SWMU 20 - Scrap Steel and Equipment Burial Area

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5.5.20 SWMU 20 – Scrap Steel and Equipment Burial Area

The location of Solid Waste Management Unit (SWMU) 20 is shown on Figure 5.5.20-1a and SWMU 20 monitoring stations and sample locations are provided on Figure 5.5.20-1b. The Scrap Steel and Equipment Burial Area is a closed burial area that contains scrap steel and equipment, some of which may be contaminated with elemental phosphorus. SWMU 20 is located southeast of the Refuse Disposal Area (SWMU 19) and along the northern edge of the Tailings Basin and Water Recirculation System (SWMU 1) (*see* Figure 5.5.20-1b).

According to Plant records, the Scrap Steel and Equipment Burial Area (identified as Disposal Site No. 4 on the Engineering Drawings in Appendix 5.5.11-A) is approximately 250 feet by 350 feet. This burial area was closed in the late 1970s, and was capped with a multi-layer system illustrated in cross-section in Appendix 5.5.11-A as "Nos. 2, 3, 4 Waste Burial Sites", and consists of the following layers (from bottom to top):

1) 2 feet of graded and rolled clay fill
2) 6-inches of graded granular slag
3) Synthetic membrane (BURKE #3200, 20 mil-EPO (Polyolefin))
4) 2 feet granulated slag
5) 2 feet clay fill – contoured for drainage and hydroseeded

In the early 1990's the refuse area was covered with fines material from the Tailings Basin and Water Recirculation System. The fines material was removed from the east area of the basin and several feet of fines material was spread over the SWMU. The fines material cover was then fertilized, seeded with grass seed and reclaimed. Currently SWMU 20 has a vegetated grass cover on top of the engineered cover. The multi-layer cap minimizes infiltration of precipitation through the Scrap Steel and Equipment Burial Area.

The U.S. EPA collected a subsurface sample (SS-EPA-4; a.k.a. SCC-SS-4) from this SWMU in 1988. The U.S. EPA did not provide the sample depth or a boring log in their report (U.S. EPA 1989). This sample was analyzed for metals and SVOCs, and the analytical results are summarized in Tables 5.5.20-1 and 5.5.20-2, respectively. SVOCs were not detected in the subsurface sample. Chromium was the only metal in sample SS-EPA-4 that the U.S. EPA identified as being higher than the background concentrations determined for their study (U.S. EPA 1989). However, barium, beryllium, chromium, magnesium, potassium, sodium, and vanadium were all identified as being higher than the background concentrations presented in Section 4.4. The metals concentrations for

sample SS-EPA-4 are displayed on Figure 5.5.20-2. SVOCs were not displayed on a figure because no SVOCs were detected in the soil sample.

Groundwater quality impacts across this area are discussed in Section 5.3.

5.5.20.1 Conclusions

If the U.S. EPA selects a cover as the corrective measure for the Coarse Slag Pile and Tailing Basin and Water Recirculation System, SWMU 20 would be included under the cover given it is located along the north rim of the Tailing Basin and Water Recirculation System. However, final corrective measures will be determined at a later date.

The multi-layered horizontal barrier covering SWMU 20 described above, serves to protect the buried material and minimize infiltration of precipitation. Sampling of the cap materials and/or an engineering assessment of the current cap may be considered during future investigations. However, a cover over the Tailing Basin and Water Recirculation System would provide SWMU 20 additional protection by installing appropriate slopes.

Although the buried scrap steel and equipment may be contaminated with elemental phosphorus, buried elemental phosphorus will not migrate a significant distance in the subsurface. Elemental phosphorus at natural ground temperatures is a solid and, as demonstrated by the monitoring program at the Clarifier (*see* Section 5.5.2), elemental phosphorus does not migrate a significant distance (i.e., less than 30 feet) in groundwater.

5.5.20.2 References

U.S. EPA 1989. Analytical Results Report, Stauffer Chemicals Company, Silver Bow, Montana, TDD F08-8810-15; Prepared by Ecology and Environment for the Environmental Protection Agency; January 10, 1989.

Tables

Table 5.5.20-1
Soil Data - Metals
SWMU 20
Rhodia Silver Bow Plant
[concentrations in mg/kg]

Chemical Name / Analysis Location			Aluminum Lab	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	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	**41**	59
Background Maximum, Exceedances Underline				3.9	120	290	1.3	8.9	14000	48	9.5	301	35300	190	5700	1100	0.20	21	5300	0.70	1.7 (1)	620	1.0	83	380
Background 95% UCL, Exceedances *Italic*				1.0	40	*170*	*0.55*	1.1	4500	*12*	6.1	64	20600	35	*3700*	570	0.038	6.0	*3200*	0.47	0.35 (1)	*220*	0.46	*43*	98
Location ID	**Sample Date**	**Sample Type**																							
SS-EPA-4	8/9/1988	N	< 21700 J	< 6.0	< 11.6 J	***172***	***1.9***	< 3.2 J	< 102000 J	***103***	< 5.2 J	23.2	7410	< 6.4 BQQ	***7450***	208	< 0.1	< 7.2 J	***5660***	< 1.2 R	< 2.2 R	***2270***	< 0.41 BQQ	***125***	< 144 J

Table 5.5.20-2
Soil Data - SVOCs
SWMU 20
Rhodia Silver Bow Plant
[concentrations in mg/kg]

Chemical Name			1,2,4-Trichlorobenzene	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylnaphthalene	2-Nitroaniline	2-Nitrophenol	4-Chloro-3-methylphenol
Location ID	Sample Date	Sample Type															
SS-EPA-4	08/09/1988	N	< 0.34	< 0.34	< 0.34	< 0.34	< 1.7	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 1.7	< 0.34	< 0.34

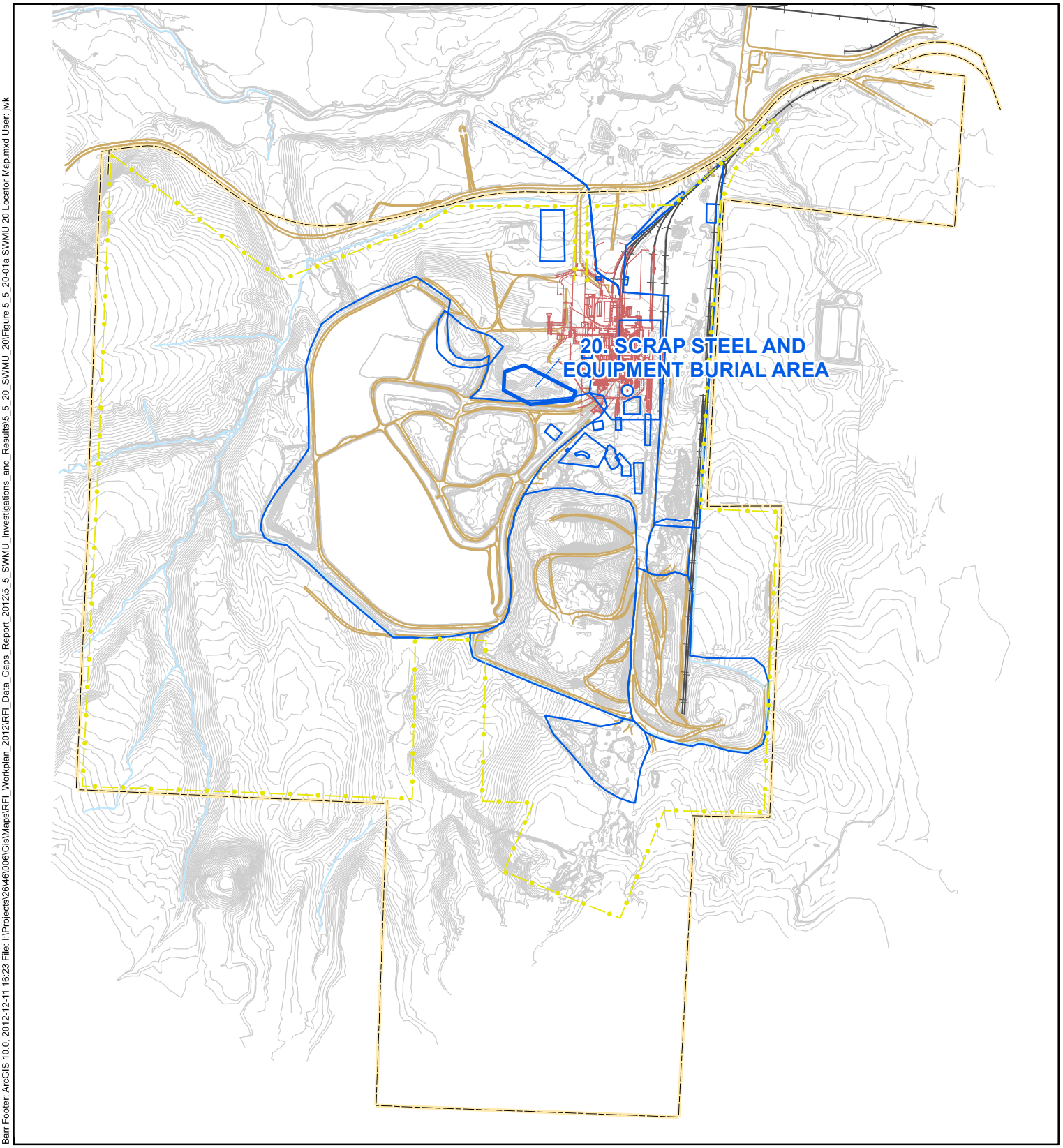
Table 5.5.20-2
Soil Data - SVOCs
SWMU 20
Rhodia Silver Bow Plant
[concentrations in mg/kg]

Chemical Name			4-Chloroaniline	Acenaphthylene	Benzoic acid	Benzyl alcohol	Bis(2-chloroethoxy)methane	Bis(2-chloroethyl)ether	Bis(2-chloroisopropyl)ether	Dimethyl phthalate	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Isophorone	Naphthalene	Nitrobenzene
Location ID	Sample Date	Sample Type														
SS-EPA-4	08/09/1988	N	< 0.34	< 0.34	< 1.7	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34

Table 5.5.20-2
Soil Data - SVOCs
SWMU 20
Rhodia Silver Bow Plant
[concentrations in mg/kg]

		Chemical Name	N-Nitrosodi-n-propylamine	o-Cresol	p-Cresol	Phenol
Location ID	Sample Date	Sample Type				
SS-EPA-4	08/09/1988	N	< 0.34	< 0.34	< 0.34	< 0.34

Figures



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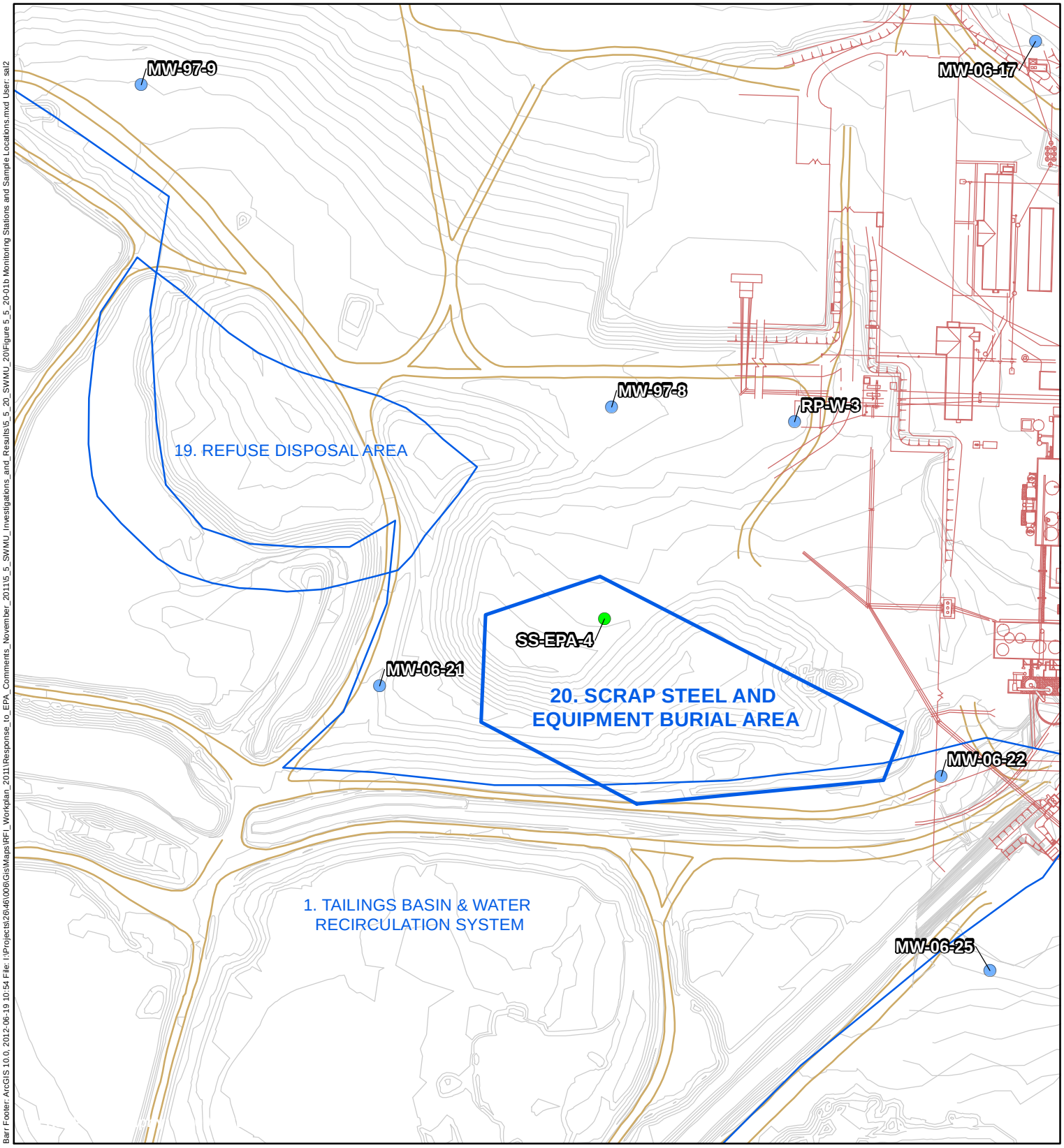
SWMU 20
Other SWMUs
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures
Property Boundary
Fence Line

N

Feet
1,000 0 1,000

Figure 5.5.20-1a

SWMU 20 LOCATION
Rhodia Silver Bow Plant
Montana



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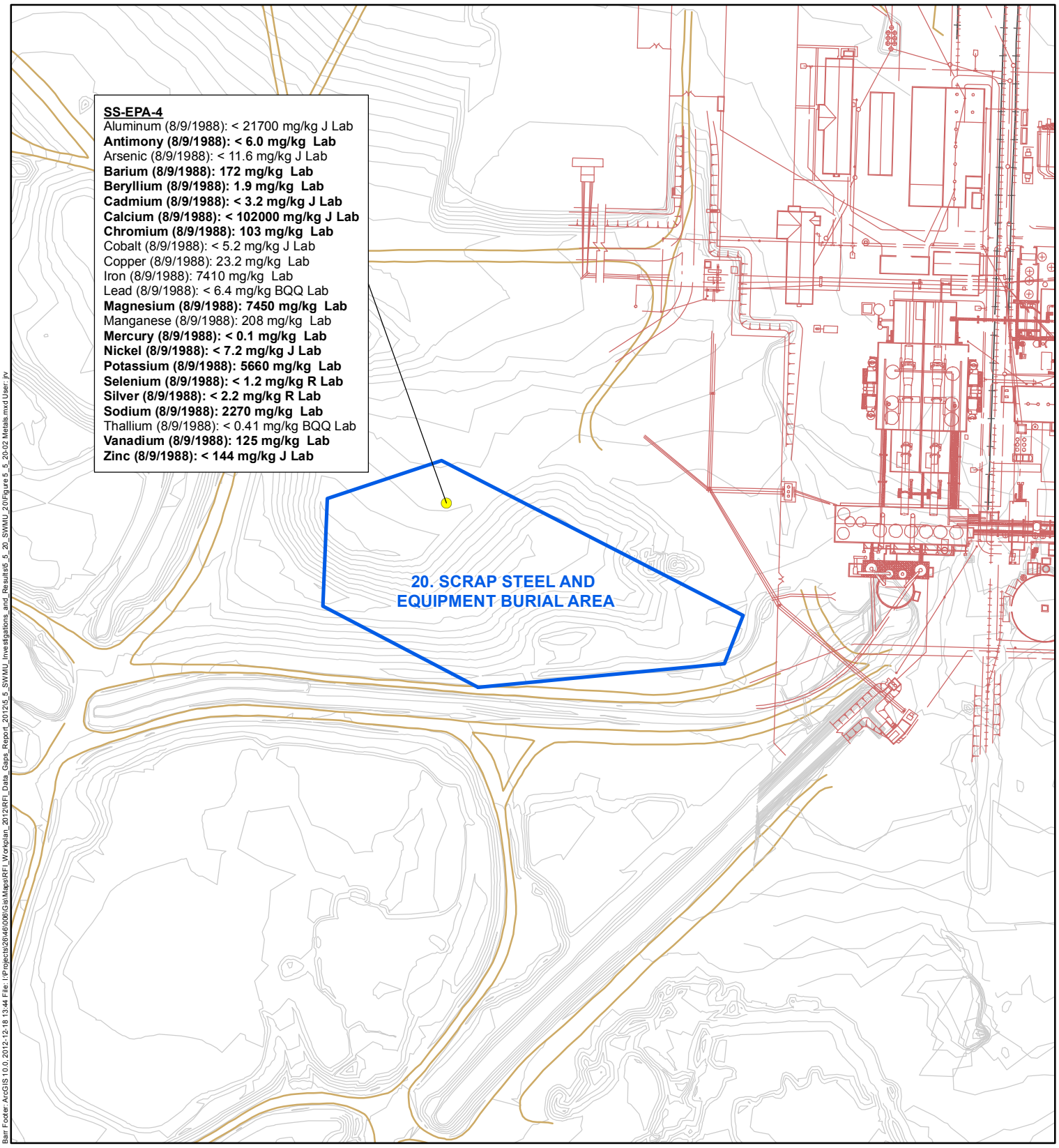
- Monitoring Well
- Soil Sample
- SWMU 20
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
200 0 200

Figure 5.5.20-1b

SWMU 20
MONITORING STATIONS
AND SAMPLE LOCATIONS
Rhodia Silver Bow Plant
Montana



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Sample Location
SWMU 20
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
200 0 200

Figure 5.5.20-2

SWMU 20
METALS
Rhodia Silver Bow Plant
Montana