Section 4.1 Upstream Surface Water Quality

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4.1 Upstream Surface Water Quality

Upstream surface water quality monitoring stations were established along Sheep Gulch and Silver Bow Creek at the locations shown on Figure 4.1-1. Two rounds of surface water samples were collected during the Resource Conservation and Recovery Act (RCRA) Facility Investigation Report (RFI), one targeting higher (i.e. spring) flow and the other targeting lower (i.e. fall) flow conditions as described in the Final RFI Work Plan (Barr, 2009). Surface water samples were collected in accordance with the Standard Operating Procedures (SOPs) for Collection of Surface Water Samples included in the Field Sampling Plan of the Final RFI Work Plan (2009). Water was collected from approximately mid-depth of midstream by a battery powered peristaltic pump, through new PVC and silicone tubing at each location. The surface water samples were analyzed for general and site-specific parameters, total and dissolved metals, SVOCs, VOCs and radionuclides. These upstream concentrations will be compared to the surface water concentrations for the other surface water stations established along Sheep Gulch and Silver Bow Creek, respectively.

4.1.1 Sheep Gulch

Stations SW-20 and SW-8 are located in Sheep Gulch upstream of the tailing basin and were established to provide upstream concentrations for surface water in Sheep Gulch as detailed in Section 5.3 of the Environmental Protection Agency (EPA)-approved Final RFI Work Plan (Barr, 2009). SW-20 is located on the branch of Sheep Gulch that flows from the Renewable Energy Corporation Advanced Silicon Materials, Inc. (REC) Plant, and consequently, surface water quality is strongly influenced by REC's discharge of wastewater ((NPDES) Permit No. MT0030350). SW-8 is located below the confluence of the main stem and branch from the REC Plant. The main stem rarely has surface water flow and was dry during both sampling events conducted in 2008.

A surface water sample (SW-SHPGLCH) was collected from Sheep Gulch upstream of the Silver Bow Plant in 1998 (*see* Figure 4.1-1). However, the analytical results for this sample are not included in the upstream data set since the laboratory did not achieve the low detection limits that were specified for the RFI.

4.1.1.1 General & Site-specific Parameters

The analytical results for the general and site-specific parameters included in the upstream data set for Sheep Gulch are summarized in Table 4.1-1. The maximum detected concentration or the maximum detection limit for each parameter are also summarized in the table.

The analytical results are generally consistent between the two upstream locations and over the time period sampled, although chloride was higher in the May sample from SW-8 and alkalinity, carbonate as $CaCO_3$ was higher in the May sample from SW-20. Elemental phosphorus was not detected in the upstream samples from Sheep Gulch and the total phosphorus concentrations were consistent between the two upstream locations and over the time period sampled at about 0.2 mg/L.

4.1.1.2 Metals

The analytical results for the metals included in the upstream data set for Sheep Gulch are summarized in Table 4.1-2 along with the maximum detected concentration or the maximum detection limit.

The metals concentrations are generally consistent between the two upstream stations. In addition, the dissolved and total metals concentrations are generally consistent in the same samples, with the exception of cobalt. The dissolved cobalt concentrations were consistently higher than the total concentrations by factors between 1.3 and 6. Since dissolved concentrations cannot exceed the total concentrations, the dissolved cobalt concentrations were removed from the upstream data set. The water filtration process may have added cobalt to the dissolved fraction. No other anomalies were identified in the upstream data set.

4.1.1.3 SVOCs

The analytical results for the SVOCs included in the upstream data set for Sheep Gulch are summarized in Table 4.1-3 along with the maximum detected concentration or the maximum detection limit. SVOCs were not detected in the upstream samples, with the exception of di-n-octyl phthalate and diethyl phthalate. The sample-specific detection limit is shown in parenthesis after the detected concentration in Table 4.1-3.

Di-n-octyl phthalate and diethyl phthalate are common laboratory contaminants as they are an ingredient in plastics that are used in sample collection and laboratory analytical equipment. Although they may not be present in the surface water, the maximum detected concentrations or maximum detection limits were selected for comparison purposes as being representative of the sampling and analytical system influence.

4.1.1.4 VOCs

The analytical results for the VOCs included in the upstream data set for Sheep Gulch are summarized in Table 4.1-4 along with the maximum detected concentration or the maximum detection limit. VOCs were not detected in the upstream samples, with the following exceptions:

toluene in the May samples from both stations; naphthalene in the May sample from SW-8; and carbon disulfide in the May sample from SW-8. The sample-specific detection limit is shown in parenthesis after the detected concentration in Table 4.1-4.

Toluene, naphthalene, and carbon disulfide are common laboratory contaminants. These VOCs were not detected in the September samples and naphthalene was not detected in the SVOC analysis at a detection limit of 0.022 µg/L as compared to 0.77 µg/L reported for the VOC analysis. Although these VOCs may not be present in the surface water, the maximum detected concentrations or maximum detection limits were selected for comparison purposes as being representative of the sampling and analytical system influence.

4.1.1.5 Radionuclides

The analytical results for the radionuclides included in the upstream data set for Sheep Gulch are summarized in Table 4.1-5 along with the maximum detected concentration or the maximum detection limit. Radionuclides were not detected in the upstream samples, with the exception of gross alpha in the May sample from SW-8 and Ra-228 in the September sample from SW-20.

4.1.2 Silver Bow Creek

Station SW-14 is located in Silver Bow Creek upstream of the Silver Bow Plant Area and was established to provide upstream concentrations for surface water in Silver Bow Creek for the RFI.

Two additional upstream surface water samples were collected by EPA for other investigations related to the Silver Bow Plant. In 1988, EPA conducted a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Site Investigation and collected sample SW-EPA-1 (a.k.a. SCC-SW-1) upstream of the Silver Bow Plant. EPA conducted an Expanded Site Investigation in 2003 and collected sample ESI-SBC-1. The location of ESI-SBC-1 is shown on Figure 4.1-1. SW-EPA-1 is not included in the upstream data set since the laboratory did not achieve the low detection limits that were specified for the RFI. ESI-SBC-1 is not included in the upstream data set because the surface water sample was only analyzed for a small subset of the surface water parameters. More importantly, these samples are no longer representative of upstream surface water concentrations because Silver Bow Creek was reconstructed and no longer flows through the same stream channel where these samples were collected.

4.1.2.1 General & Site-specific Parameters

The analytical results for the general and site-specific parameters included in the upstream data set for Silver Bow Creek are summarized in Table 4.1-6. The maximum detected concentration or the maximum detection limit for each parameter are also summarized in the table.

The general and site-specific parameter concentrations are similar between the May and September samples. Elemental phosphorus was not detected in the upstream samples from Silver Bow Creek, and the total phosphorus concentrations were consistent between May and September at about 0.5 mg/L.

4.1.2.2 Metals

The analytical results for the metals included in the upstream data set for Silver Bow Creek are summarized in Table 4.1-7 along with the maximum detected concentration or the maximum detection limit.

The metals concentrations are similar between the May and September samples. The total metals concentrations are generally higher than the dissolved metal concentrations especially for iron and lead where, in May, the total concentration is about 5 times the dissolved fraction concentration, and in September, about 15 times the dissolved fraction concentration . The total cadmium, copper, manganese and zinc concentrations are about 2 times higher than the dissolved fraction concentrations. This indicates that metal constituents are being carried on the suspended sediment in the surface water of Silver Bow Creek.

4.1.2.3 SVOCs

The analytical results for the SVOCs included in the upstream data set for Silver Bow Creek are summarized in Table 4.1-8 along with the maximum detected concentration or the maximum detection limit.

SVOCs were not detected in the upstream samples, with the exception of three polynuclear aromatic hydrocarbon (PAH) constituents. Very low concentrations benzo(a)anthracene and phenanthrene were detected in the September sample, and a very low concentration of pyrene was detected in the May sample. The sample-specific detection limit is shown in parenthesis after the detected concentration in Table 4.1-8. The maximum detected concentrations or maximum detection limits were selected for comparison purposes as being representative of the sampling and analytical system influence.

4.1.2.4 VOCs

The analytical results for the metals included in the upstream data set for Silver Bow Creek are summarized in Table 4.1-9 along with the maximum detected concentration or the maximum detection limit.

VOCs were not detected in the upstream samples, with the exception of acetone and chloroform. The sample-specific detection limit is shown in parenthesis after the detected concentration in Table 4.1-9. Very low concentrations of these VOCs were detected in the May samples, but were not detected in the September sample. The maximum detected concentrations or maximum detection limits were selected for comparison purposes as being representative of the sampling and analytical system influence.

4.1.2.5 Radionuclides

The analytical results for the radionuclides included in the upstream data set for Silver Bow Creek are summarized in Table 4.1-10 along with the maximum detected concentration or the maximum detection limit. Gross alpha and gross beta were detected in both surface water samples at consistent concentrations. Ra-226 and Ra-228 were not detected in the upstream samples so the maximum detection limit was selected for comparison purposes.

4.1.3 Conclusions and Recommendations

The upstream data set consists of two rounds of surface water samples that were analyzed for general and site-specific parameters, metals, SVOCs, VOCs and radionuclides. Due to the limited number of samples, the maximum detected concentrations or the maximum detection limits were selected as the upstream concentrations for comparison purposes, as recommended by EPA in their September 21, 2011 letter. These upstream concentrations will be compared to the surface water concentrations for the other surface water stations established along Sheep Gulch and Silver Bow Creek, respectively.

4.1.4 References

Barr, 2009. Final Phase 1 RCRA Facility Investigation Work Plan, Corrective Action Order on Consent, Docket No. RCRA-08-2004-0001, Rhodia Silver Bow Plant, Butte, Montana, March 25, 2009.

Tables

Table 4.1-1
Upstream Surface Water Data - General and Site-Specific Parameters
Sheep Gulch
Rhodia Silver Bow Plant
[concentrations in mg/l]

Location ID	Sample Date	Alkalinity, bicarbonate as CaCO3	Alkalinity, carbonate as CaCO3	Chloride	Fluoride	Nitrate + Nitrite	Nitrogen, ammonia as N	Phosphorus, elemental (white)	Phosphorus, total	Sulfate
SW-8	05/23/2008	**170**	< 2	**125**	**0.5**	**0.47**	**0.29**	< 0.0000234	**0.21**	**22.8**
	09/20/2008	**198**	< 2	**14.2**	**0.7**	**0.09**	< 0.05	< 0.0000234	**0.18**	**21.3**
SW-20	05/23/2008	**107**	**41**	**50.7**	**0.6**	**0.32**	**0.14**	< 0.0000234	**0.24**	**19.4**
	09/21/2008	**357**	< 2	**45.2**	**0.7**	**0.41**	< 0.05	< 0.0000234	**0.19**	**35.6**
Upstream Concentation										
Maximum		**357**	**41**	**125**	**0.7**	**0.47**	**0.29**	**0.0000234**	**0.24**	**35.6**

Table 4.1-2
Upstream Surface Water Data - Metals
Sheep Gulch
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	Fraction	Antimony		Arsenic		Barium		Beryllium		Cadmium		Calcium		Chromium		Cobalt		Copper		Iron		Lead		Magnesium		Manganese		Mercury		Nickel		Potassium		Selenium		Silver		Sodium	
SW-8	05/23/2008	Dissolved	**0.33**	--	**4.2**	--	**14.1**	--	< 0.02	--	**0.03**	--	**50400**	--	**0.5**	--	**0.40**	--	**6.4**	--	< 20	--	**0.1**	--	**7430**	--	**3.3**	--	< 0.2	--	**3.0**	--	< 2000	--	< 1.0	--	< 0.02	--	**94200**	--
		Total	--	**0.30**	--	**4.4**	--	**15.5**	--	< 0.02	--	**0.02**	--	**54100**	--	**0.8**	--	**0.12**	--	**8.6**	--	**50**	--	**0.22**	--	**7890**	--	**3.87**	--	< 0.2	--	**3.0**	--	< 2000	--	< 1.0	--	< 0.02	--	**106000**
	09/20/2008	Dissolved	**0.30**	--	**4.7**	--	**15.51**	--	< 0.02	--	**0.03**	--	**49400**	--	< 0.7	--	**0.60**	--	**3.8**	--	< 20	--	**0.08**	--	**11800**	--	**1.9**	--	< 0.2	--	**2.4**	--	< 2000	--	< 1.0	--	< 0.02	--	**31000**	--
		Total	--	**0.24**	--	**4.7**	--	**15.92**	--	< 0.02	--	< 0.02	--	**49800**	--	< 0.7	--	**0.12**	--	**5.0**	--	**57**	--	**0.19**	--	**11600**	--	**1.72**	--	< 0.2	--	**2.3**	--	< 2000	--	< 1.0	--	< 0.02	--	**31300**
SW-20	05/23/2008	Dissolved	**0.31**	--	**4.4**	--	**9.40**	--	< 0.02	--	< 0.02	--	**42300**	--	**0.5**	--	**0.15**	--	**6.8**	--	< 20	--	**0.07**	--	**7300**	--	**2.61**	--	< 0.2	--	**2.5**	--	< 2000	--	< 1.0	--	< 0.02	--	**43400**	--
		Total	--	**0.29**	--	**4.4**	--	**11.0**	--	< 0.02	--	< 0.02	--	**46000**	--	**0.6**	--	**0.11**	--	**8.8**	--	**43**	--	**0.17**	--	**7860**	--	**3.91**	--	< 0.2	--	**2.5**	--	< 2000	--	< 1.0	--	< 0.02	--	**48800**
	09/21/2008	Dissolved	**0.25**	--	**4.5**	--	**30.11**	--	< 0.02	--	< 0.02	--	**53200**	--	< 0.7	--	**0.43**	--	**4.9**	--	< 20	--	**0.08**	--	**12500**	--	**1.48**	--	< 0.2	--	**2.5**	--	**2030**	--	< 1.0	--	< 0.02	--	**120000**	--
		Total	--	**0.21**	--	**4.5**	--	**36.54**	--	< 0.02	--	< 0.02	--	**56500**	--	< 0.9	--	**0.12**	--	**7.3**	--	**44**	--	**0.26**	--	**12700**	--	**1.99**	--	< 0.2	--	**2.6**	--	**2110**	--	< 1.0	--	< 0.02	--	**126000**
Upstream Concentation																																						
Maximum			**0.31**	**0.29**	**4.5**	**4.5**	**30.11**	**36.54**	**0.02**	**0.02**	**0.03**	**0**	**53200**	**56500**	**0.5**	**0.6**	**0.60**	**0.12**	**6.8**	**8.8**	**20**	**44**	**0.08**	**0.26**	**12500**	**12700**	**2.61**	**3.91**	**0.2**	**0.2**	**2.5**	**2.6**	**2030**	**2110**	**1.0**	**1.0**	**0.02**	**0.02**	**120000**	**126000**

Table 4.1-2
Upstream Surface Water Data - Metals
Sheep Gulch
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	Fraction	Thallium		Uranium		Vanadium	Zinc
SW-8	05/23/2008	Dissolved	< 0.02	--	**1.4**	--	**2.3**	**5.0**
		Total	--	< 0.02	--	**1.4**	--	--
	09/20/2008	Dissolved	< 0.02	--	**2.14**	--	**1.8**	**5.9**
		Total	--	< 0.02	--	**2.15**	--	--
SW-20	05/23/2008	Dissolved	< 0.02	--	**1.4**	--	**2.1**	**3.5**
		Total	--	< 0.02	--	**1.4**	--	--
	09/21/2008	Dissolved	< 0.02	--	**2.43**	--	**1.7**	**7.4**
		Total	--	< 0.02	--	**2.36**	--	--
Upstream Concentation								
Maximum			**0.02**	**0.02**	**2.43**	**2.36**	**2.1**	**7.4**

Table 4.1-3
Upstream Surface Water Data - SVOCs
Sheep Gulch
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	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	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene
SW-8	05/23/2008	< 0.016	< 0.022	< 0.021	< 0.029	< 0.031	< 0.058	< 0.047	< 2.2 R	< 0.17	< 0.018	< 0.033	< 0.041
	09/20/2008	< 0.016	< 0.022	< 0.021	< 0.029	< 0.031	< 0.058	< 0.047	< 2.2	< 0.17 R	< 0.018	< 0.033	< 0.041
SW-20	05/23/2008	< 0.016	< 0.022	< 0.021	< 0.029	< 0.031	< 0.058	< 0.047	< 2.2 R	< 0.17	< 0.018	< 0.033	< 0.041
	09/21/2008	< 0.016	< 0.022	< 0.021	< 0.029	< 0.031	< 0.058	< 0.047	< 2.2	< 0.17 R	< 0.018	< 0.033	< 0.041
Upstream Concentation													
Maximum		**0.016**	**0.022**	**0.021**	**0.029**	**0.031**	**0.058**	**0.047**	**2.2**	**0.17**	**0.018**	**0.033**	**0.041**

Table 4.1-3
Upstream Surface Water Data - SVOCs
Sheep Gulch
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	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-Chlorophenyl phenyl ether	4-Nitroaniline
SW-8	05/23/2008	< 0.054	< 0.025	< 0.026	< 0.024	< 0.063	< 0.43	< 0.029	< 0.026	< 0.037	< 0.025	< 0.027	< 0.019
	09/20/2008	< 0.054	< 0.025	< 0.026	< 0.024	< 0.063	< 0.43	< 0.029	< 0.026	< 0.037	< 0.025	< 0.027	< 0.019
SW-20	05/23/2008	< 0.054	< 0.025	< 0.026	< 0.024	< 0.063	< 0.43	< 0.029	< 0.026	< 0.037	< 0.025	< 0.027	< 0.019
	09/21/2008	< 0.054	< 0.025	< 0.026	< 0.024	< 0.063	< 0.43	< 0.029	< 0.026	< 0.037	< 0.025	< 0.027	< 0.019
Upstream Concentation													
Maximum		**0.054**	**0.025**	**0.026**	**0.024**	**0.063**	**0.43**	**0.029**	**0.026**	**0.037**	**0.025**	**0.027**	**0.019**

Table 4.1-3
Upstream Surface Water Data - SVOCs
Sheep Gulch
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	4-Nitrophenol	Acenaphthene	Acenaphthylene	Anthracene	Azobenzene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Benzoic Acid	Benzyl alcohol
SW-8	05/23/2008	< 0.28	< 0.026	< 0.015	< 0.024	< 0.021	< 0.018	< 0.031	< 0.017	< 0.019	< 0.024	< 1.1 R	< 0.073
	09/20/2008	< 0.28	< 0.026	< 0.015	< 0.024	< 0.021	< 0.018	< 0.031	< 0.017	< 0.019	< 0.024	< 1.1 R	< 0.073
SW-20	05/23/2008	< 0.28	< 0.026	< 0.015	< 0.024	< 0.021	< 0.018	< 0.031	< 0.017	< 0.019	< 0.024	< 1.1 R	< 0.073
	09/21/2008	< 0.28	< 0.026	< 0.015	< 0.024	< 0.021	< 0.018	< 0.031	< 0.017	< 0.019	< 0.024	< 1.1 R	< 0.073
Upstream Concentation													
Maximum		**0.28**	**0.026**	**0.015**	**0.024**	**0.021**	**0.018**	**0.031**	**0.017**	**0.019**	**0.024**	**1.1**	**0.073**

Table 4.1-3
Upstream Surface Water Data - SVOCs
Sheep Gulch
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	Bis(2-chloroethoxy)methane	Bis(2-chloroethyl)ether	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
SW-8	05/23/2008	< 0.024	< 0.035	< 0.026	< 0.17	< 0.077	< 0.018	< 0.028	< 0.017	< 0.018	**0.029 J**	< 0.021	< 0.15
	09/20/2008	< 0.024	< 0.035	< 0.026	< 0.13	< 0.032	< 0.018	< 0.028	< 0.017	< 0.018	< 0.022	< 0.021	< 0.073
SW-20	05/23/2008	< 0.024	< 0.035	< 0.026	< 0.15	< 0.070	< 0.018	< 0.028	< 0.017	< 0.018	**0.032 J**	< 0.021	< 0.14
	09/21/2008	< 0.024	< 0.035	< 0.026	< 0.40	< 0.018	< 0.018	< 0.028	< 0.017	< 0.018	< 0.019	< 0.021	< 0.071
Upstream Concentation													
Maximum		**0.024**	**0.035**	**0.026**	**0.4**	**0.077**	**0.018**	**0.028**	**0.017**	**0.018**	**0.032**	**0.021**	**0.15**

Table 4.1-3
Upstream Surface Water Data - SVOCs
Sheep Gulch
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	Di-n-octyl phthalate	Fluoranthene	Fluorene	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-cd)pyrene	Isophorone	Naphthalene	Nitrobenzene	N-Nitrosodimethylamine
SW-8	05/23/2008	**0.056 J**	< 0.020	< 0.027	< 0.022	< 0.027 R	< 0.19 R	< 0.024 R	< 0.021	< 0.016	< 0.022	< 0.028	< 0.42
	09/20/2008	< 0.018	< 0.020	< 0.027	< 0.022	< 0.027 R	< 0.19 R	< 0.024 R	< 0.021	< 0.016	< 0.022	< 0.028	< 0.42
SW-20	05/23/2008	**0.048 J**	< 0.020	< 0.027	< 0.022	< 0.027 R	< 0.19 R	< 0.024 R	< 0.021	< 0.016	< 0.036	< 0.028	< 0.42
	09/21/2008	< 0.018	< 0.020	< 0.027	< 0.022	< 0.027 R	< 0.19 R	< 0.024 R	< 0.021	< 0.016	< 0.022	< 0.028	< 0.42
Upstream Concentation													
Maximum		**0.056**	**0.020**	**0.027**	**0.022**	**0.027**	**0.19**	**0.024**	**0.021**	**0.016**	**0.036**	**0.028**	**0.42**

Table 4.1-3
Upstream Surface Water Data - SVOCs
Sheep Gulch
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	N-Nitrosodi-n-propylamine	N-Nitrosodiphenylamine	o-Cresol	p-Cresol	Pentachlorophenol	Phenanthrene	Phenol	Pyrene	Pyridine
SW-8	05/23/2008	< 0.037	< 0.048	< 0.11	< 0.12	< 0.34	< 0.022	< 0.063	< 0.019	--
	09/20/2008	< 0.037	< 0.048	< 0.11	< 0.12	< 0.34	< 0.022	< 0.063	< 0.019	< 1.4 R
SW-20	05/23/2008	< 0.037	< 0.048	< 0.11	< 0.12	< 0.34	< 0.022	< 0.063	< 0.019	--
	09/21/2008	< 0.037	< 0.048	< 0.11	< 0.12	< 0.34	< 0.022	< 0.081	< 0.019	< 1.4 R
Upstream Concentation										
Maximum		**0.037**	**0.048**	**0.11**	**0.12**	**0.34**	**0.022**	**0.081**	**0.019**	**--**

Table 4.1-4
Upstream Surface Water Data - VOCs
Sheep Gulch
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloro-1-propene	1,1-Dichloroethane	1,1-Dichloroethylene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dibromo-3-chloropropane
SW-8	05/23/2008	< 0.047	< 0.050	< 0.064	< 0.061	< 0.051	< 0.042	< 0.10	< 0.10	< 0.14	< 0.13	< 0.037	< 0.22
	09/20/2008	< 0.047	< 0.050	< 0.064	< 0.061	< 0.051	< 0.042	< 0.10	< 0.10	< 0.14	< 0.13	< 0.037	< 0.22 J
SW-20	05/23/2008	< 0.047	< 0.050	< 0.064	< 0.061	< 0.051	< 0.042	< 0.10	< 0.10	< 0.14	< 0.13	< 0.037	< 0.22
	09/21/2008	< 0.047	< 0.050	< 0.064	< 0.061	< 0.051	< 0.042	< 0.10	< 0.10	< 0.14	< 0.13	< 0.037	< 0.22 J
Upstream Concentation													
Maximum		**0.047**	**0.050**	**0.064**	**0.061**	**0.051**	**0.042**	**0.10**	**0.10**	**0.14**	**0.13**	**0.037**	**0.22**

Table 4.1-4
Upstream Surface Water Data - VOCs
Sheep Gulch
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloroethylene, cis	1,2-Dichloroethylene, trans	1,2-Dichloropropane	1,3,5-Trimethylbenzene	1,3-Dichloro-1-propene trans	1,3-Dichloro-1-propene, cis	1,3-Dichlorobenzene	1,3-Dichloropropane	1,4-Dichlorobenzene	2,2-Dichloropropane	2-Chloroethyl Vinyl Ether
SW-8	05/23/2008	< 0.084	< 0.044	< 0.073	< 0.045	< 0.048	< 0.042	< 0.042	< 0.041	< 0.038	< 0.041	< 0.032	< 0.054	< 0.050	< 0.19 R
	09/20/2008	< 0.084	< 0.044	< 0.073	< 0.045	< 0.048	< 0.042	< 0.042	< 0.041	< 0.038	< 0.041	< 0.032	< 0.054	< 0.050	< 0.19 R
SW-20	05/23/2008	< 0.084	< 0.044	< 0.073	< 0.045	< 0.048	< 0.042	< 0.042	< 0.041	< 0.038	< 0.041	< 0.032	< 0.054	< 0.050	< 0.19 R
	09/21/2008	< 0.084	< 0.044	< 0.073	< 0.045	< 0.048	< 0.042	< 0.042	< 0.041	< 0.038	< 0.041	< 0.032	< 0.054	< 0.050	< 0.19 R
Upstream Concentation															
Maximum		**0.084**	**0.044**	**0.073**	**0.045**	**0.048**	**0.042**	**0.042**	**0.041**	**0.038**	**0.041**	**0.032**	**0.054**	**0.050**	**--**

Table 4.1-4
Upstream Surface Water Data - VOCs
Sheep Gulch
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	2-Hexanone	Acetone	Acrolein	Acrylonitrile	Benzene	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	Butyl benzene	Butylbenzene sec	Butylbenzene tert-	Carbon disulfide	Carbon tetrachloride	Chlorobenzene
SW-8	05/23/2008	< 2.9	< 2.5	< 2.0	< 0.31	< 0.045	< 0.027	< 0.091	< 0.036	< 0.080	< 0.072	< 0.056	< 0.036	< 0.038	**0.050 J**	< 0.068	< 0.045
	09/20/2008	< 2.9	< 2.5	< 2.0	< 0.31	< 0.045	< 0.027	< 0.091	< 0.036	< 0.080 J	< 0.072	< 0.056	< 0.036	< 0.038	< 0.045	< 0.068	< 0.045
SW-20	05/23/2008	< 2.9	< 2.5	< 2.0	< 0.31	< 0.045	< 0.027	< 0.091	< 0.036	< 0.080	< 0.072	< 0.056	< 0.036	< 0.038	< 0.045	< 0.068	< 0.045
	09/21/2008	< 2.9	< 2.5	< 2.0	< 0.31	< 0.045	< 0.027	< 0.091	< 0.036	< 0.080 J	< 0.072	< 0.056	< 0.036	< 0.038	< 0.045	< 0.068	< 0.045
Upstream Concentation																	
Maximum		**2.9**	**2.5**	**2.0**	**0.31**	**0.045**	**0.027**	**0.091**	**0.036**	**0.080**	**0.072**	**0.056**	**0.036**	**0.038**	**0.050**	**0.068**	**0.045**

Table 4.1-4
Upstream Surface Water Data - VOCs
Sheep Gulch
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	Chlorotoluene o-	Chlorotoluene p-	Cumene (isopropyl benzene)	Cymene p- (Toluene isopropyl p-)	Dibromomethane (methylene bromide)	Dichlorodifluoromethane (CFC-12)	Ethyl benzene	Hexachlorobutadiene	Iodomethane	Methyl ethyl ketone
SW-8	05/23/2008	< 0.057	< 0.13	< 0.042	< 0.053	< 0.035	< 0.025	< 0.031	< 0.044	< 0.089	< 0.083	< 0.042	< 0.19	< 0.27	< 3.8
	09/20/2008	< 0.057	< 0.13	< 0.042	< 0.053	< 0.035	< 0.025	< 0.031	< 0.044	< 0.089	< 0.083	< 0.042	< 0.19	< 0.27	< 3.8
SW-20	05/23/2008	< 0.057	< 0.13	< 0.042	< 0.053	< 0.035	< 0.025	< 0.031	< 0.044	< 0.089	< 0.083	< 0.042	< 0.19	< 0.27	< 3.8
	09/21/2008	< 0.057	< 0.13	< 0.042	< 0.053	< 0.035	< 0.025	< 0.031	< 0.044	< 0.089	< 0.083	< 0.042	< 0.19	< 0.27	< 3.8
Upstream Concentation															
Maximum		**0.057**	**0.13**	**0.042**	**0.053**	**0.035**	**0.025**	**0.031**	**0.044**	**0.089**	**0.083**	**0.042**	**0.19**	**0.27**	**3.8**

Table 4.1-4
Upstream Surface Water Data - VOCs
Sheep Gulch
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	Methyl isobutyl ketone	Methyl tertiary butyl ether (MTBE)	Methylene chloride	Naphthalene	Propylbenzene	Styrene	Tetrachloroethylene	Toluene	Trichloroethylene	Trichlorofluoromethane	Vinyl acetate	Vinyl chloride	Xylene, m & p	Xylene, o-
SW-8	05/23/2008	< 3.0	< 0.070	< 0.23	**0.77 J**	< 0.037	< 0.039	< 0.077	**0.080 J**	< 0.061	< 0.086	< 0.91	< 0.071	< 0.078	< 0.037
	09/20/2008	< 3.0	< 0.070	< 0.23	< 0.10	< 0.037	< 0.039	< 0.077	< 0.27	< 0.061	< 0.086	< 0.91	< 0.071	< 0.078	< 0.037
SW-20	05/23/2008	< 3.0	< 0.070	< 0.23	< 0.10	< 0.037	< 0.039	< 0.077	**0.050 J**	< 0.061	< 0.086	< 0.91	< 0.071	< 0.078	< 0.037
	09/21/2008	< 3.0	< 0.070	< 0.23	< 0.10	< 0.037	< 0.039	< 0.077	< 0.15	< 0.061	< 0.086	< 0.91	< 0.071	< 0.078	< 0.037
Upstream Concentation															
Maximum		**3.0**	**0.070**	**0.23**	**0.77**	**0.037**	**0.039**	**0.077**	**0.27**	**0.061**	**0.086**	**0.91**	**0.071**	**0.078**	**0.037**

Table 4.1-5
Upstream Surface Water Data - Radionuclides
Sheep Gulch
Rhodia Silver Bow Plant
[concentrations in pCi/l]

Location ID	Sample Date	Gross Alpha (radiation)	Gross Beta (radiation)	Radium 226	Radium 228
SW-8	05/23/2008	**2.1 +/- 1.8**	< 3.5	< 0.17	< 1.4
	09/20/2008	< 1.5	< 2.9	< 0.54	< 0.71
SW-20	05/23/2008	< 1.6	< 2.9	< 0.23	< 3.7
	09/21/2008	< 2	< 4.2	< 0.33	**1.1 +/- 0.27**
Upstream Concentation					
Maximum		**2.1**	**4.2**	**0.54**	**3.7**

Table 4.1-6
Upstream Surface Water Data - General and Site-Specific Parameters
Silver Bow Creek
Rhodia Silver Bow Plant
[concentrations in mg/l]

Location ID	Sample Date	Alkalinity, bicarbonate as CaCO3	Alkalinity, carbonate as CaCO3	Chloride	Fluoride	Nitrate + Nitrite	Nitrogen, ammonia as N	Phosphorus, elemental (white)	Phosphorus, total	Sulfate
SW-14	05/19/2008	**92**	< 2	**21.2**	**0.4**	**1.91**	**0.53**	< 0.0000234	**0.53**	**68.7**
	09/17/2008	**100**	< 2	**30.6**	**0.5**	**2.80**	**0.34**	< 0.0000234	**0.45**	**115**
Upstream Concentation										
Maximum		**100**	**2**	**30.6**	**0.5**	**2.80**	**0.53**	**0.0000234**	**0.53**	**115**

Table 4.1-7
Upstream Surface Water Data - Metals
Silver Bow Creek
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	Fraction	Antimony		Arsenic		Barium		Beryllium		Cadmium		Calcium		Chromium		Cobalt		Copper		Iron		Lead		Magnesium		Manganese	
SW-14	05/19/2008	Dissolved	**0.36**	--	**6.8**	--	**28.9**	--	< 0.02	--	**0.11**	--	**40400**	--	< 0.2	--	**0.34**	--	**15.2**	--	**134**	--	**0.36**	--	**9640**	--	**135**	--
		Total	--	**0.36**	--	**7.8**	--	**34.4**	--	< 0.02	--	**0.29**	--	**39000**	--	**0.4**	--	**0.38**	--	**25.2**	--	**609**	--	**2.24**	--	**9390**	--	**209**
	09/17/2008	Dissolved	**0.32**	--	**5.9**	--	**39.71**	--	< 0.02	--	**0.15**	--	**54800**	--	< 0.3	--	**0.36**	--	**9.4**	--	**20**	--	**0.14**	--	**12800**	--	**102.9**	--
		Total	--	**0.34**	--	**6.6**	--	**45.65**	--	< 0.02	--	**0.33**	--	**54900**	--	< 0.6	--	**0.42**	--	**19.3**	--	**330**	--	**2.22**	--	**12900**	--	**271.6**
Upstream Concentation																												
Maximum			**0.36**	**0.36**	**6.8**	**7.8**	**39.71**	**45.65**	**0.02**	**0.02**	**0.15**	**0.33**	**54800**	**54900**	**0.3**	**0.6**	**0.36**	**0.42**	**15.2**	**25.2**	**134**	**609**	**0.36**	**2.24**	**12800**	**12900**	**135**	**271.6**

Table 4.1-7
Upstream Surface Water Data - Metals
Silver Bow Creek
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	Fraction	Mercury		Nickel		Potassium		Selenium		Silver		Sodium		Thallium		Uranium		Vanadium		Zinc	
SW-14	05/19/2008	Dissolved	< 0.2	--	**1**	--	**5280**	--	< 1.0	--	< 0.02	--	**25000**	--	< 0.02	--	**3.5**	--	**2.5**	--	**24.4**	--
		Total	--	< 0.2	--	**1.1**	--	**5060**	--	< 1.0	--	**0.05**	--	**24000**	--	< 0.02	--	**3.5**	--	**3.0**	--	**56.1**
	09/17/2008	Dissolved	< 0.2	--	**2.4**	--	**5700**	--	< 1.0	--	< 0.02	--	**31200**	--	< 0.02	--	**5.53**	--	**2.2**	--	**40.5**	--
		Total	--	< 0.2	--	**2.2**	--	**5700**	--	< 1.0	--	**0.05**	--	**30900**	--	< 0.02	--	**5.84**	--	**2.8**	--	**77.5**
Upstream Concentation																						
Maximum			**0.2**	**0.2**	**2.4**	**2.2**	**5700**	**5700**	**1.0**	**1.0**	**0.02**	**0.05**	**31200**	**30900**	**0.02**	**0.02**	**5.53**	**5.84**	**2.5**	**3.0**	**40.5**	**77.5**

Table 4.1-8
Upstream Surface Water Data - SVOCs
Silver Bow Creek
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	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	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methyl-4,6-dinitrophenol
SW-14	05/19/2008	< 0.016	< 0.022	< 0.021	< 0.029	< 0.031	< 0.058	< 0.047	< 2.2	< 0.17	< 0.018	< 0.033	< 0.041	< 0.054	< 0.025
	09/17/2008	< 0.016	< 0.022	< 0.021	< 0.029	< 0.031	< 0.058	< 0.047	< 2.2	< 0.17 R	< 0.018	< 0.033	< 0.041	< 0.054	< 0.025 R
Upstream Concentation															
Maximum		**0.016**	**0.022**	**0.021**	**0.029**	**0.031**	**0.058**	**0.047**	**2.2**	**0.17**	**0.018**	**0.033**	**0.041**	**0.054**	**0.025**

Table 4.1-8
Upstream Surface Water Data - SVOCs
Silver Bow Creek
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	2-Methylnaphthalene	2-Nitroaniline	2-Nitrophenol	3,3`-Dichlorobenzidine	3-Nitroaniline	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenyl phenyl ether	4-Nitroaniline	4-Nitrophenol	Acenaphthene	Acenaphthylene	Anthracene	Azobenzene	Benzo(a) anthracene	Benzo(a) pyrene
SW-14	05/19/2008	< 0.026	< 0.024	< 0.063	< 0.43 R	< 0.029	< 0.026	< 0.037	< 0.025 R	< 0.027	< 0.019	< 0.28	< 0.026	< 0.015	< 0.024	< 0.021	< 0.018	< 0.031
	09/17/2008	< 0.026	< 0.024	< 0.063	< 0.43	< 0.029	< 0.026	< 0.037	< 0.025	< 0.027	< 0.019	< 0.28	< 0.0044	< 0.0034	< 0.0036	< 0.021	**0.0033 J**	< 0.0043
Upstream Concentation																		
Maximum		**0.026**	**0.024**	**0.063**	**0.43**	**0.029**	**0.026**	**0.037**	**0.025**	**0.027**	**0.019**	**0.28**	**0.026**	**0.015**	**0.024**	**0.021**	**0.018**	**0.031**

Table 4.1-8
Upstream Surface Water Data - SVOCs
Silver Bow Creek
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Benzoic acid	Benzyl alcohol	Bis(2-chloroethoxy) methane	Bis(2-chloroethyl) ether	Bis(2-chloroisopropyl) ether	Bis(2-ethylhexyl) phthalate	Butyl benzyl p hthalate	Carbazole	Chrysene	Dibenz(a,h) anthracene	Dibenzofuran	Diethyl phthalate	Dimethyl phthalate	Di-n-butyl phthalate	Di-n-octyl phthalate
SW-14	05/19/2008	< 0.017	< 0.019	< 0.024	< 1.1 R	< 0.073	< 0.024	< 0.035	< 0.026	< 0.43	< 0.085	< 0.018	< 0.028	< 0.017	< 0.018	< 0.040	< 0.021	< 0.076	< 0.018
	09/17/2008	< 0.0023	< 0.0029	< 0.0025	1.6 R	< 0.073	< 0.024	< 0.035	< 0.026	< 1.0	< 0.039	< 0.018	< 0.0034	< 0.0025	< 0.018	< 0.041	< 0.021	< 0.073	< 0.018
Upstream Concentation																			
Maximum		**0.017**	**0.019**	**0.024**	**--**	**0.073**	**0.024**	**0.035**	**0.026**	**1.0**	**0.085**	**0.018**	**0.028**	**0.017**	**0.018**	**0.041**	**0.021**	**0.076**	**0.018**

Table 4.1-8
Upstream Surface Water Data - SVOCs
Silver Bow Creek
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	Fluoranthene	Fluorene	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-cd) pyrene	Isophorone	Naphthalene	Nitrobenzene	N-Nitrosodimethylamine	N-Nitrosodi-n-propylamine	N-Nitrosodiphenylamine	o-Cresol
SW-14	05/19/2008	< 0.020	< 0.027	< 0.022	< 0.027 R	< 0.19 R	< 0.024	< 0.021	< 0.016	< 0.022	< 0.028	< 0.42	< 0.037	< 0.048	< 0.11
	09/17/2008	< 0.0044	< 0.0038	< 0.022	< 0.027 R	< 0.19 R	< 0.024 R	< 0.0026	< 0.016	< 0.016	< 0.028	< 0.42	< 0.037	< 0.048	< 0.11
Upstream Concentation															
Maximum		**0.020**	**0.027**	**0.022**	**--**	**--**	**0.024**	**0.021**	**0.016**	**0.022**	**0.028**	**0.42**	**0.037**	**0.048**	**0.11**

Table 4.1-8
Upstream Surface Water Data - SVOCs
Silver Bow Creek
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	p-Cresol	Pentachlorophenol	Phenanthrene	Phenol	Pyrene	Pyridine
SW-14	05/19/2008	< 0.12	< 0.34	< 0.022	< 0.072	**0.026 J**	--
	09/17/2008	< 0.12	< 0.34 R	**0.0064 J**	< 0.063	< 0.0035	< 1.4 R
Upstream Concentation							
Maximum		**0.12**	**0.34**	**0.022**	**0.072**	**0.026**	**--**

Table 4.1-9
Upstream Surface Water Data - VOCs
Silver Bow Creek
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloro-1-propene	1,1-Dichloroethane	1,1-Dichloroethylene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane	1,2-Dichlorobenzene
SW-14	05/19/2008	< 0.047	< 0.050	< 0.064	< 0.061	< 0.051	< 0.042	< 0.10	< 0.10	< 0.14	< 0.13	< 0.037	< 0.22	< 0.084	< 0.044
	09/17/2008	< 0.047	< 0.050	< 0.064	< 0.061	< 0.051	< 0.042	< 0.10	< 0.10	< 0.14	< 0.13	< 0.037	< 0.22	< 0.084	< 0.044
Upstream Concentation															
Maximum		**0.047**	**0.050**	**0.064**	**0.061**	**0.051**	**0.042**	**0.10**	**0.10**	**0.14**	**0.13**	**0.037**	**0.22**	**0.084**	**0.044**

Table 4.1-9
Upstream Surface Water Data - VOCs
Silver Bow Creek
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	1,2-Dichloroethane	1,2-Dichloroethylene, cis	1,2-Dichloroethylene, trans	1,2-Dichloropropane	1,3,5-Trimethylbenzene	1,3-Dichloro-1-propene trans	1,3-Dichloro-1-propene, cis	1,3-Dichlorobenzene	1,3-Dichloropropane	1,4-Dichlorobenzene	2,2-Dichloropropane	2-Chloroethyl Vinyl Ether	2-Hexanone	Acetone	Acrolein
SW-14	05/19/2008	< 0.073	< 0.045	< 0.048	< 0.042	< 0.042	< 0.041	< 0.038	< 0.041	< 0.032	< 0.054	< 0.050	< 0.19 R	< 2.9	**4.1 J**	< 2.0
	09/17/2008	< 0.073	< 0.045	< 0.048	< 0.042	< 0.042	< 0.041	< 0.038	< 0.041	< 0.032	< 0.054	< 0.050	< 0.19 R	< 2.9	< 7.0	< 2.0
Upstream Concentation																
Maximum		**0.073**	**0.045**	**0.048**	**0.042**	**0.042**	**0.041**	**0.038**	**0.041**	**0.032**	**0.054**	**0.050**	**--**	**2.9**	**7.0**	**2.0**

Table 4.1-9
Upstream Surface Water Data - VOCs
Silver Bow Creek
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	Acrylonitrile	Benzene	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	Butyl benzene	Butylbenzene sec	Butylbenzene tert-	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chlorodibromomethane	Chloroethane	Chloroform
SW-14	05/19/2008	< 0.31	< 0.045	< 0.027	< 0.091	< 0.036	< 0.080	< 0.072	< 0.056	< 0.036	< 0.038	< 0.070	< 0.068	< 0.045	< 0.057	< 0.13	**0.37 J**
	09/17/2008	< 0.31	< 0.045	< 0.027	< 0.091	< 0.036	< 0.080 J	< 0.072	< 0.056	< 0.036	< 0.038	< 0.060	< 0.068	< 0.045	< 0.057	< 0.13	< 0.12
Upstream Concentation																	
Maximum		**0.31**	**0.045**	**0.027**	**0.091**	**0.036**	**0.080**	**0.072**	**0.056**	**0.036**	**0.038**	**0.070**	**0.068**	**0.045**	**0.057**	**0.13**	**0.37**

Table 4.1-9
Upstream Surface Water Data - VOCs
Silver Bow Creek
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	Chloromethane	Chlorotoluene o-	Chlorotoluene p-	Cumene (isopropyl benzene)	Cymene p- (Toluene isopropyl p-)	Dibromomethane (methylene bromide)	Dichlorodifluoromethane (CFC-12)	Ethyl benzene	Hexachlorobutadiene	Iodomethane	Methyl ethyl ketone	Methyl isobutyl ketone	Methyl tertiary butyl ether (MTBE)	Methylene chloride
SW-14	05/19/2008	< 0.053	< 0.035	< 0.025	< 0.031	< 0.044	< 0.089	< 0.083	< 0.042	< 0.19	< 0.27	< 3.8	< 3.0	< 0.070	< 0.23
	09/17/2008	< 0.060	< 0.035	< 0.025	< 0.031	< 0.044	< 0.089	< 0.083	< 0.042	< 0.19	< 0.27	< 3.8	< 3.0	< 0.070	< 0.23
Upstream Concentation															
Maximum		**0.060**	**0.035**	**0.025**	**0.031**	**0.044**	**0.089**	**0.083**	**0.042**	**0.19**	**0.27**	**3.8**	**3.0**	**0.070**	**0.23**

Table 4.1-9
Upstream Surface Water Data - VOCs
Silver Bow Creek
Rhodia Silver Bow Plant
[concentrations in ug/l]

Location ID	Sample Date	Naphthalene	Propylbenzene	Styrene	Tetrachloroethylene	Toluene	Trichloroethylene	Trichlorofluoromethane	Vinyl acetate	Vinyl chloride	Xylene m & p	Xylene, o-
SW-14	05/19/2008	< 0.10	< 0.037	< 0.039	< 0.077	< 0.29	< 0.061	< 0.086	< 0.91	< 0.071	< 0.078	< 0.037
	09/17/2008	< 0.10	< 0.037	< 0.039	< 0.077	< 0.23	< 0.061	< 0.086	< 0.91	< 0.071	< 0.078	< 0.037
Upstream Concentation												
Maximum		**0.10**	**0.037**	**0.039**	**0.077**	**0.29**	**0.061**	**0.086**	**0.91**	**0.071**	**0.078**	**0.037**

Table 4.1-10
Upstream Surface Water Data - Radionuclides
Silver Bow Creek
Rhodia Silver Bow Plant
[concentrations in pCi/l]

Location ID	Sample Date	Gross Alpha (radiation)	Gross Beta (radiation)	Radium 226	Radium 228
SW-14	05/19/2008	**2.5 +/- 2**	**7.2 +/- 2.3**	< 0.14	< 0.74
	09/17/2008	**2.7 +/- 2**	**9.2 +/- 2.7**	< 0.34	< 0.71
Upstream Concentration					
Maximum		**2.7**	**9.2**	**0.34**	**0.74**

Figures

Barr Footer: ArcGIS 10.0, 2011-12-22 09:34 File: I:\Projects\26\46\006\Gis\Maps\RFI Workplan 2011\Response to EPA Comments November 2011\Figure 4 1-1 Surface Water Sample Locations.mxd User: sal2

SW-20 Surface Water Sample Location (2008)

ESI-SBC-1 Surface Water Sample Location (2003)

SW-SHPGLCH Surface Water Sample Location (1998)

SW-EPA-1 Surface Water Sample Location (1988)

Fence Line

Property Boundary

N

Feet

2,000 0 2,000

Figure 4.1-1

UPSTREAM SURFACE WATER SAMPLE LOCATIONS
Rhodia Silver Bow Plant
Montana