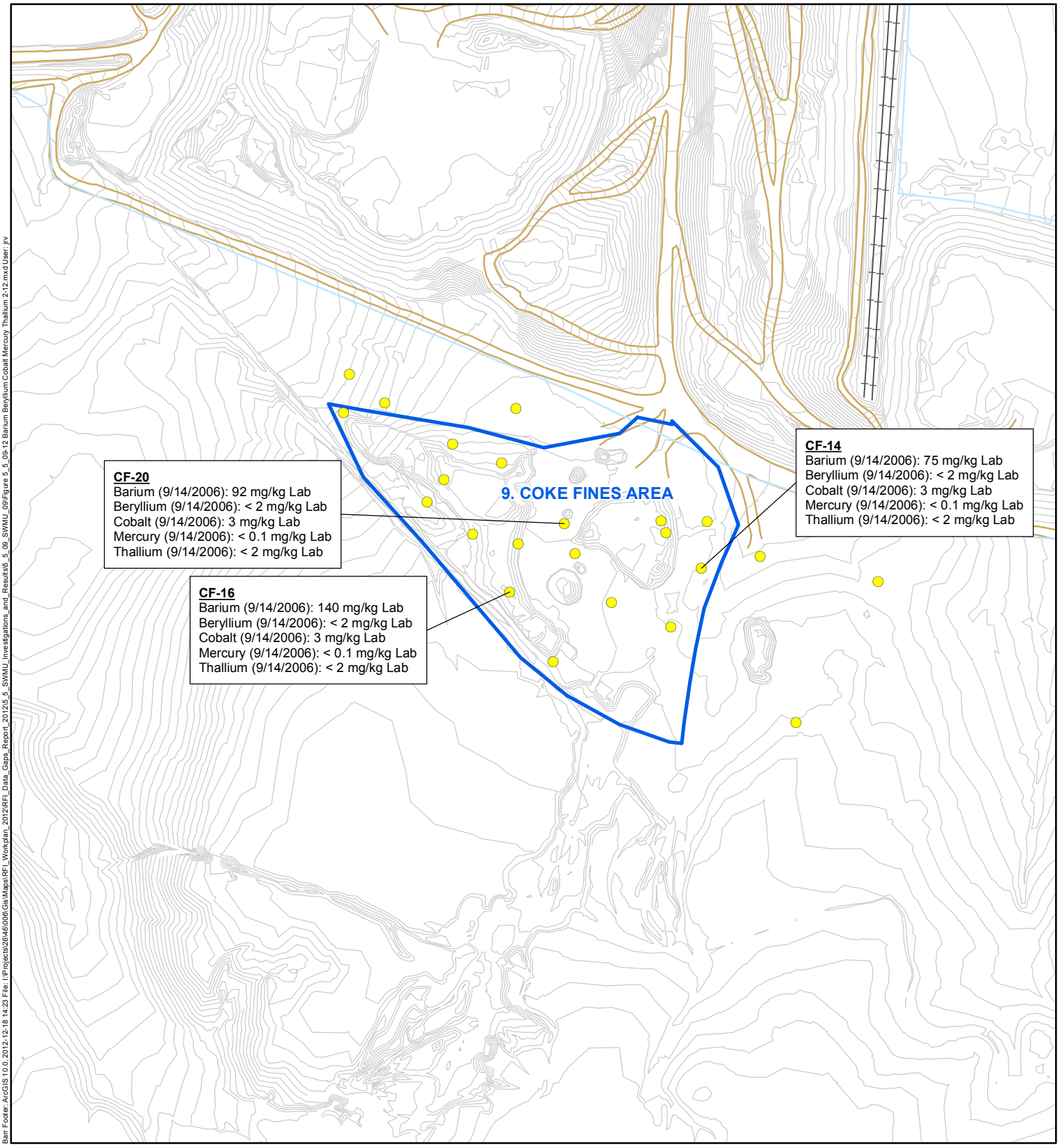
Bold font indicates that sample concentration is greater than the 95% UCL of mean Reference Area Concentration.

N

Feet
300 0 300

Figure 5.5.9-11

SWMU 9
BARIUM, BERYLLIUM, COBALT, MERCURY, AND THALLIUM, 0-2 INCHES
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-18 14:23 File: I:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_20125\5_SWMU_Investigations_and_Results\5_5_09_SWMU_09\Figure 5_5_09-12 Barium Beryllium Cobalt Mercury Thallium 2-12.mxd User: jrv

Sample Location
SWMU 9
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures

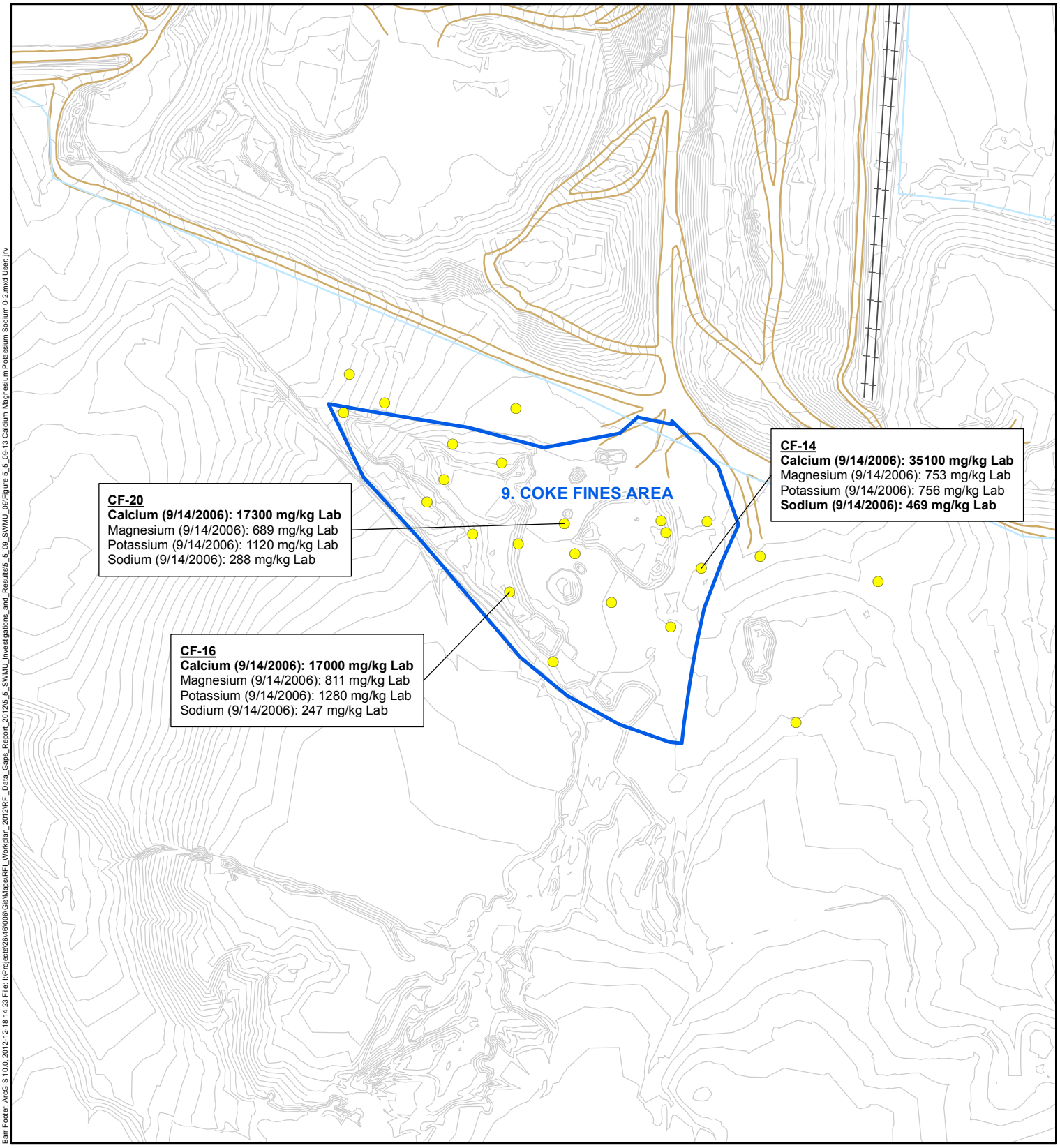
Bold font indicates that sample concentration is greater than the 95% UCL of mean Reference Area Concentration.

N

Feet
300 0 300

Figure 5.5.9-12

SWMU 9
BARIUM, BERYLLIUM, COBALT, MERCURY, THALLIUM, 2-12 INCHES
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-18 14:23 File: I:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_09_SWMU_09\Figure 5_5_09-13 Calcium Magnesium Potassium Sodium 0-2.mxd User: jrv

- Sample Location
- SWMU 9
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

Bold font indicates that sample concentration is greater than the 95% UCL of mean Reference Area Concentration.

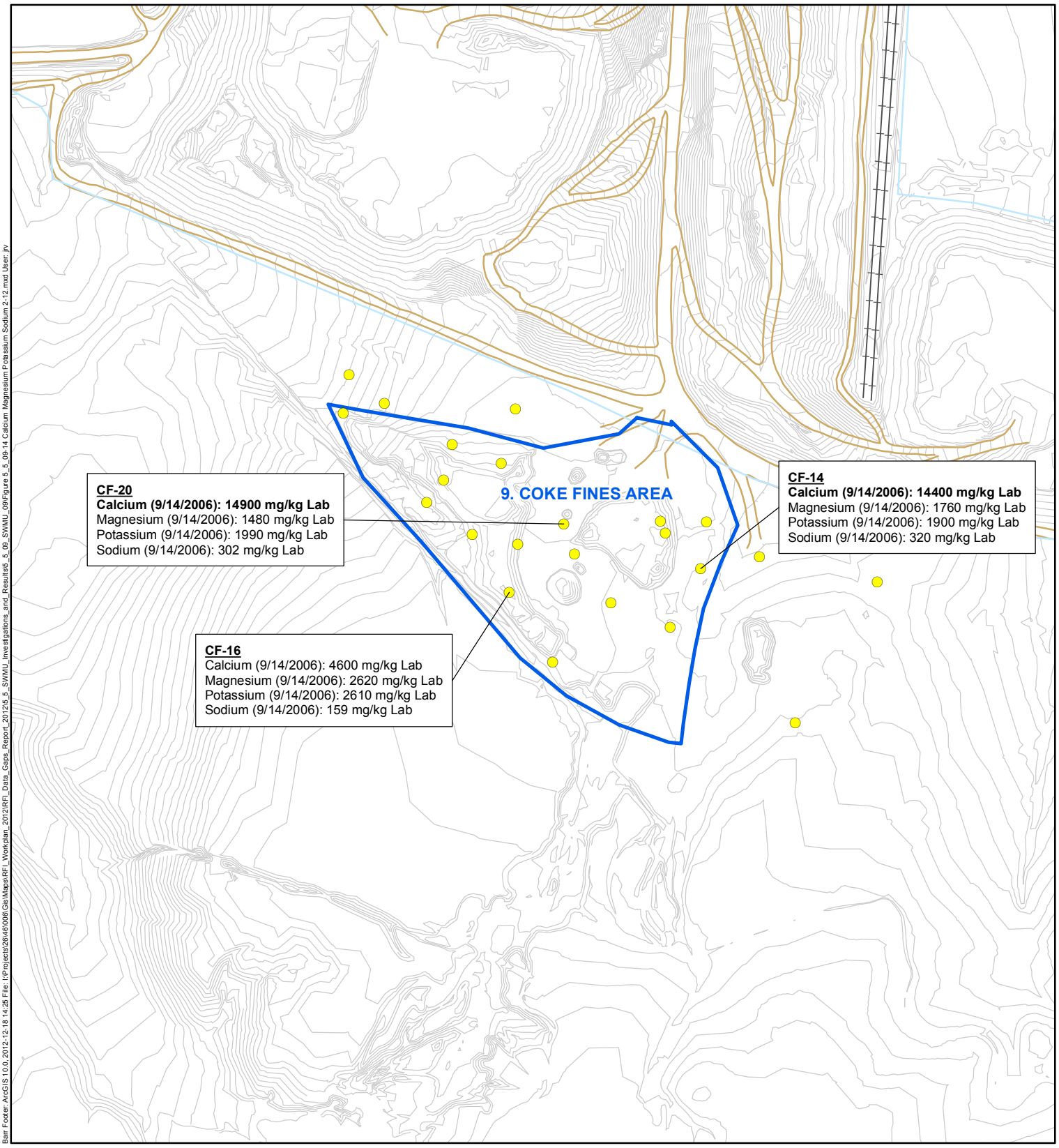
N

Feet

300 0 300

Figure 5.5.9-13

SWMU 9
CALCIUM, MAGNESIUM, POTASSIUM, AND SODIUM, 0-2 INCHES
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-18 14:25 File: I:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_09_SWMU_09\Figure 5_5_09-14 Calcium Magnesium Potassium Sodium 2-12.mxd User: jrv

- Sample Location
- SWMU 9
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

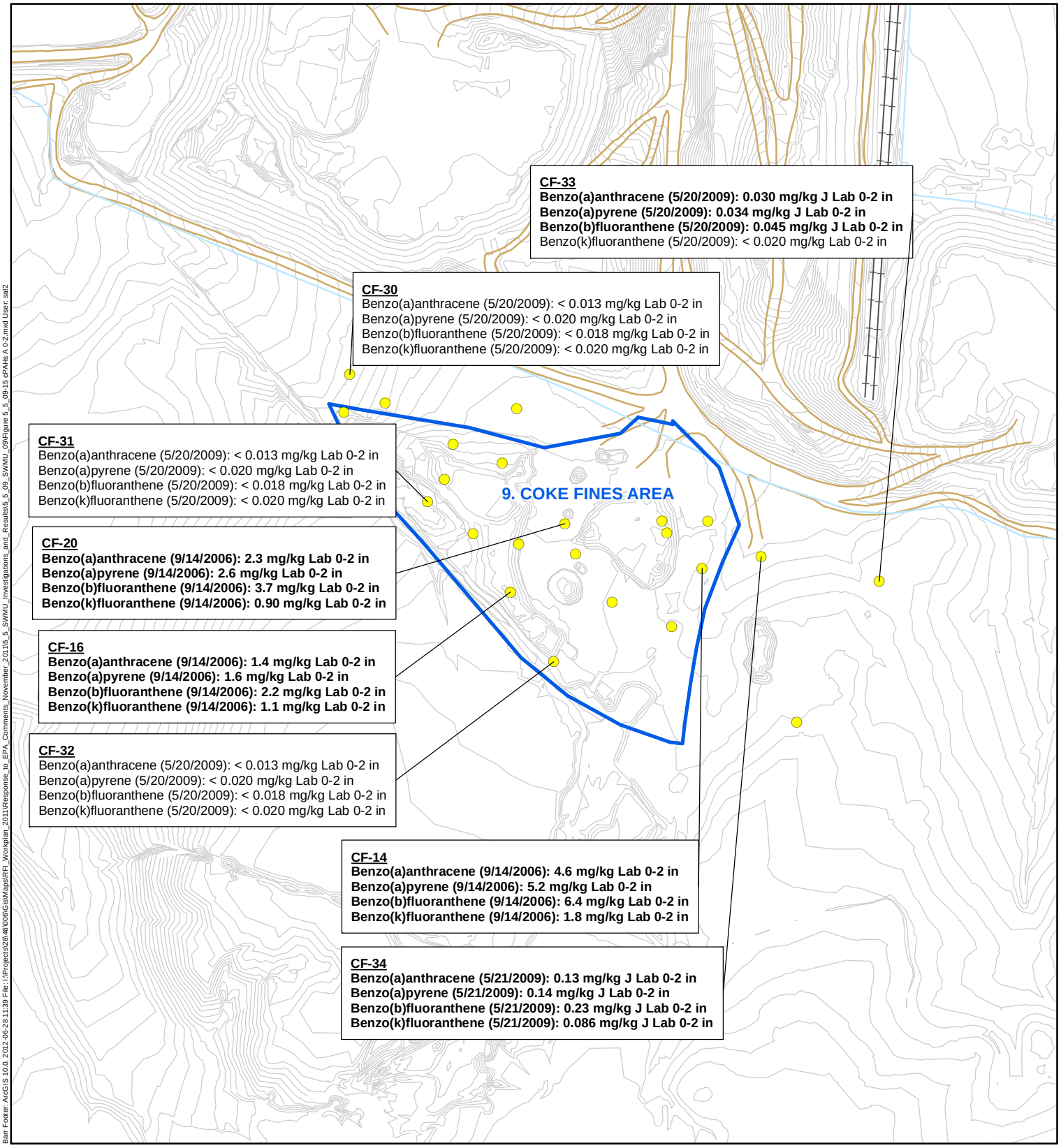
Feet

300 0 300

Bold font indicates that sample concentration is greater than the 95% UCL of mean Reference Area Concentration.

Figure 5.5.9-14

SWMU 9
CALCIUM, MAGNESIUM, POTASSIUM, AND SODIUM, 2-12 INCHES
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-06-28 11:39 File: I:\Projects\26\4606\GIS\Maps\RFI_Workplan_2011\Response_to_EPA_Comments_November_20135_5_SWMU_Investigations_and_Results\5_5_09_SWMU_09\Figure 5_5_09-15 cPAHs A 0-2.mxd User: sal2

Sample Location

SWMU 9

Elevation Contour

Drainage

Railroad

Road

Former Plant Structures

Bold font indicates that the parameter was detected.

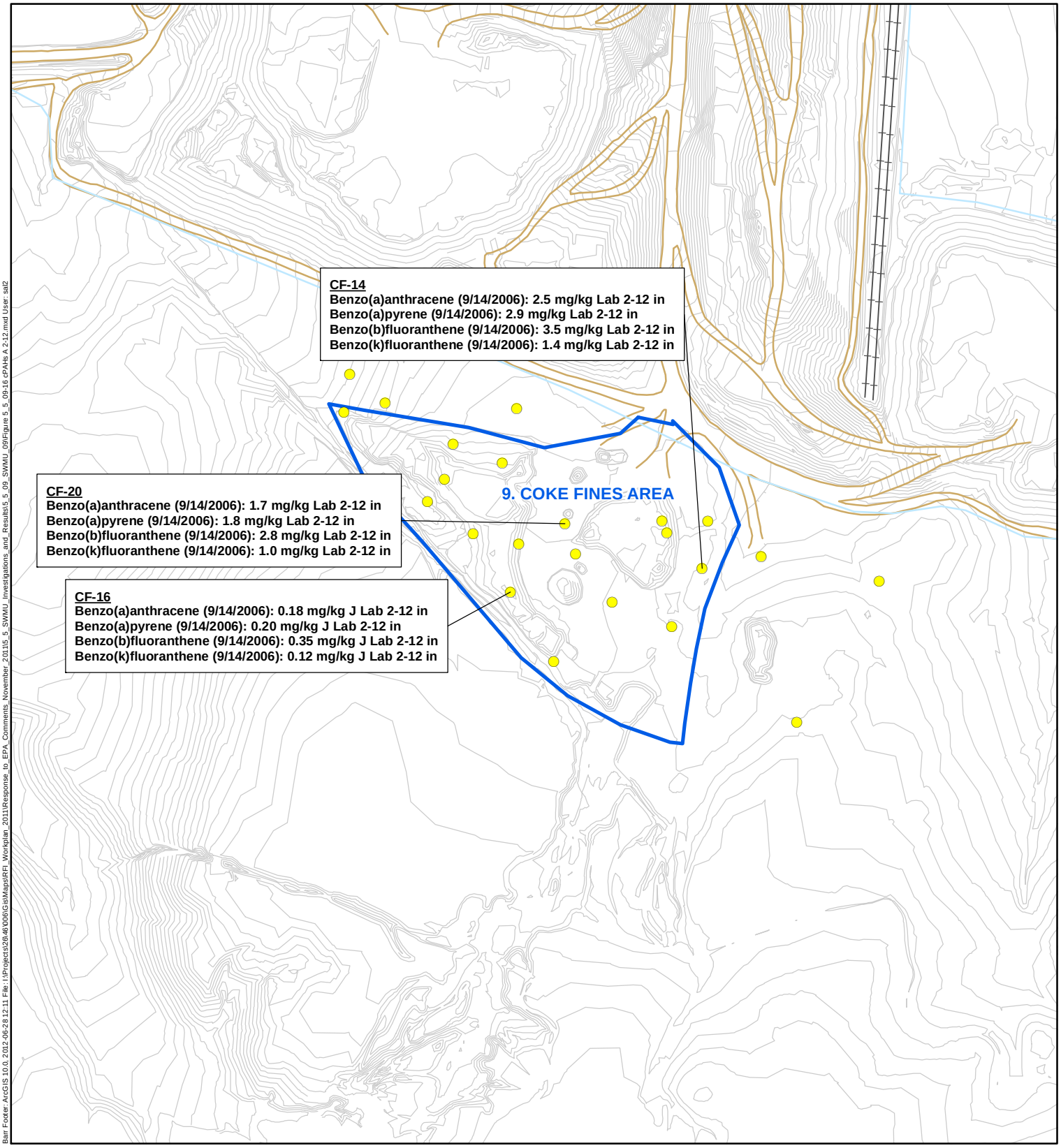
N

Feet

300 0 300

Figure 5.5.9-15

SWMU 9
cPAHs GROUP A, 0-2 INCHES
Rhodia Silver Bow Plant
Montana



Sample Location
SWMU 9
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures

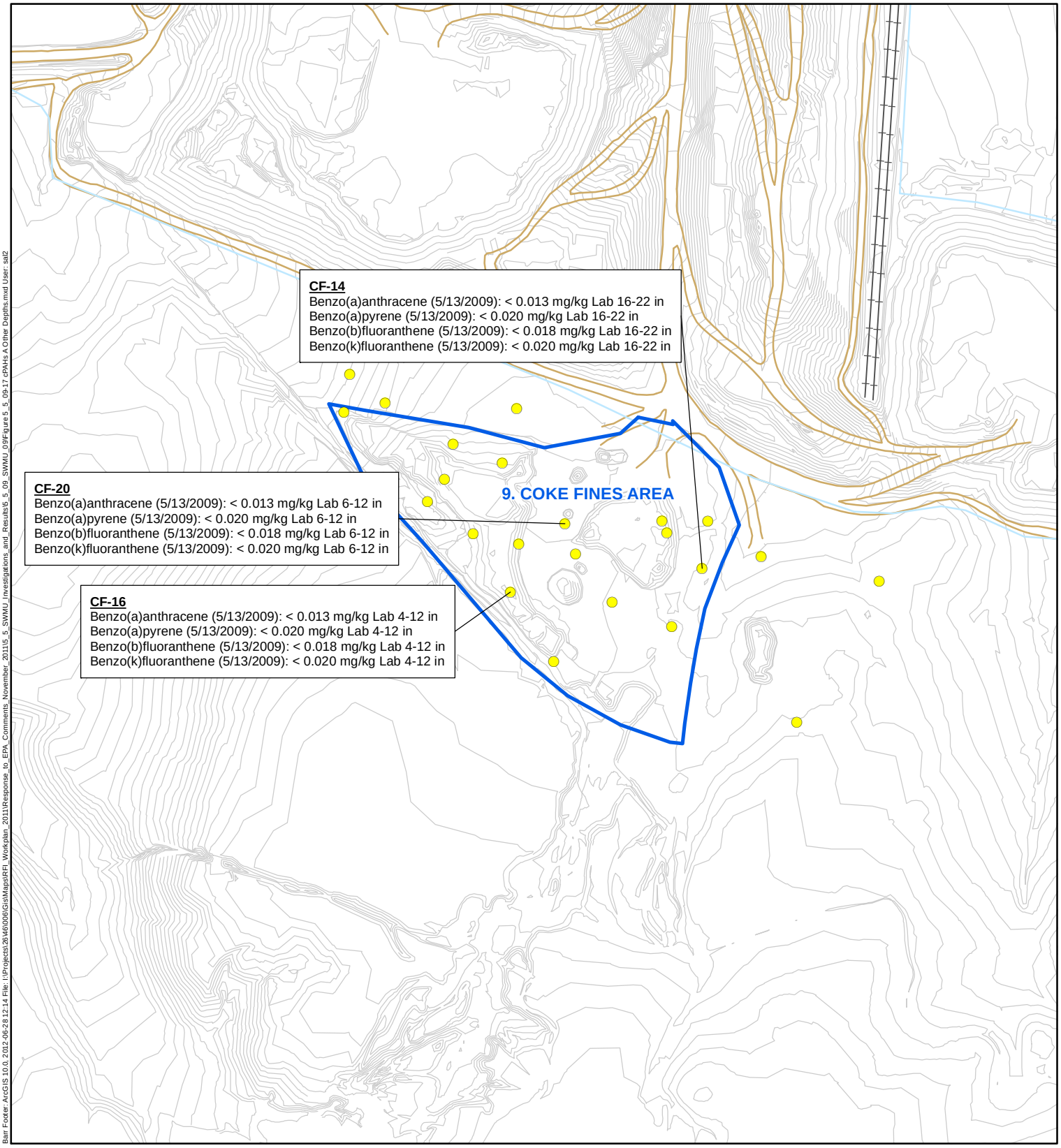
Bold font indicates that the parameter was detected.

N

Feet
300 0 300

Figure 5.5.9-16

SWMU 9
cPAHs GROUP A, 2-12 INCHES
Rhodia Silver Bow Plant
Montana



Sample Location
SWMU 9
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures

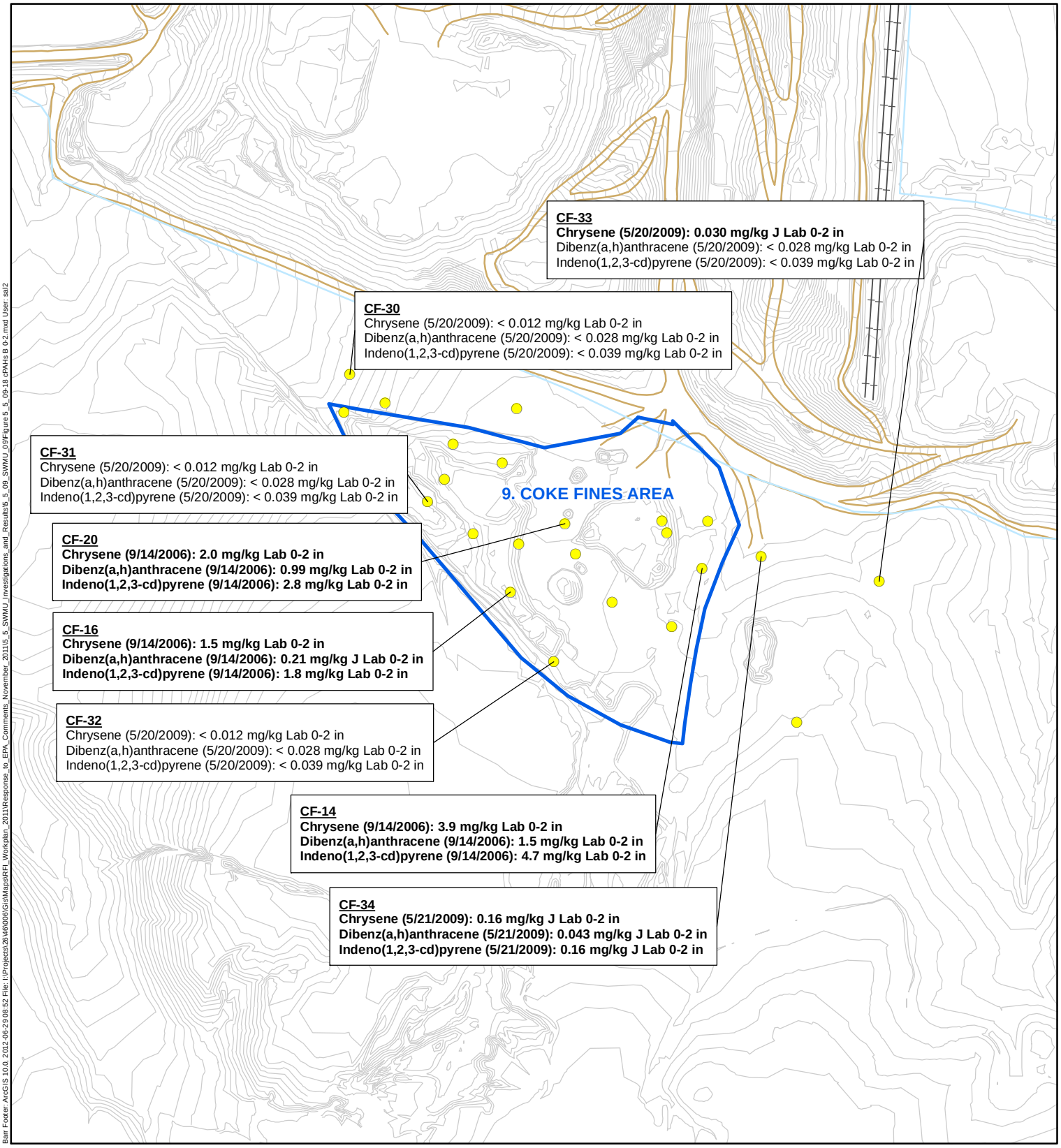
Bold font indicates that the parameter was detected.

N

Feet
300 0 300

Figure 5.5.9-17

SWMU 9
cPAHs GROUP A,
OTHER DEPTHS
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-06-29 08:52 File: I:\Projects\2614\0006\GisMaps\RFI_Workplan_2011\Response_to_EPA_Comments_November_201115_5_SWMU_Investigations_and_Results\5_5_09_SWMU_09\Figure 5_5_09-18 cPAHs B 0-2.mxd User: sal2

Sample Location

SWMU 9

Elevation Contour

Drainage

Railroad

Road

Former Plant Structures

Bold font indicates that the parameter was detected.

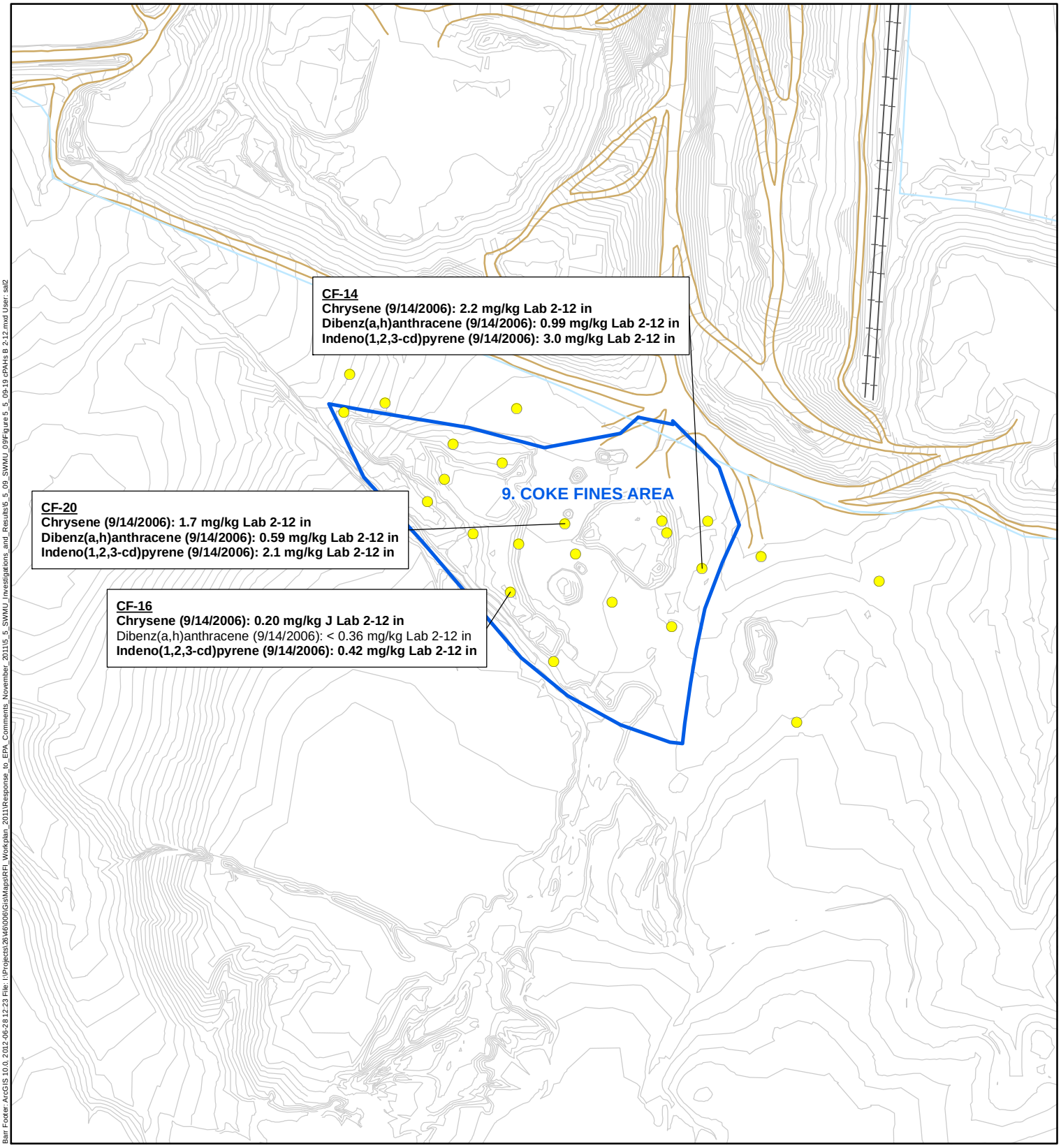
N

Feet

300 0 300

Figure 5.5.9-18

SWMU 9
cPAHs GROUP B, 0-2 INCHES
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-06-28 12:23 File: I:\Projects\2614\0006\Gis\Maps\RFI_Workplan_2011\Response_to_EPA_Comments_November_201115_5_SWMU_Investigations_and_Results\5_5_09_SWMU_09\Figure 5_5_09-19 cPAHs B 2-12.mxd User: sal2

Sample Location

SWMU 9

Elevation Contour

Drainage

Railroad

Road

Former Plant Structures

Bold font indicates that the parameter was detected.

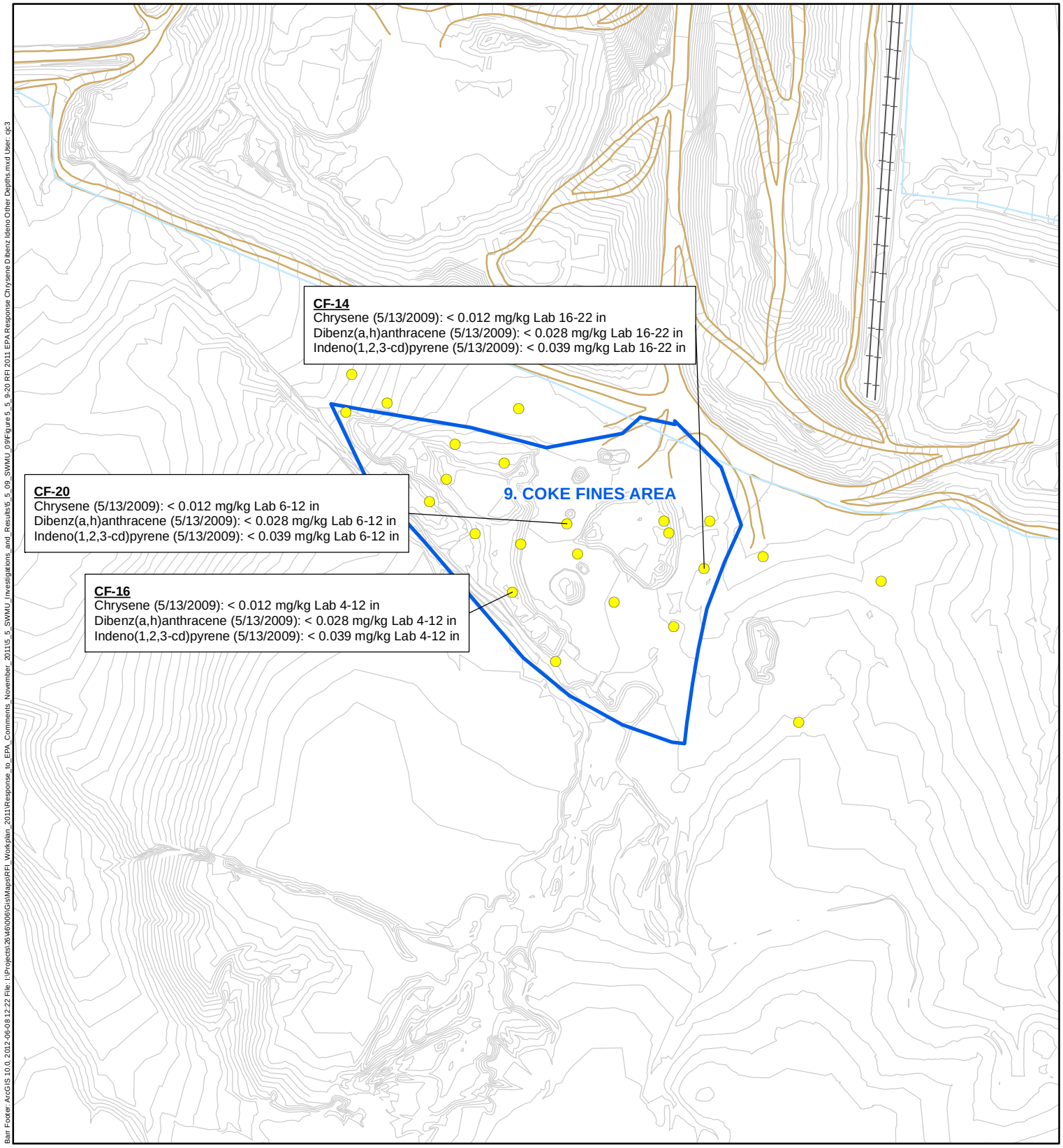
N

Feet

300 0 300

Figure 5.5.9-19

SWMU 9
cPAHs GROUP B, 2-12 INCHES
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-06-08 12:22 File: I:\Projects\26\46\006\GIs\Maps\RFI_Workplan_2011\Response_to_EPA_Comments_November_201115_5_SWMU_Investigations_and_Results\5_5_09_SWMU_09\Figure 5_5_9-20 RFI 2011 EPA Response Chrysene Dibenz Ideno Other Depths.mxd User: cjc3

Sample Location
SWMU 9
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures

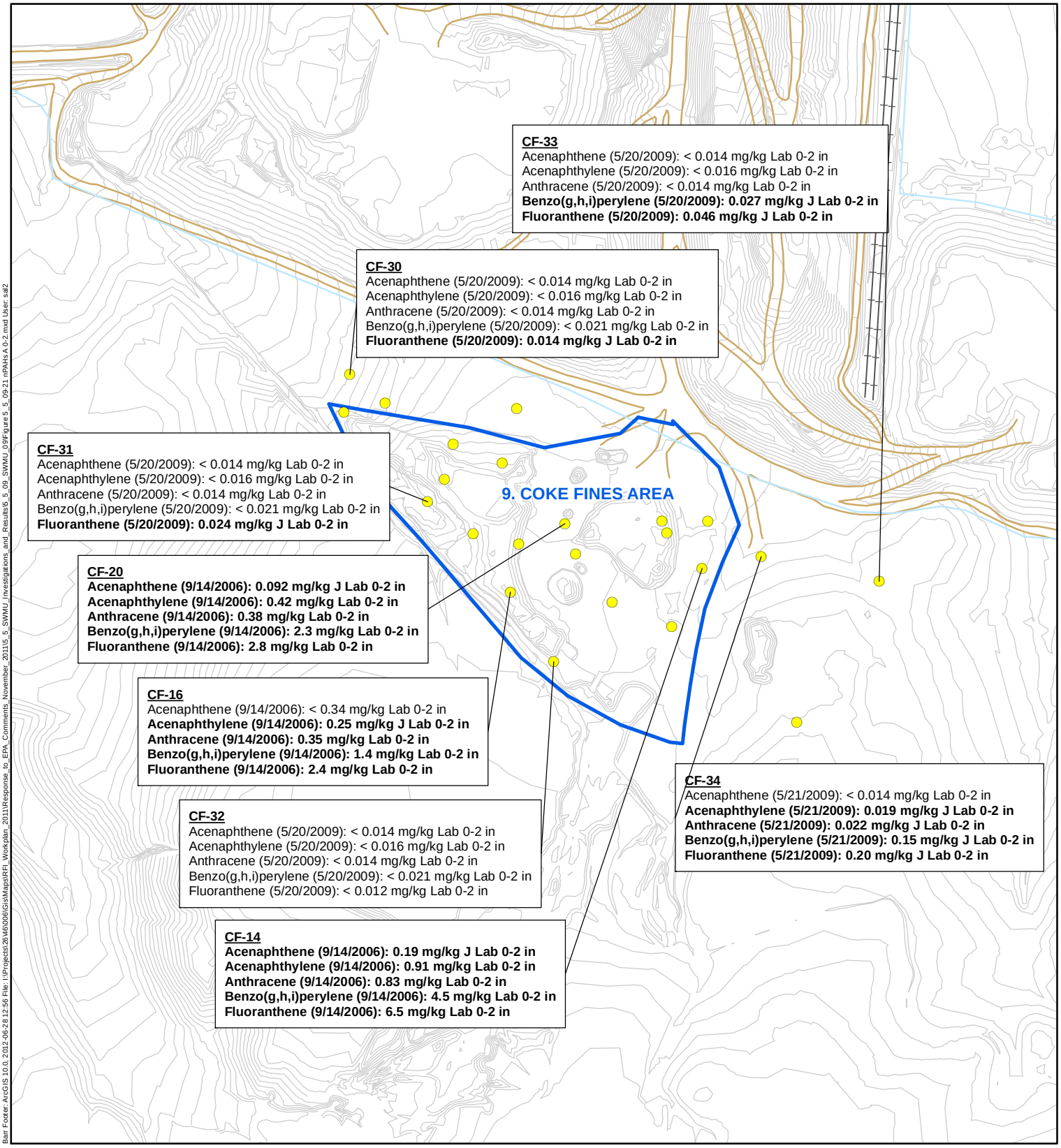
Bold font indicates that the parameter was detected.

N

Feet
300 0 300

Figure 5.5.9-20

SWMU 9
cPAHs GROUP B,
OTHER DEPTHS
Rhodia Silver Bow Plant
Montana



Sample Location
SWMU 9
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures

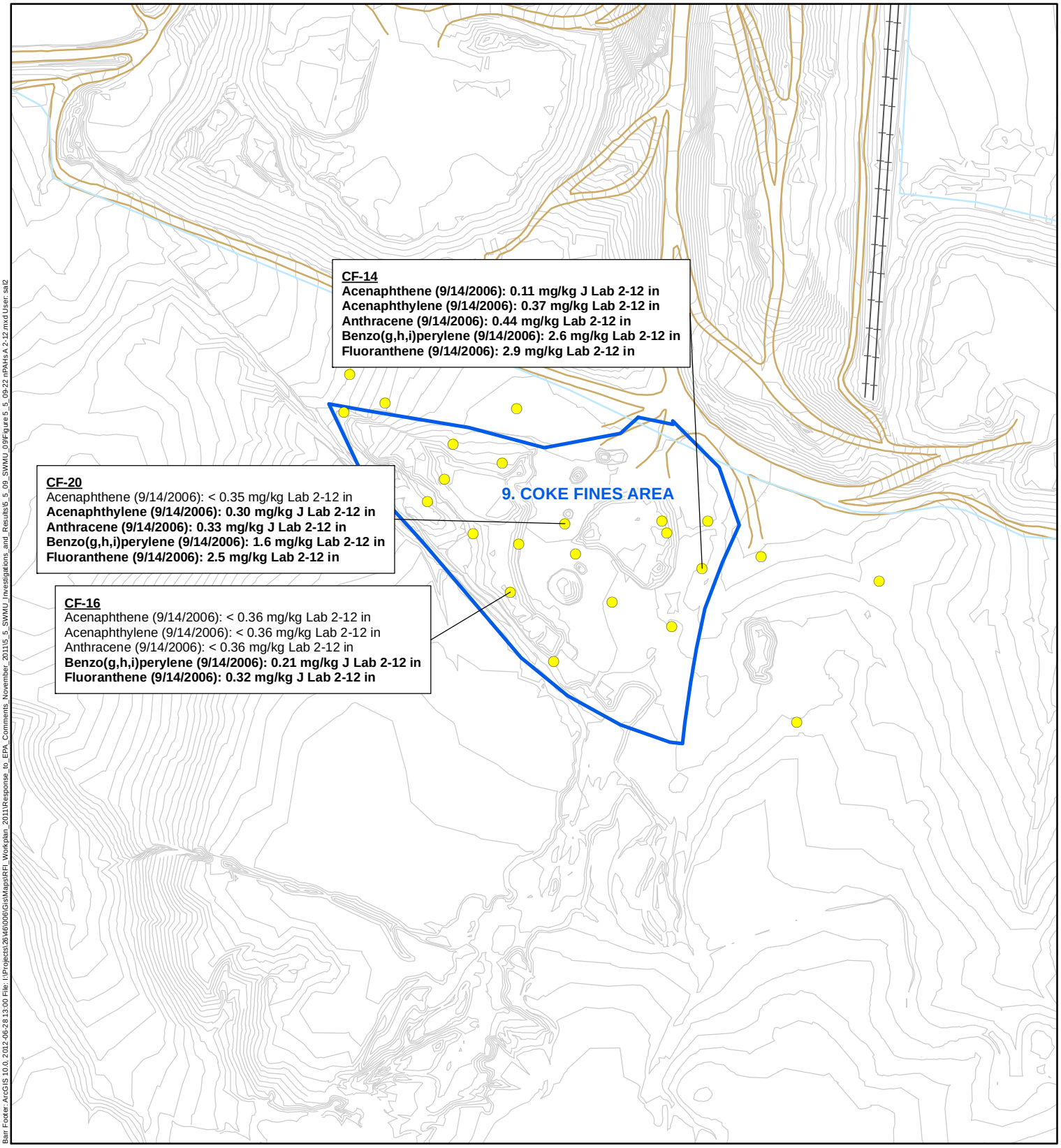
Bold font indicates that the parameter was detected.

N

Feet
300 0 300

Figure 5.5.9-21

SWMU 9
nPAHs GROUP A, 0-2 INCHES
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-06-28 13:00 File: I:\Projects\2614\0006\GisMaps\RFI_Workplan_2011\Response_to_EPA_Comments_November_201115_5_SWMU_Investigations_and_Results\5_5_09_SWMU_09\Figure 5_5_09-22 nPAHs A 2-12.mxd User: sal2

Sample Location

SWMU 9

Elevation Contour

Drainage

Railroad

Road

Former Plant Structures

Bold font indicates that the parameter was detected.

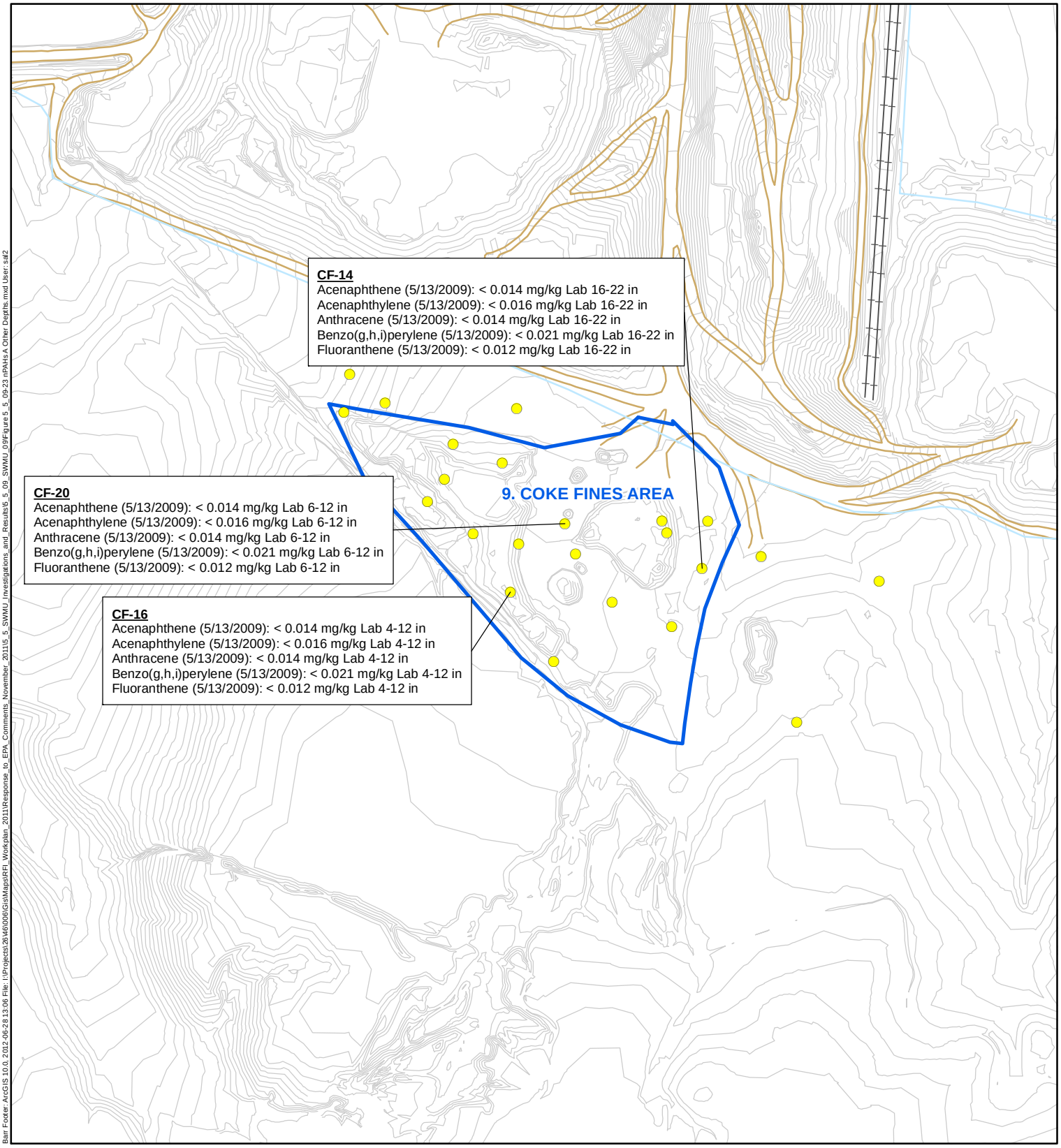
N

Feet

300 0 300

Figure 5.5.9-22

SWMU 9
nPAHs GROUP A, 2-12 INCHES
Rhodia Silver Bow Plant
Montana



Sample Location
SWMU 9
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures

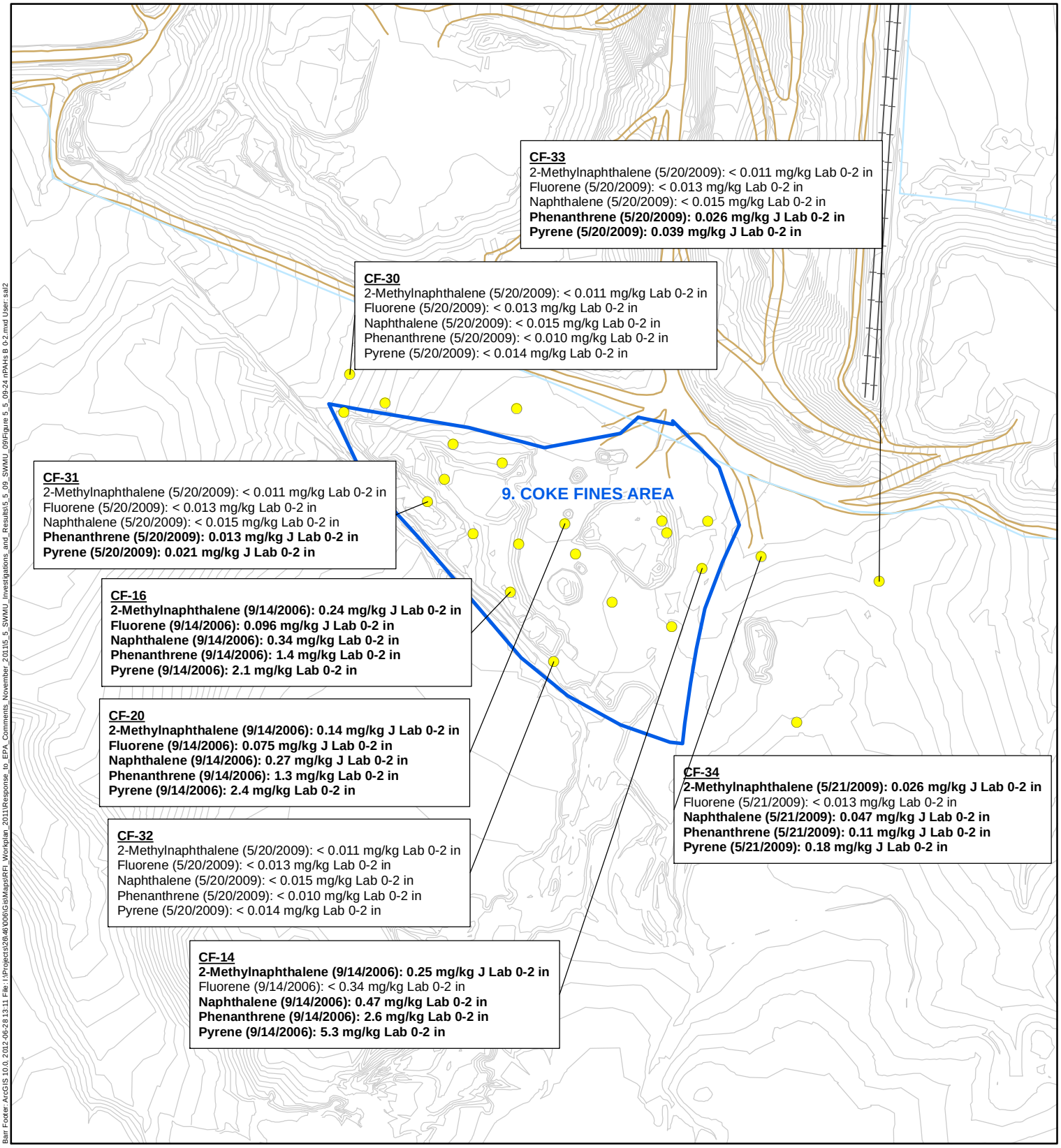
Bold font indicates that the parameter was detected.

N

Feet
300 0 300

Figure 5.5.9-23

SWMU 9
nPAHs GROUP A,
OTHER DEPTHS
Rhodia Silver Bow Plant
Montana



Sample Location
SWMU 9
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures

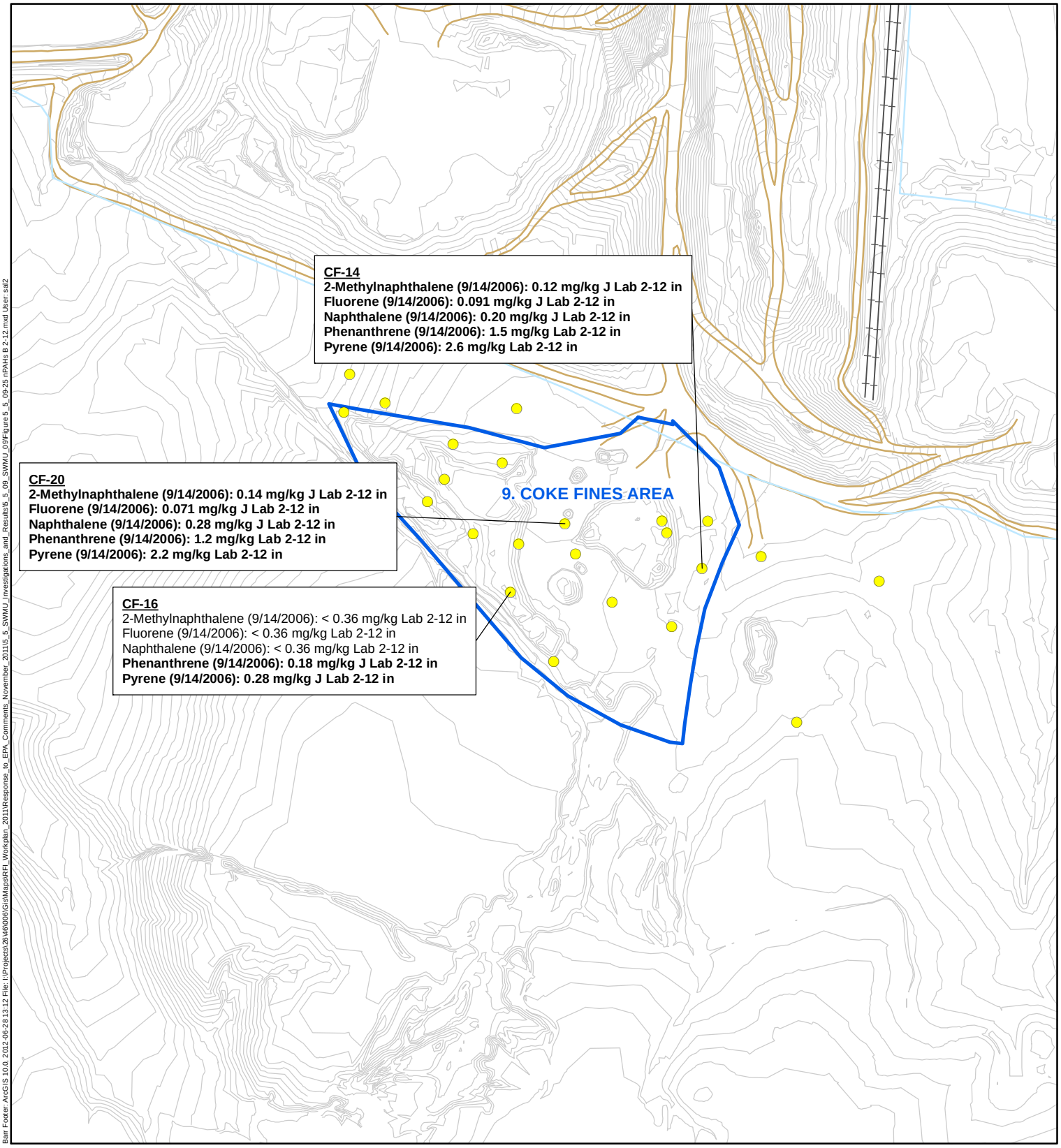
Bold font indicates that the parameter was detected.

N

Feet
300 0 300

Figure 5.5.9-24

SWMU 9
nPAHs GROUP B, 0-2 INCHES
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-06-28 13:12 File: I:\Projects\26\46\006\GisMaps\RFI_Workplan_2011\Response_to_EPA_Comments_November_2011\5_5_SWMU_Investigations_and_Results\5_5_09_SWMU_09\Figure 5_5_09-25 nPAHs B 2-12.mxd User: sal2

Sample Location

SWMU 9

Elevation Contour

Drainage

Railroad

Road

Former Plant Structures

Bold font indicates that the parameter was detected.

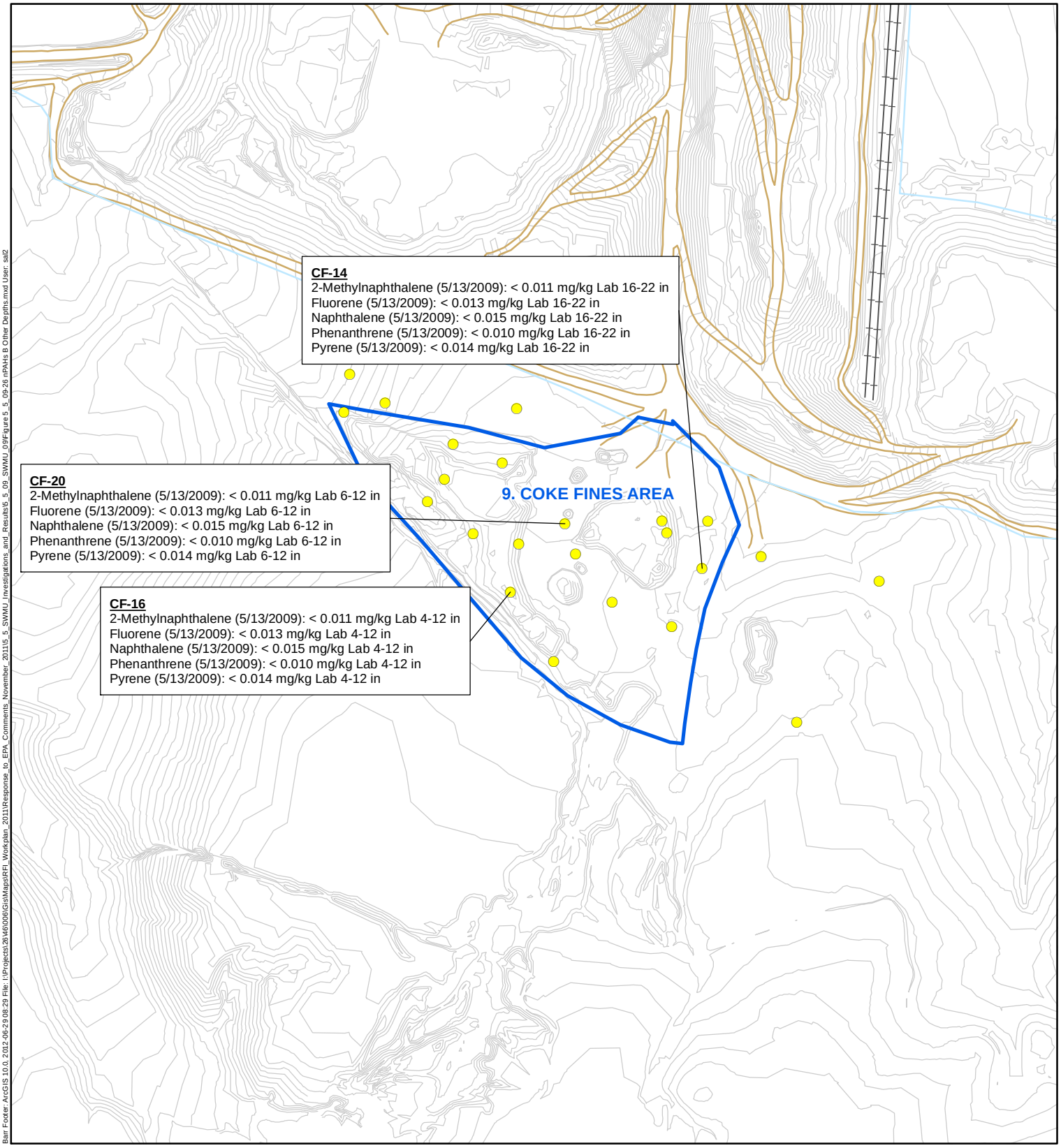
N

Feet

300 0 300

Figure 5.5.9-25

SWMU 9
nPAHs GROUP B, 2-12 INCHES
Rhodia Silver Bow Plant
Montana



Sample Location
SWMU 9
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures

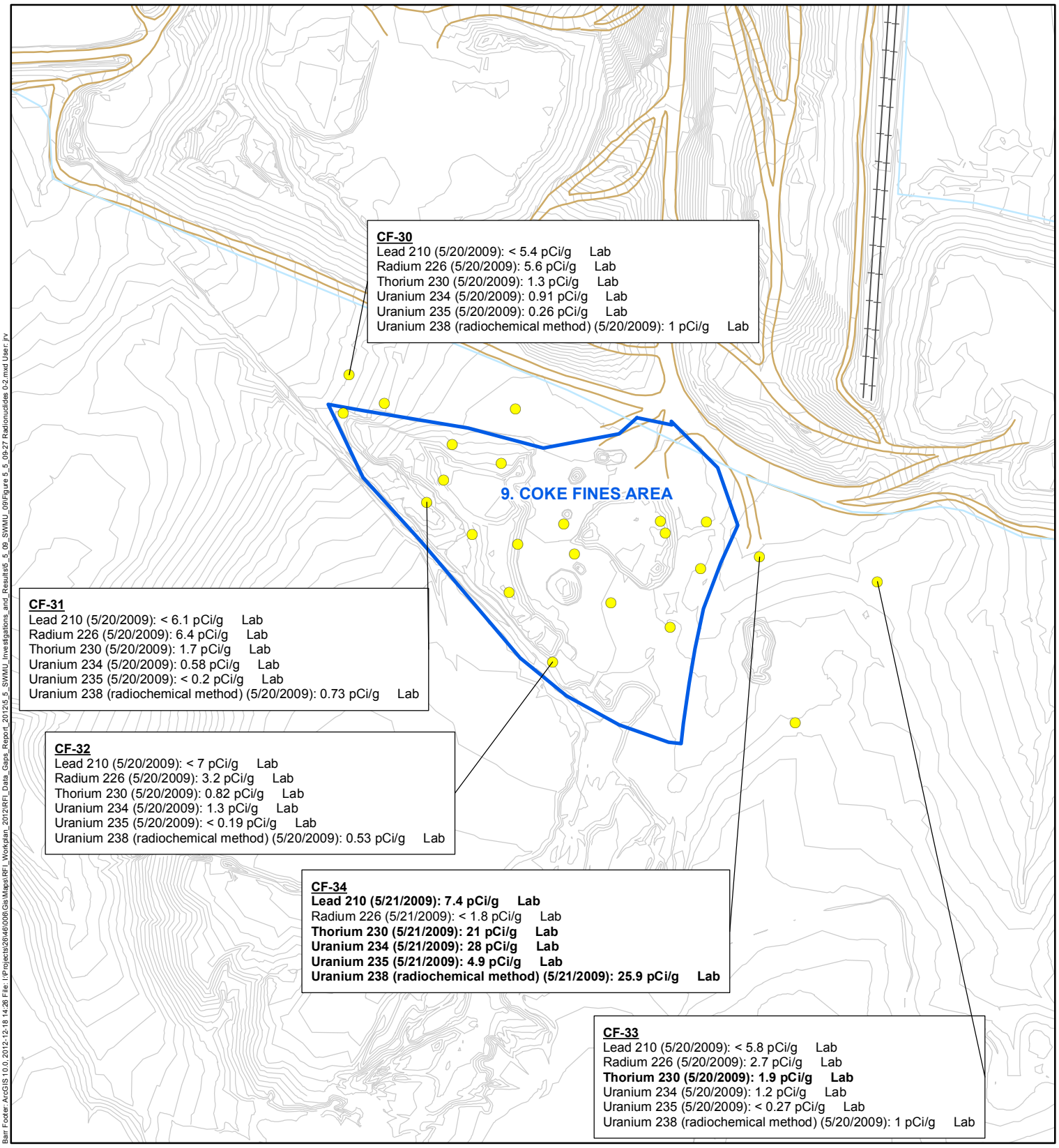
Bold font indicates that the parameter was detected.

N

Feet
300 0 300

Figure 5.5.9-26

SWMU 9
nPAHs GROUP B,
OTHER DEPTHS
Rhodia Silver Bow Plant
Montana



Sample Location
SWMU 9
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures

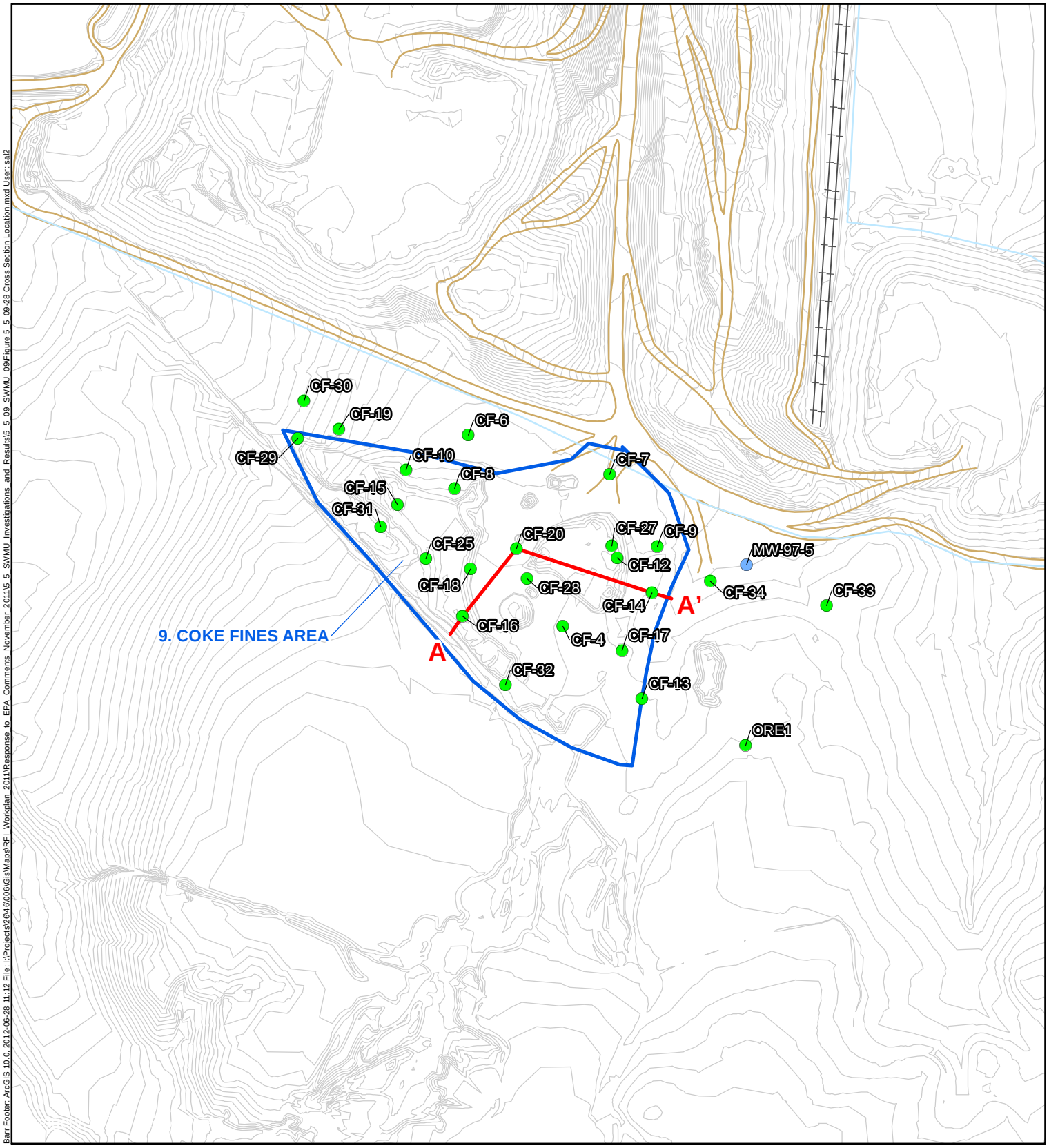
Bold font indicates that sample concentration is greater than the 95% UCL of mean Reference Area Concentration.

N

Feet
300 0 300

Figure 5.5.9-27

SWMU 9
RADIONUCLIDES, 0-2 INCHES
Rhodia Silver Bow Plant
Montana



Monitoring Well
Soil Sample
SWMU 9
Cross Section Location
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures

N

Feet
300 0 300

Figure 5.5.9-28

SWMU 9
CROSS SECTION LOCATION
Rhodia Silver Bow Plant
Montana

P:\Mpls\26 MT\46\26460006\WorkFiles\Figures_Graphics\Conceptual Section Through SWMU 9.AI 12-31-12

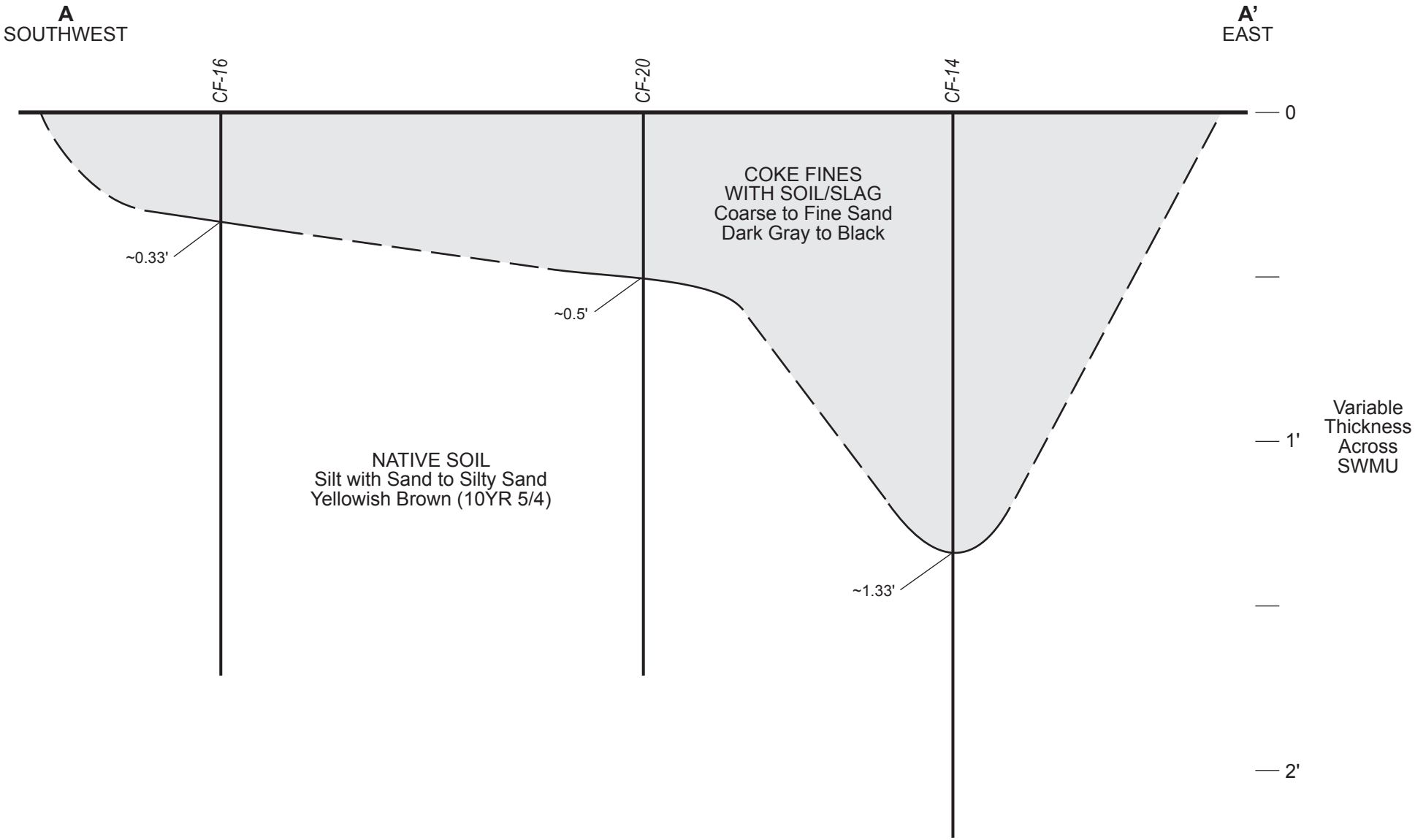


Figure 5.5.9-29

CONCEPTUAL SECTION THROUGH SWMU 9
Rhodia Silver Bow Plant
Montana

P:\Mpls\26 MT\46\26460006\WorkFiles\Figures_Graphics\Benzo(a)anthracene Diagram.AI 12-31-12

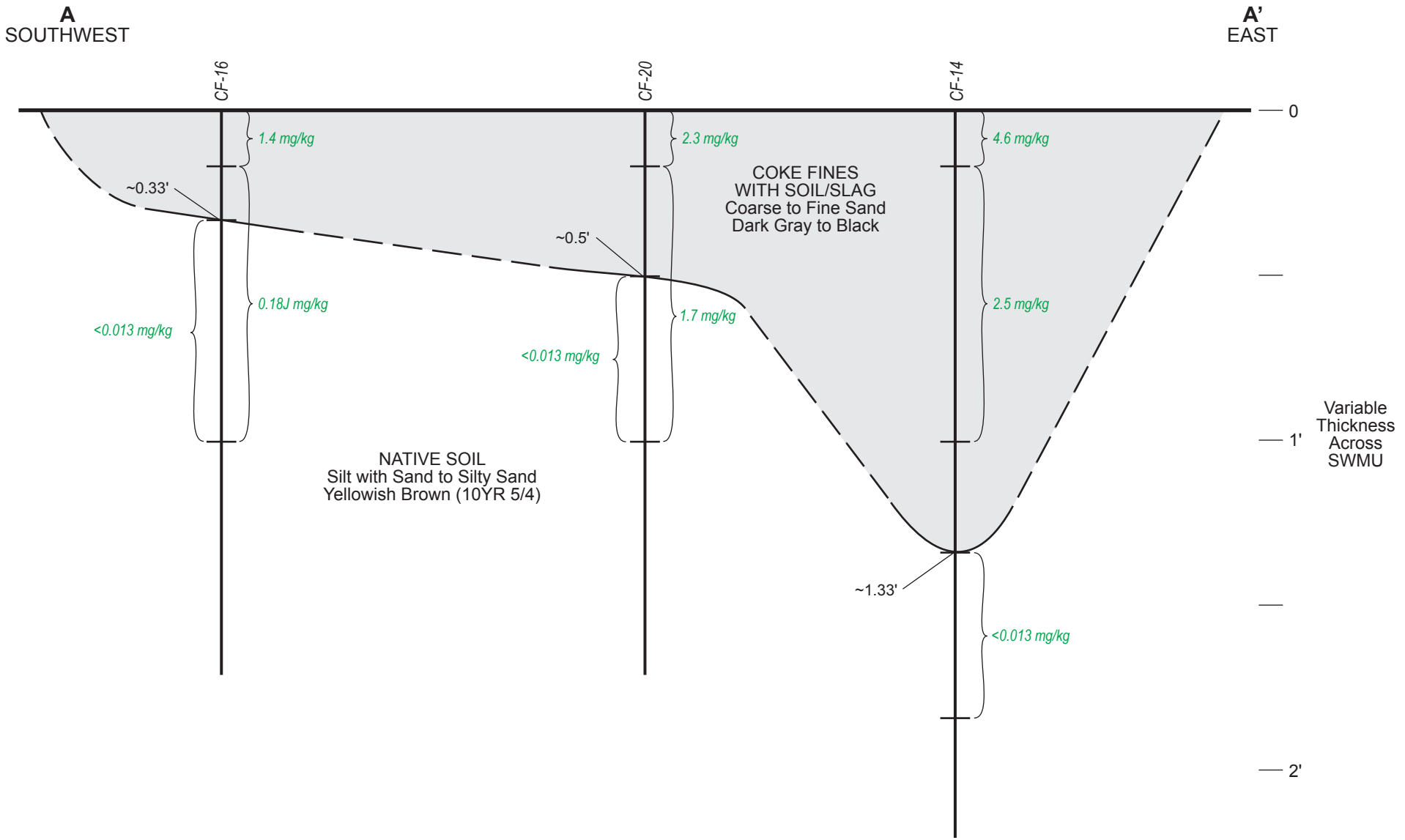


Figure 5.5.9-30

SWMU 9
BENZO(a)ANTHRACENE DIAGRAM
Rhodia Silver Bow Plant
Montana

P:\Mpls\26 MT\46\26460006\WorkFiles\Figures_Graphics\Chrysene Diagram.AI 12-31-12

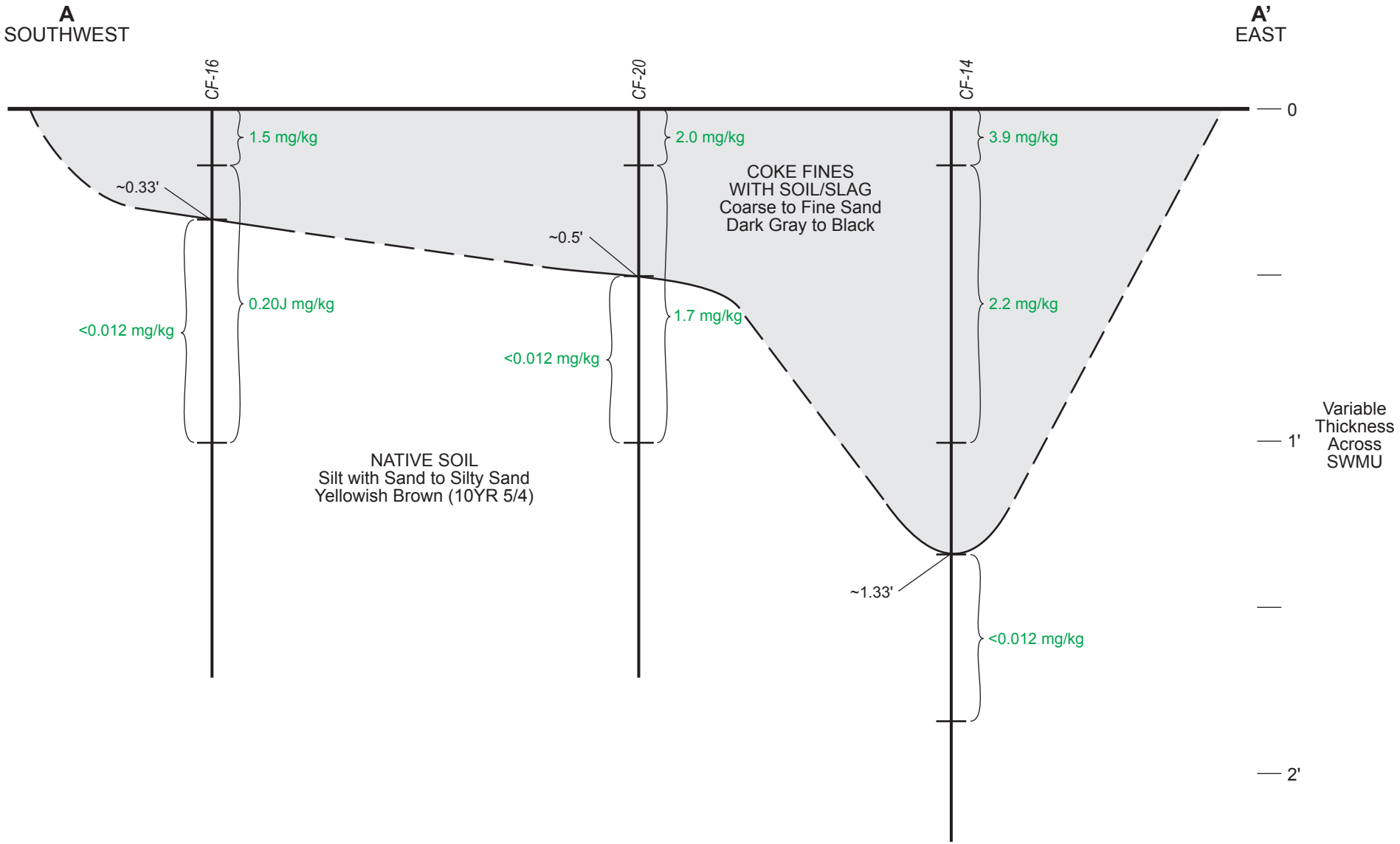


Figure 5.5.9-31

SWMU 9
CHRYSENE DIAGRAM
Rhodia Silver Bow Plant
Montana

P:\Mpls\26 MT\46\26460006\WorkFiles\Figures_Graphics\Acenaphthene Diagram.AI 12-31-12

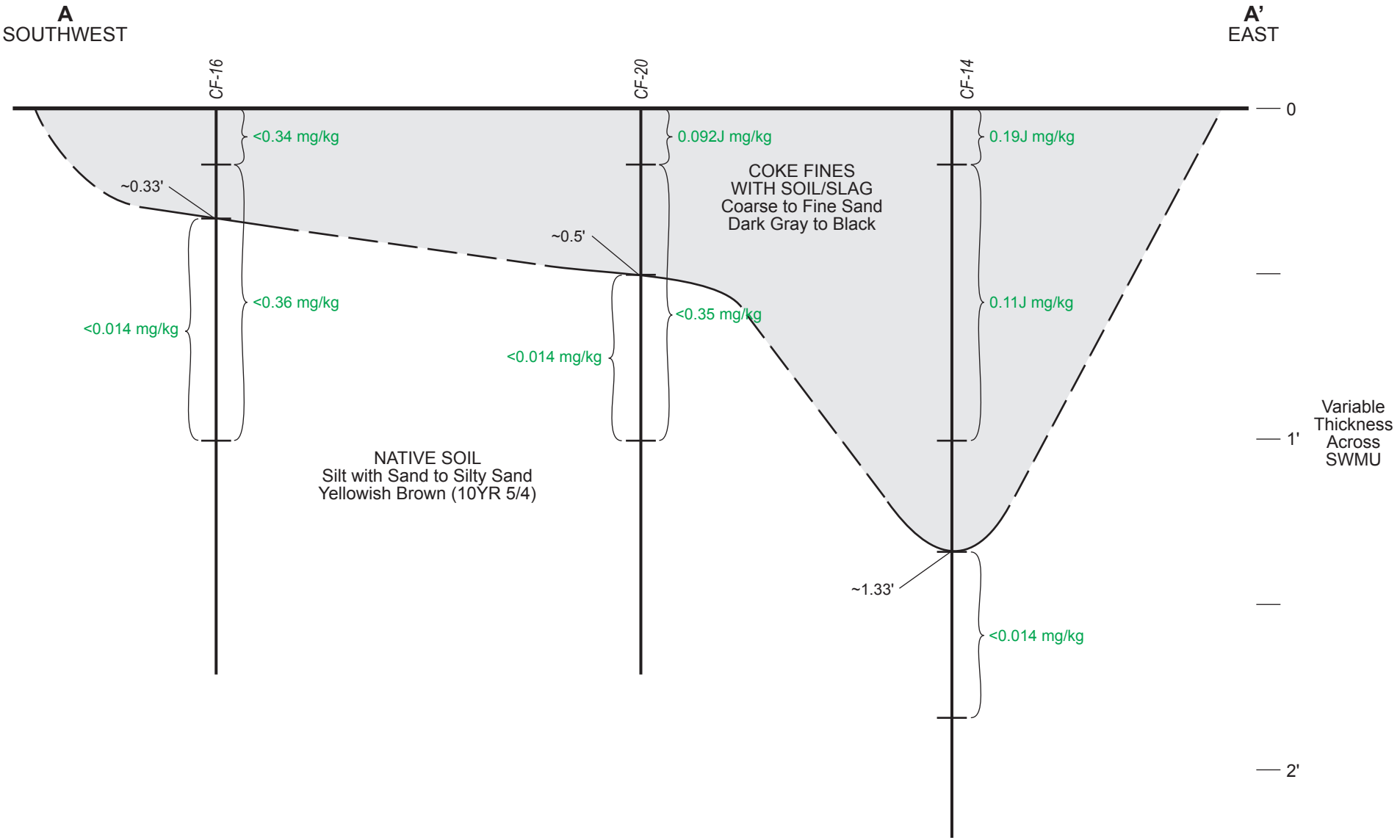


Figure 5.5.9-32

SWMU 9
ACENAPHTHENE DIAGRAM
Rhodia Silver Bow Plant
Montana

P:\Mpls\26 MT\46\26460006\WorkFiles\Figures_Graphics\Naphthalene Diagram.AI 12-31-12

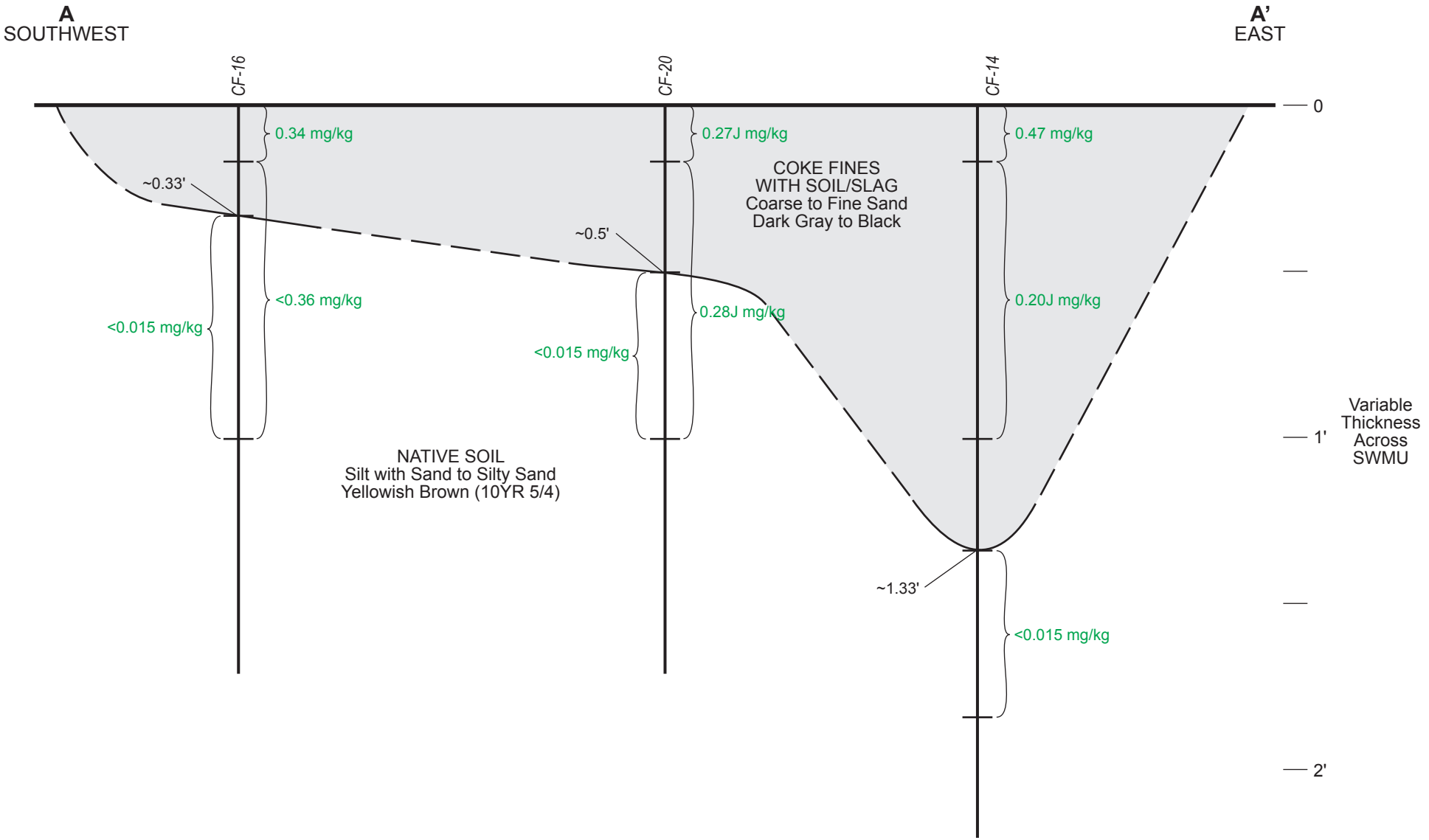


Figure 5.5.9-33

SWMU 9
NAPHTHALENE DIAGRAM
Rhodia Silver Bow Plant
Montana

Appendices

Appendix 5.5.9-A

Test Pit Logs

PROJECT NO. 26/46-0006.13

TEST PIT NO. CF-14 SHEET 1 OF 1

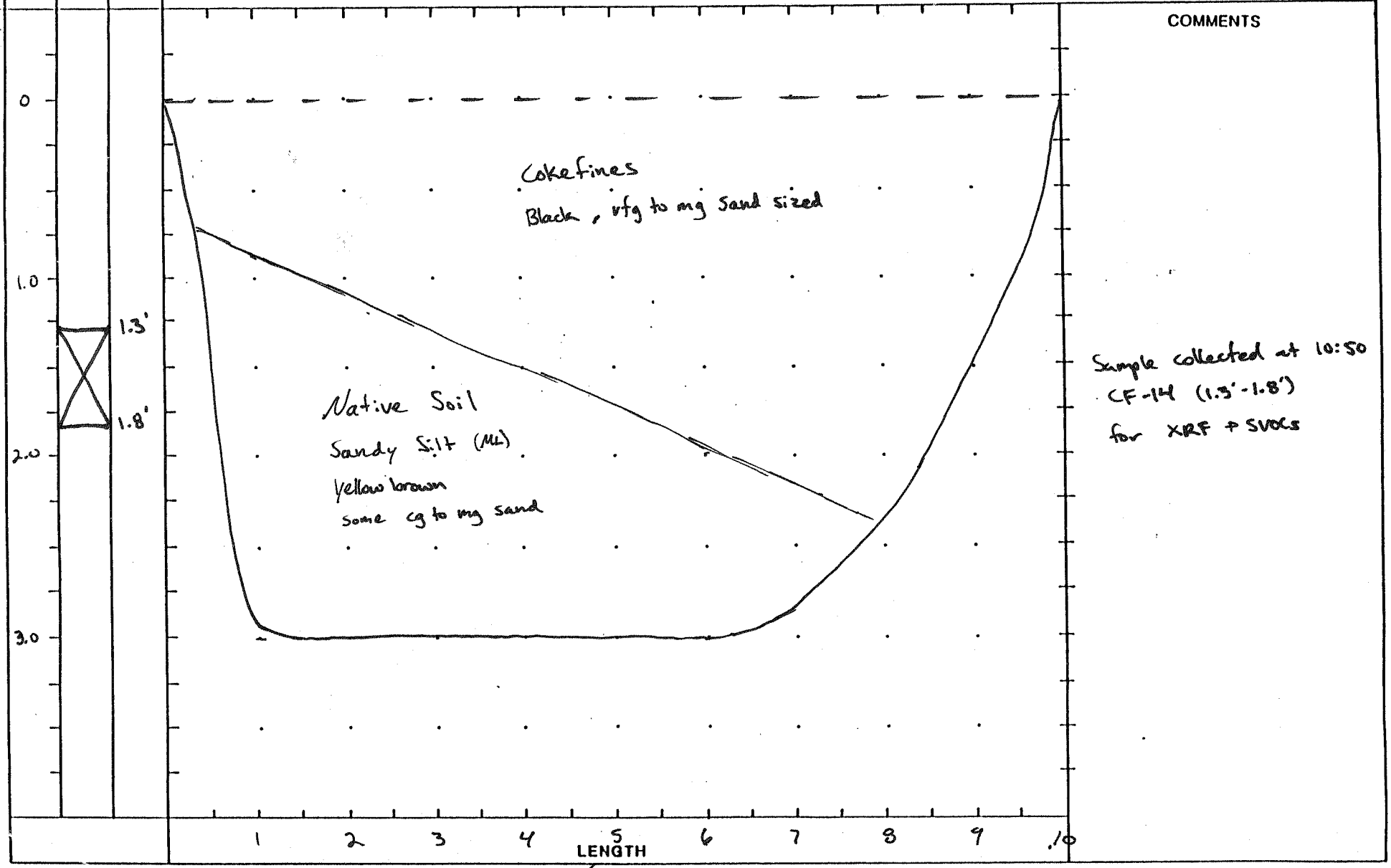
TEST PIT WALL LOG

PROJECT Rhodia RFI LOCATION SWMU-9 Coke Fines Area MAP OF E WALL OF PIT

ELEVATION N/A CONTRACTOR MT Reclamation & Landscaping DATE EXCAVATED 5/13/09

WATER LEVEL AND DATE N/A - Dry EXCAVATION METHOD Rubber Tire backhoe LOGGER SKN

APPROXIMATE DIMENSIONS LENGTH 10' WIDTH ~~10~~ 4' DEPTH 3' REMARKS



PROJECT NO. 26/46-0006.13

TEST PIT NO. CF-16 SHEET 1 OF 1

TEST PIT WALL LOG

PROJECT Rhodia RFI LOCATION SWMU-9 Coke Fines Area MAP OF S WALL OF PIT

ELEVATION N/A CONTRACTOR MT Reclamation & Landscaping DATE EXCAVATED 5/13/09

WATER LEVEL AND DATE N/A - Dry EXCAVATION METHOD _____ LOGGER SKN

APPROXIMATE DIMENSIONS LENGTH 4' WIDTH 2.5' DEPTH 1' REMARKS _____

ELEVATION	DEPTH BELOW SURFACE (ft)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
	0		
	0.5		-4"
	1		-12"

Coke fines & course piece of Blk material (slag?)
small gravel to fg sand size
Black - DK gy at top 1" (v dry)

Native Soil
Silt with sand (fg to mg) & some cg sand
Yellowish brown (10YR 5/4)

COMMENTS

Sample collected at 11:45
CF-16 (4-12")
for XRF & SVOCs

0 0.5 1 1.5 2 2.5 3 3.5 4

LENGTH (feet)

PROJECT NO. 26/46-0006-13

TEST PIT NO. CF-20 SHEET 1 OF 1

TEST PIT WALL LOG

PROJECT Rhodia RFI LOCATION SWMU-9 Coke Fines MAP OF N WALL OF PIT

ELEVATION N/A CONTRACTOR MT Reclamation & Landscaping DATE EXCAVATED 5/13/09

WATER LEVEL AND DATE N/A - Dry EXCAVATION METHOD Rubber Tire Backhoe LOGGER SKN

APPROXIMATE DIMENSIONS LENGTH 3' WIDTH 2.5' DEPTH 1.5' REMARKS

ELEVATION | DEPTH BELOW SURFACE (ft) | SAMPLE: INTERVAL, TYPE AND NUMBER

0

0.5 — 6"

1 — 12"

1.5

Coke Fines & Course Pieces (slag?) gravel sized (course) to fine sand

roots in Coke fines layer

Blade

Native Soil

Silt with sand & some cg sand

some roots near top 2" of Native

Yellowish Brown (10YR 5/4)

0 1 2 3 LENGTH

COMMENTS

Sample collected at 12:30

CF-20 (6-12")

for XRF & SVOCs