

Table 2-1. Percent Reduction in Baseflow from Existing Conditions in Partridge River

Mine Year	Total (Integrated) Percent Reductions in Baseflow (MODFLOW)			Incremental Percent Reductions in Baseflow (MODFLOW)	
	SW-002	SW-003	SW-004	SW-002 to SW-003	SW-003 to SW-004
Existing Conditions	--	--	--	--	--
Mine Year 1	3.7%	2.9%	1.0%	1.9%	-0.9%
Mine Year 5	7.7%	5.7%	3.6%	3.3%	1.4%
Mine Year 10	12.6%	9.1%	6.3%	4.8%	3.3%
Mine Year 15	13.9%	8.7%	5.4%	2.3%	2.0%
Mine Year 20	21.8%	15.4%	10.4%	7.5%	5.1%
Closure	21.8%	15.4%	10.4%	7.5%	5.1%
Post-Closure	20.1%	12.5%	7.6%	3.1%	2.5%

Condition	Baseflow (cfs)						
	SW-001	SW-002	SW-003	SW-004	SW-004a	SW-005	USGS Gage
Existing Conditions	0.18	0.56	0.67	0.99	2.38	4.65	5.12
Mine Year 1	0.18	0.54	0.65	0.97	2.36	4.63	5.10
Mine Year 5	0.18	0.52	0.62	0.94	2.33	4.60	5.07
Mine Year 10	0.18	0.49	0.59	0.90	2.29	4.56	5.03
Mine Year 15	0.18	0.48	0.59	0.90	2.29	4.56	5.03
Mine Year 20	0.18	0.44	0.54	0.84	2.22	4.49	4.96
Closure	0.18	0.44	0.54	0.84	2.22	4.49	4.96
Post-Closure	0.18	0.45	0.55	0.87	2.25	4.52	4.99

Condition	Baseflow Reduction (cfs)						
	SW-001	SW-002	SW-003	SW-004	SW-004a	SW-005	USGS Gage
Mine Year 1	0.000	-0.021	-0.023	-0.020	-0.018	-0.018	-0.018
Mine Year 5	0.000	-0.043	-0.047	-0.051	-0.053	-0.053	-0.053
Mine Year 10	0.000	-0.071	-0.076	-0.086	-0.092	-0.092	-0.092
Mine Year 15	0.000	-0.078	-0.080	-0.087	-0.090	-0.090	-0.090
Mine Year 20	0.000	-0.122	-0.130	-0.147	-0.155	-0.155	-0.155
Closure	0.000	-0.122	-0.130	-0.147	-0.155	-0.155	-0.155
Post-Closure	0.000	-0.112	-0.116	-0.124	-0.128	-0.128	-0.128

Condition	Percent Reduction of Baseflow						
	SW-001	SW-002	SW-003	SW-004	SW-004a	SW-005	USGS Gage
Mine Year 1	0.00%	3.69%	3.40%	2.01%	0.77%	0.39%	0.36%
Mine Year 5	0.00%	7.66%	6.94%	5.15%	2.25%	1.15%	1.04%
Mine Year 10	0.00%	12.61%	11.33%	8.72%	3.87%	1.98%	1.80%
Mine Year 15	0.00%	13.87%	11.97%	8.75%	3.79%	1.94%	1.76%
Mine Year 20	0.00%	21.82%	19.47%	14.81%	6.53%	3.34%	3.04%
Closure	0.00%	21.82%	19.47%	14.81%	6.53%	3.34%	3.04%
Post-Closure	0.00%	20.08%	17.30%	12.50%	5.38%	2.76%	2.50%

Table 2-2. Average 30-Day Low Flow in Partridge River Estimated by XP-SWMM and MODFLOW

Mine Year	Low Flow in Partridge River by Surface Water Monitoring Location ¹							
	SW-001	SW-002	SW-003	SW-004	SW-004a	SW-005	USGS Gage	Colby Lake
Existing Conditions	0.18	0.56	0.67	0.99	2.38	4.65	5.12	6.71
Mine Year 1	0.18	0.54	0.65	0.97	2.36	4.63	5.10	6.27
Mine Year 5	0.18	0.52	0.62	0.94	2.33	4.60	5.07	6.24
Mine Year 10	0.18	0.49	0.59	0.90	2.29	4.56	5.03	6.20
Mine Year 15	0.18	0.48	0.59	0.90	2.29	4.56	5.03	6.20
Mine Year 20	0.18	0.44	0.54	0.84	2.22	4.49	4.96	6.13
Closure	0.18	0.44	0.54	0.84	2.22	4.49	4.96	6.13
Post-Closure	0.18	0.45	0.55	0.87	2.25	4.52	4.99	6.16

¹ Flows include surface runoff and groundwater not originating from mine facilities

Table 2-3. Mean Annual Flow in Partridge River Estimated by XP-SWMM

Mine Year	Mean Annual Flow by Surface Water Monitoring Location in Partridge River ¹							
	SW-001	SW-002	SW-003	SW-004	SW-004a	SW-005	USGS Gage	Colby Lake
Existing Conditions	4.7	10.7	12.4	19.3	44.9	83.3	87.7	112.4
Mine Year 1	4.7	10.4	12.1	18.3	43.6	82.0	86.4	111.1
Mine Year 5	4.7	10.3	12.0	18.2	43.1	81.5	85.8	110.5
Mine Year 10	4.7	10.3	11.9	18.0	42.6	81.0	85.4	110.1
Mine Year 15	4.7	10.3	11.9	17.9	42.5	80.9	85.2	109.9
Mine Year 20	4.7	10.3	11.9	17.9	42.5	80.9	85.2	110.0
Closure	4.7	10.1	11.7	18.1	42.3	80.7	85.0	109.8
Post-Closure	4.7	10.4	12.1	18.6	46.1	84.4	88.8	113.5

¹ Flows include surface runoff and groundwater not originating from mine facilities

Table 2-4. Maximum 24-Hour Average Flow in the Partridge River Based on 10-Yr., 24-Hr. Precipitation Event, Estimated by XP-SWMM

Mine Year	Average High Flow in Partridge River by Surface Water Monitoring Location ¹							
	SW-001	SW-002	SW-003	SW-004	SW-004a	SW-005	USGS Gage	Colby Lake
Existing Conditions	84	178	235	303	968	1,114	1,114	1,451
Mine Year 1	84	173	230	289	940	1,097	1,098	1,435
Mine Year 5	84	172	228	286	928	1,089	1,090	1,428
Mine Year 10	84	171	227	283	919	1,084	1,085	1,422
Mine Year 15	84	171	227	282	915	1,081	1,083	1,420
Mine Year 20	84	171	227	282	916	1,082	1,083	1,420
Closure	84	168	223	285	911	1,079	1,081	1,418
Post-Closure	84	173	231	293	992	1,129	1,128	1,465

¹ Flows include surface runoff and groundwater not originating from mine facilities

Table 2-5. Discharges in Partridge River Watershed, Based on MPCA Records

Locations

MN0046981-SD-10
MN0046981-SD-16
MN0046981-SD-7
MN0046981-SD-9

NORTHSHORE MINING CO - PETER MITCHELL: 360S PIT DEWATERING PIPE OUTFALL 110
NORTHSHORE MINING CO - PETER MITCHELL: 33080 FILTERBACKWASH, INT SEEP & NC COOL
NORTHSHORE MINING CO - PETER MITCHELL: 223S PIT DEWATERING OUTFALL 107
NORTHSHORE MINING CO - PETER MITCHELL: 280/292S PIT DEWATERING OUTFALL 109

	MN0046981-SD-10					MN0046981-SD-16			MN0046981-SD-7			MN0046981-SD-9		
	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow
	MG	mgd	mgd	mgd	mgd	mgd	mgd	mgd	MG	mgd	mgd	mgd	mgd	mgd
	CalMoTot	CalMoAvg	CalMoMax	CalMoTot	DailyMax	CalMoAvg	CalMoMax	CalMoTot	CalMoTot	CalMoAvg	CalMoMax	CalMoAvg	CalMoTot	DailyMax
Max Daily Flow (mgd)					0.72		0.036				21.9			0.72
Jan-99														
Feb-99														
Mar-99														
Apr-99														
May-99														
Jun-99														
Jul-99		0.288		8.93	0.432	0.035	0.035	1.116						
Aug-99		0.162		5.02	0.216	0.0072	0.0072	0.223						
Sep-99						0.00061	0.00061	0.0183				0.504	15.12	0.72
Oct-99		0.288		8.928	0.288	0.0072	0.0072	0.223						
Nov-99		0.126		3.78	0.144									
Dec-99		0.0432		1.339	0.0432									
Jan-00		0.036		1.116	0.0432									
Feb-00		0.026		0.754	0.026									
Mar-00		0.036		1.116	0.036									
Apr-00		0.144		4.32	0.144									
May-00		0.11		3.41	0.144									
Jun-00		0.13		3.9	0.216									
Jul-00		0.288		8.92	0.288									
Aug-00		0.288		8.93	0.288									
Sep-00		0.36		10.8	0.432	0.036	0.036	1.08						
Oct-00		0.288		8.9	0.288									
Nov-00		0.432		12.96	0.432	0.0144	0.0144	0.432						
Dec-00		0.054		1.674	0.072									
Jan-01		0.144		4.46	0.144									
Feb-01		0.072		2.016	0.072									
Mar-01		0.072		2.23	0.072									
Apr-01		0.18		5.4	0.216									
May-01		0.72		22.3	0.72									
Jun-01		0.504		15.12	0.576									
Jul-01	7.81	0.252			0.288									
Aug-01	10.04	0.324			0.36									
Sep-01	10.8	0.36			0.36									
Oct-01	8.928	0.288			0.288									
Nov-01	8.64	0.288			0.288									
Dec-01	13.39	0.432			0.432									
Jan-02	6.69	0.216			0.216									
Feb-02	3.024	0.108			0.144									
Mar-02	2.23	0.072			0.072									
Apr-02	5.4	0.18			0.22									
May-02	6.7	0.216			0.216									
Jun-02	0.216	0.216			0.216									
Jul-02	6.696	0.216		0.216										
Aug-02	241.2	7.78		7.78										
Sep-02	3.3	1.1		1.1										
Oct-02	13.2	0.425		0.72										
Nov-02	9.3	0.31		0.432										
Dec-02	15.2	0.49		0.69										
Jan-03	1.7856	0.0576	0.072											
Feb-03	0.5	0.018	0.036											
Mar-03	0.354	0.011	0.023											
Apr-03	0.432	0.014	0.014											
May-03	0.446	0.014	0.014											
Jun-03	0.21	0.007	0.014											
Jul-03	0.36	0.011	0.014											
Aug-03	0.434	0.014	0.014											
Sep-03	0.09	0.003	0.003											
Oct-03	3	0.1	0.1											
Nov-03	0.45	0.015	0.016						411	14.6	14.6			
Dec-03	0.22	0.007	0.007						406.8	14.6	14.6			
Jan-04	0.13	0.004	0.004						437.2	21.9	21.9			
Feb-04	0.21	0.007	0.007						284.2	21.9	21.9			
Mar-04	0.33	0.01	0.014						68.8	21.9	21.9			
Apr-04	34.1	1.1	1.5						180	21.9	21.9			
May-04	62	2	2.7						87.4	14.6	14.6			
Jun-04	48	1.6	2											
Jul-04	0.25	0.006	0.011						41.95	14.6	14.6			
Aug-04														
Sep-04	0.32	0.011	0.022											
Oct-04	0.54	0.017	0.017											
Nov-04														
Dec-04	0.33	0.0108	0.0144											
Jan-05														
Feb-05														
Mar-05														
Apr-05	2.69	0.89	0.107											
May-05	11.5	0.52	0.94											
Jun-05	49.5	1.6	2.3											
Jul-05	2.9	0.094	0.131											
Aug-05	0.01	<0.001	0.001											
Sep-05														
Oct-05														
Nov-05	4.1	0.11	0.17											
Dec-05	6.7	0.22	0.22											

Table 2-6. Average Baseline Water Quality Data Sampled at PM-1 (SW-001)

Parameter		Units	Concentration at PM-1 (SW-001)
Ag	Silver	mg/L	0.00012
Al	Aluminum	mg/L	0.0173
As	Arsenic	mg/L	0.0065
B	Boron	mg/L	0.096
Ba	Barium	mg/L	0.005
Be	Beryllium	mg/L	0.0001
Ca	Calcium	mg/L	24.5
Cd	Cadmium	mg/L	0.0001
Cl	Chloride	mg/L	1.6
Co	Cobalt	mg/L	0.0005
Cu	Copper	mg/L	0.00124
F	Fluoride	mg/L	0.14
Fe	Iron	mg/L	0.03
Hardness		mg/L	110
K	Potassium	mg/L	2.7
Mg	Magnesium	mg/L	10.5
Mn	Manganese	mg/L	0.0086
Na	Sodium	mg/L	4.8
Ni	Nickel	mg/L	0.00155
Pb	Lead	mg/L	0.00015
Sb ¹	Antimony	mg/L	0.0015
Se	Selenium	mg/L	0.0005
SO ₄	Sulfate	mg/L	22
Tl	Thallium	mg/L	0.000286
V ¹	Vanadium	mg/L	0.0043
Zn	Zinc	mg/L	0.00733

¹ Sb and V were not monitored at PM-1, hence groundwater value is assumed

Table 2-7. Characteristic Water Quality for Hoyt Lakes WWTP - Selected Parameters

Parameter	Units	Concentration in Hoyt Lakes WWTP Effluent
Copper	mg/L	0.019
Nickel	mg/L	0.0033
Zinc	mg/L	0.062

Table 3-1. Comparison of Minnesota Surface Water Quality Standards

Water Body		Partridge River				Colby Lake			
Water Use Classification		2B - Statewide Waters	2B - Lake Superior Basin Waters	3C - Statewide Waters	4A - Statewide Waters	1B - Statewide Waters	2Bd - Statewide Waters	2Bd - Lake Superior Basin Waters	3C - Statewide Waters
Parameter	Units								
Ag	mg/L	0.001				(0.1)	0.001		
Al	mg/L	0.125				(0.2)	0.125		
As	mg/L	0.053	0.148			0.01	0.02	0.148	
B	mg/L				0.5				
Ba	mg/L					2			
Be	mg/L					0.004			
Ca	mg/L								
Cd	mg/L	0.0011 +	0.0025 *			0.005	0.0011 +	0.0025 *	
Cl	mg/L	230		250		(250)	230		250
Co	mg/L	0.005					0.0028		
Cu	mg/L	0.0098 +	0.0093 *			1.3 (1.0)	0.0098 +	0.0093 *	
F	mg/L					4 (2.0)			
Fe	mg/L					(0.3)			
Hardness	mg/L			500					500
K	mg/L								
Mg	mg/L								
Mn	mg/L								
Na	mg/L								
Ni	mg/L	0.158 +	0.052 *				0.158 +	0.052 *	
Pb	mg/L	0.0032 +				0.015	0.0032 +		
Sb	mg/L	0.031				0.006	0.0055		
Se	mg/L	0.005	0.005			0.05	0.005	0.005	
SO ₄	mg/L					(250)			
Tl	mg/L	0.00056				0.0005	0.00028		
V	mg/L								
Zn	mg/L	0.106 +	0.12 *			(5)	0.106 +	0.12 *	

Standards in bold are the most stringent and are used to evaluate the water quality modeling results of the NorthMet Project.

Minnesota Class 4B, 5 and 6 Surface Water Quality are applicable for the Partridge River and do not have standards related to the parameters listed above.

+ Standards assume a total hardness of 100 mg/L for Class 2B and 2Bd under Minnesota Rules Chapter 7050 for all statewide water bodies. Actual equations are:

$$\text{Cd standard} = \exp(0.7852 * \text{Ln}(\text{total hardness}) - 3.490) / 1000$$

$$\text{Cu standard} = \exp(0.62 * \text{Ln}(\text{total hardness}) - 0.57) / 1000$$

$$\text{Ni standard} = \exp(0.846 * \text{Ln}(\text{total hardness}) + 1.1645) / 1000$$

$$\text{Pb standard} = \exp(1.273 * \text{Ln}(\text{total hardness}) - 4.705) / 1000$$

$$\text{Zn standard} = \exp(0.8473 * \text{Ln}(\text{total hardness}) + 0.7615) / 1000$$

* Standards assume a total hardness of 100 mg/L for Class 2B and 2Bd under Minnesota Rules Chapter 7052 for Lake Superior Basin water bodies. Actual equations are:

$$\text{Cd standard} = \exp(0.7852 * \text{Ln}(\text{total hardness}) - 2.715) / 1000$$

$$\text{Cu standard} = \exp(0.8545 * \text{Ln}(\text{total hardness}) - 1.702) / 1000$$

$$\text{Ni standard} = \exp(0.846 * \text{Ln}(\text{total hardness}) + 0.0584) / 1000$$

$$\text{Zn standard} = \exp(0.8473 * \text{Ln}(\text{total hardness}) + 0.884) / 1000$$

() Numbers in parentheses indicate Secondary Maximum Contamination Level

Table 3-2. Groundwater Quality Standards (concentrations in µg/L)

		GW Standards		EPA sMCL
		EPA	MDH	
		MCL	HRL	
Antimony	µg/L	6	6	--
Arsenic	µg/L	10	--	--
Barium	µg/L	2,000	2,000	--
Beryllium	µg/L	4	0.08	--
Boron	µg/L	--	600	--
Cadmium	µg/L	5	4	--
Calcium		--	--	--
Chromium, total	µg/L	100	--	--
Chromium Hexavalent	µg/L	--	100	--
Chromium Trivalent	µg/L	--	20,000	--
Cobalt	µg/L	--	--	--
Copper	µg/L	1,300	--	1,000
Iron	µg/L	--	--	300
Lead (TT)	µg/L	15	--	--
Magnesium		--	--	--
Manganese	µg/L	--	100*	50
Mercury	µg/L	2	--	--
Nickel	µg/L	--	100	--
Selenium	µg/L	50	30	--
Silver	µg/L	--	30	100
Thallium	µg/L	2	0.6	--
Tin	µg/L	--	4,000	--
Vanadium	µg/L	--	50	--
Zinc	µg/L	--	2,000	5,000
Other Parameters				
Sulfate	µg/L	--	--	250,000
Alkalinity		--	--	--
Chloride	µg/L	--	--	250,000
Fluoride	µg/L	4,000	--	2,000
Hardness		--	--	--
Potassium		--	--	--
Sodium		--	--	--
Nitrogen as nitrate	µg/L	10,000	10,000	--
Nitrogen as ammonia		--	--	--
Aluminum	µg/L		--	50 to 200
Molybdenum	µg/L	--	--	--

Groundwater Criteria:

sMCL - Secondary MCLs (40 CFR 143) based on aesthetics.

MCL - Maximum Contaminant Levels (40 CFR 141)

HRLs - Health Risk Limits - (MN Rules 4717.7500)

* While a HRL was promulgated for this chemical, due to research that has become available since the HRLs were promulgated, the MDH no longer recommends the HRL value.

Table 4-1. High, Average and Low Estimates of Liner Yield for Different Stockpiles and Conditions Under Mine Site-Proposed Action

Stockpile	Condition	Liner Yield (inches/year)		
		High	Average	Low
Category 1/2 Waste Rock and Overburden	Active	20.4	14.2	8.2
	Reclaimed with soil-ET cover	14.7	10.2	4.7
Category 3 Waste Rock	Active	20.4	14.2	8.2
	Reclaimed with soil-ET cover	14.7	10.2	4.7
	Reclaimed with geomembrane cover	1.5	0.3	0.1
Category 3 Lean Ore	Active	20.4	14.2	8.2
	Reclaimed with soil-ET cover	14.7	10.2	4.7
	Reclaimed with geomembrane cover	1.5	0.3	0.1
Category 4 Waste Rock	Active	20.4	14.2	8.2
	Reclaimed with geomembrane cover	1.5	0.3	0.1
Lean Ore Surge Pile	Active	20.4	14.2	8.2

Table 4-2. Ranges of Conditions for HELP Modeling of Low, Average and High Liner Leakage Rates for Different Stockpiles and Conditions Under Mine Site-Proposed Action

Stockpile	Condition	Parameter	Liner Leakage Rate		
			High	Average	Low
Category 1/2 Waste Rock and Overburden	Active	Parameters	Range of slope of overliner in liner system	0.20%	0.2% - 0.5%
			Range of permeability of soil liner in liner system (cm/s)	5.00E-06	1.00E-07 - 5.00E-06
			Liner yield (inches/year)	20.4	8.2
	Reclaimed with soil-ET cover	Results	Range of Liner Leakage Rate (gallons/acre/day)	1,496	89 - 606
			Range of slope of overliner in liner system	0.20%	0.2% - 0.5%
			Range of permeability of soil liner in liner system (cm/s)	5.00E-06	1.00E-07 - 5.00E-06
Category 3 Waste Rock	Active	Parameters	Liner yield (inches/year)	14.7	4.7
			Range of Liner Leakage Rate (gallons/acre/day)	1,088	84 - 352
			Range of slope of overliner in liner system	0.50%	0.50% - 2.00%
	Reclaimed with soil-ET cover	Parameters	Range in permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-07 - 1.00E-05
			Range in number of geomembrane installation defects per acre	8	1 - 4
			Liner yield (inches/year)	20.4	8.2
	Reclaimed with geomembrane	Results	Range of Liner Leakage Rate (gallons/acre/day)	2,5443	0.0030 - 1.8301
			Range of slope of overliner in liner system	0.50%	0.50% - 2.00%
			Range in permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-07 - 1.00E-05
	Reclaimed with geomembrane	Parameters	Range in number of geomembrane installation defects per acre	8	1 - 8
			Liner yield (inches/year)	14.7	10.2
			Range of Liner Leakage Rate (gallons/acre/day)	1,8896	0.0022 - 1.3614
Category 3 Lean Ore	Active	Parameters	Range of slope of overliner in liner system	0.50%	0.50% - 2.00%
			Range in permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-07 - 1.00E-05
			Range in number of geomembrane installation defects per acre	8	1 - 8
	Reclaimed with soil-ET cover	Parameters	Liner yield (inches/year)	20.4	14.2
			Range of Liner Leakage Rate (gallons/acre/day)	2,5443	0.0030 - 1.8301
			Range of slope of overliner in liner system	0.50%	0.50% - 2.00%
	Reclaimed with geomembrane	Parameters	Range in permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-07 - 1.00E-05
			Range in number of geomembrane installation defects per acre	8	1 - 8
			Liner yield (inches/year)	14.7	10.2
	Reclaimed with geomembrane	Results	Range of Liner Leakage Rate (gallons/acre/day)	1,8896	0.0022 - 1.3614
			Range of slope of overliner in liner system	0.50%	0.50% - 2.00%
			Range in permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-07 - 1.00E-05
Category 4 Waste Rock	Active	Parameters	Range in number of geomembrane installation defects per acre	8	1 - 8
			Liner yield (inches/year)	20.4	14.2
			Range of Liner Leakage Rate (gallons/acre/day)	2,5443	0.0030 - 1.8301
	Reclaimed with soil-ET cover	Parameters	Range of slope of overliner in liner system	0.50%	0.50% - 2.00%
			Range in permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-07 - 1.00E-05
			Range in number of geomembrane installation defects per acre	8	1 - 8
	Reclaimed with geomembrane	Parameters	Liner yield (inches/year)	14.7	10.2
			Range of Liner Leakage Rate (gallons/acre/day)	1,8896	0.0022 - 1.3614
			Range of slope of overliner in liner system	0.50%	0.50% - 2.00%
	Reclaimed with geomembrane	Results	Range in permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-07 - 1.00E-05
			Range in number of geomembrane installation defects per acre	8	1 - 8
			Liner yield (inches/year)	14.7	10.2
Lean Ore Surge Pile	Active	Parameters	Range of Liner Leakage Rate (gallons/acre/day)	0.2358	0.0007 - 0.0588
			Range of slope of overliner in liner system	0.50%	0.50% - 2.00%
			Range in permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-07 - 1.00E-05
	Reclaimed with soil-ET cover	Parameters	Range in number of geomembrane installation defects per acre	8	1 - 8
			Liner yield (inches/year)	20.4	14.2
			Range of Liner Leakage Rate (gallons/acre/day)	2,5443	0.0030 - 1.8301

Table 4-3. Conditions for and Results of Modeling of Low, Average and High Liner Leakage Rates for Different Stockpiles and Conditions Under Mine Site-Proposed Action

Stockpile	Condition	Parameter	Liner Leakage Rate		
			High	Average	Low
Category 1/2 Waste Rock and Overburden	Active	Parameters	Slope of overliner in liner system	0.20%	0.50%
			Permeability of soil liner in liner system (cm/s)	5.00E-06	5.00E-07
			Liner yield (inches/year)	20.4	8.2
	Reclaimed with soil-ET cover	Result	Liner Leakage Rate (gallons/acre/day)	1,496	377
			Slope of overliner in liner system	0.20%	0.50%
			Permeability of soil liner in liner system (cm/s)	5.00E-06	5.00E-07
Category 3 Waste Rock	Active	Parameters	Liner yield (inches/year)	14.7	4.7
			Liner Leakage Rate (gallons/acre/day)	1,088	297
			Slope of overliner in liner system	0.50%	1.00%
	Reclaimed with soil-ET cover	Parameters	Permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-05
			Number of geomembrane installation defects per acre	8	4
			Liner yield (inches/year)	14.7	4.7
	Reclaimed with geomembrane	Result	Liner Leakage Rate (gallons/acre/day)	1,8896	0.1800
			Slope of overliner in liner system	0.50%	1.00%
			Permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-05
		Parameters	Number of geomembrane installation defects per acre	8	4
			Liner yield (inches/year)	1.5	0.1
			Liner Leakage Rate (gallons/acre/day)	0.2358	0.0588
Category 3 Lean Ore	Active	Parameters	Slope of overliner in liner system	0.50%	1.00%
			Permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-06
			Number of geomembrane installation defects per acre	8	4
	Reclaimed with soil-ET cover	Parameters	Liner yield (inches/year)	20.4	8.2
			Liner Leakage Rate (gallons/acre/day)	2,5443	0.0551
			Slope of overliner in liner system	0.50%	1.00%
	Reclaimed with geomembrane	Parameters	Permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-06
			Number of geomembrane installation defects per acre	8	4
			Liner yield (inches/year)	1.5	0.1
		Result	Liner Leakage Rate (gallons/acre/day)	0.2358	0.0112
			Slope of overliner in liner system	0.50%	1.00%
			Permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-06
Category 4 Waste Rock	Active	Parameters	Number of geomembrane installation defects per acre	8	4
			Liner yield (inches/year)	20.4	8.2
			Liner Leakage Rate (gallons/acre/day)	2,5443	0.0551
	Reclaimed with geomembrane	Parameters	Slope of overliner in liner system	0.50%	1.00%
			Permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-06
			Number of geomembrane installation defects per acre	8	4
Lean Ore Surge Pile	Active	Parameters	Liner yield (inches/year)	1.5	0.1
			Liner Leakage Rate (gallons/acre/day)	0.2358	0.0112
			Slope of overliner in liner system	0.50%	1.00%
		Result	Permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-06
			Number of geomembrane installation defects per acre	8	4
			Liner yield (inches/year)	20.4	8.2

Table 4-4. Stockpile Active and Reclaimed Areas under Proposed Action

Stockpile	Stage	Area Active (acres)	Area Reclaimed			Total Area (acres)
			Side Slopes (acres)	Top & Bench (acres)	Total Reclaimed (acres)	
Category 1/2 Waste Rock	Year 1	89.1			20.9	110.1
	Year 5	266.4			94.8	361.2
	Year 10	237.0			222.4	459.4
	Year 15	0.0			464.4	464.4
	Year 20	0.0			464.4	464.4
	Closure	0.0			464.4	464.4
	Post-Closure	0.0			464.4	464.4
Category 1/2 (Overburden Areas)	Year 1	58.4			4.5	63.0
	Year 5	95.2			29.6	124.8
	Year 10	47.6			56.8	104.4
	Year 15	0.0			99.4	99.4
	Year 20	0.0			99.4	99.4
	Closure	0.0			99.4	99.4
	Post-Closure	0.0			99.4	99.4
Category 3 Waste Rock	Year 1	5.9	0.0	0.0	0.0	5.9
	Year 5	21.8	3.9	0.0	3.9	25.6
	Year 10	36.6	9.6	0.7	10.3	46.9
	Year 15	46.9	22.9	2.2	25.1	72.0
	Year 20	0.0	51.3	20.7	72.0	72.0
	Closure	0.0	51.3	20.7	72.0	72.0
	Post-Closure	0.0	51.3	20.7	72.0	72.0
Category 3 Lean Ore	Year 1	35.4	0.0	0.0	0.0	35.4
	Year 5	54.5	9.3	0.0	9.3	63.9
	Year 10	67.6	26.2	3.9	30.1	97.7
	Year 15	79.2	65.3	12.3	77.7	156.8
	Year 20	0.0	115.6	41.3	156.8	156.8
	Closure	0.0	115.6	41.3	156.8	156.8
	Post-Closure	0.0	115.6	41.3	156.8	156.8
Category 4 Waste Rock	Year 1	4.5			0.0	4.5
	Year 5	35.6			4.4	40.0
	Year 10	39.8			23.6	63.3
	Year 15	35.7			27.6	63.3
	Year 20	0.0			63.3	63.3
	Closure	0.0			63.3	63.3
	Post-Closure	0.0			63.3	63.3
Lean Ore Surge Pile (removed at the end of Year 20)	Year 1	54.5			0.0	54.5
	Year 5	54.5			0.0	54.5
	Year 10	54.5			0.0	54.5
	Year 15	54.5			0.0	54.5
	Year 20	54.5			0.0	54.5

Table 4-5. Area Weighted Liner Yields under Mine Site-Proposed Action

Stockpile	Area-Weighted Low Liner Yield (inches/year)						
	Year 1	Year 5	Year 10	Year 15	Year 20	Closure	Post-Closure
Category 1/2 Waste Rock	7.7	7.3	6.5	4.7	4.7	4.7	4.7
Category 1/2 (Overburden Areas)	7.9	7.4	6.3	4.7	4.7	4.7	4.7
Category 3 Waste Rock	8.2	7.7	7.4	6.8	3.4	3.4	3.4
Category 3 Lean Ore	8.2	7.7	6.9	6.1	3.5	3.5	3.5
Category 4 Waste Rock	8.2	7.3	5.2	4.7	0.1	0.1	0.1
Lean Ore Surge Pile	8.2	8.2	8.2	8.2	8.2	--	--

Stockpile	Area-Weighted Average Liner Yield (inches/year)						
	Year 1	Year 5	Year 10	Year 15	Year 20	Closure	Post-Closure
Category 1/2 Waste Rock	13.6	13.2	12.2	10.2	10.2	10.2	10.2
Category 1/2 (Overburden Areas)	13.9	13.3	12.0	10.2	10.2	10.2	10.2
Category 3 Waste Rock	14.2	13.6	13.2	12.5	7.4	7.4	7.4
Category 3 Lean Ore	14.2	13.6	12.6	11.4	7.6	7.6	7.6
Category 4 Waste Rock	14.2	12.7	9.0	8.1	0.3	0.3	0.3
Lean Ore Surge Pile	14.2	14.2	14.2	14.2	14.2	--	--

Stockpile	Area-Weighted High Liner Yield (inches/year)						
	Year 1	Year 5	Year 10	Year 15	Year 20	Closure	Post-Closure
Category 1/2 Waste Rock	19.6	18.9	17.6	14.7	14.7	14.7	14.7
Category 1/2 (Overburden Areas)	20.0	19.0	17.3	14.7	14.7	14.7	14.7
Category 3 Waste Rock	20.4	19.5	19.0	18.0	10.9	10.9	10.9
Category 3 Lean Ore	20.4	19.6	18.1	16.5	11.2	11.2	11.2
Category 4 Waste Rock	20.4	18.3	13.4	12.2	1.5	1.5	1.5
Lean Ore Surge Pile	20.4	20.4	20.4	20.4	20.4	--	--

Table 4-6. Stockpile Liner Leakage Rates under Proposed Action

Stockpile	Low Liner Leakage Rate under Proposed Action (gpm)						
	Year 1	Year 5	Year 10	Year 15	Year 20	Closure	Post-Closure
Category 1/2 Waste Rock	43.9	120.3	132.0	116.2	116.2	116.2	116.2
Category 1/2 (Overburden Areas)	16.2	31.0	24.2	20.5	20.5	20.5	20.5
Category 3 Waste Rock	0.001223	0.004980	0.008771	0.012574	0.006628	0.006628	0.006628
Category 3 Lean Ore	0.001352	0.002301	0.003203	0.004570	0.002773	0.002773	0.002773
Category 4 Waste Rock	0.000171	0.001371	0.001570	0.001422	0.000131	0.000131	0.000131
Lean Ore Surge Pile	0.002085	0.002085	0.002085	0.002085	0.002085	0	0

Stockpile	Average Liner Leakage Rate under Proposed Action (gpm)						
	Year 1	Year 5	Year 10	Year 15	Year 20	Closure	Post-Closure
Category 1/2 Waste Rock	50.9	142.3	163.3	159.7	159.7	159.7	159.7
Category 1/2 (Overburden Areas)	18.6	36.6	30.2	28.1	28.1	28.1	28.1
Category 3 Waste Rock	0.002011	0.008371	0.014869	0.021733	0.013148	0.013148	0.013148
Category 3 Lean Ore	0.002211	0.003842	0.005454	0.008010	0.005460	0.005460	0.005460
Category 4 Waste Rock	0.000280	0.002237	0.002536	0.002289	0.000131	0.000131	0.000131
Lean Ore Surge Pile	0.003409	0.003409	0.003409	0.003409	0.003409	0	0

Stockpile	High Liner Leakage Rate under Proposed Action (gpm)						
	Year 1	Year 5	Year 10	Year 15	Year 20	Closure	Post-Closure
Category 1/2 Waste Rock	172.5	469.5	506.4	425.9	425.9	425.9	425.9
Category 1/2 (Overburden Areas)	64.1	121.2	92.3	75.1	75.1	75.1	75.1
Category 3 Waste Rock	0.010453	0.043517	0.077379	0.113243	0.070709	0.070709	0.070709
Category 3 Lean Ore	0.062496	0.108580	0.154510	0.227554	0.158460	0.158460	0.158460
Category 4 Waste Rock	0.007901	0.063674	0.074159	0.067621	0.010373	0.010373	0.010373
Lean Ore Surge Pile	0.096353	0.096348	0.096353	0.096348	0.096353	0	0

Table 4-7. Parameter Concentrations in Leachate from Category 1/2 Waste Rock Stockpile under Proposed Action (Low Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	7.80E-06	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04
Al	mg/L	1.90E-02	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00
As	mg/L	1.01E-03	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01
B	mg/L	8.32E-04	7.36E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01
Ba	mg/L	1.68E-03	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01
Be	mg/L	3.41E-05	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04
Ca	mg/L	2.58E-01	2.28E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02
Cd	mg/L	5.99E-06	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04
Cl	mg/L	1.06E-01	2.68E+01	2.49E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co	mg/L	1.61E-05	1.42E-02	3.57E-02	5.20E-02	5.20E-02	5.20E-02	5.20E-02
Cu	mg/L	2.72E-04	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02
F	mg/L	7.70E-03	6.26E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02
Fe	mg/L	2.88E-03	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01
Hardness	mg/L	8.37E-01	7.40E+02	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03
K	mg/L	1.58E-01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01
Mg	mg/L	4.69E-02	4.14E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01
Mn	mg/L	3.52E-04	3.11E-01	7.50E-01	7.50E-01	7.50E-01	7.50E-01	7.50E-01
Na	mg/L	2.63E-01	2.32E+02	5.83E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02
Ni	mg/L	1.04E-04	9.23E-02	2.31E-01	3.82E-01	3.82E-01	3.82E-01	3.82E-01
Pb	mg/L	1.25E-05	1.10E-02	2.76E-02	4.57E-02	4.57E-02	4.57E-02	4.57E-02
Sb	mg/L	4.54E-04	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02
Se	mg/L	3.11E-05	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03
SO ₄	mg/L	5.81E-01	5.14E+02	1.29E+03	2.13E+03	2.13E+03	2.13E+03	2.13E+03
Tl	mg/L	3.00E-06	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05
V	mg/L	3.85E-04	3.40E-01	8.53E-01	1.41E+00	1.41E+00	1.41E+00	1.41E+00
Zn	mg/L	3.64E-04	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02

¹ Value from Year 30

Table 4-8. Parameter Concentrations in Lachate from Category 1/2 Waste Rock Stockpile under Proposed Action (Average Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	4.37E-06	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04
Al	mg/L	1.06E-02	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00
As	mg/L	5.64E-04	4.93E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01
B	mg/L	4.67E-04	4.08E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01
Ba	mg/L	9.44E-04	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01
Be	mg/L	1.91E-05	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04
Ca	mg/L	1.45E-01	1.26E+02	3.04E+02	4.36E+02	4.36E+02	4.36E+02	4.36E+02
Cd	mg/L	3.36E-06	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04
Cl	mg/L	5.93E-02	1.48E+01	1.32E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co	mg/L	9.03E-06	7.89E-03	1.90E-02	2.72E-02	2.72E-02	2.72E-02	2.72E-02
Cu	mg/L	1.53E-04	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02
F	mg/L	4.32E-03	6.28E-02	6.25E-02	6.23E-02	6.23E-02	6.23E-02	6.23E-02
Fe	mg/L	1.61E-03	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01
Hardness	mg/L	4.69E-01	4.10E+02	9.85E+02	1.41E+03	1.41E+03	1.41E+03	1.41E+03
K	mg/L	8.85E-02	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01
Mg	mg/L	2.63E-02	2.29E+01	5.52E+01	7.91E+01	7.91E+01	7.91E+01	7.91E+01
Mn	mg/L	1.97E-04	1.72E-01	4.14E-01	5.94E-01	5.94E-01	5.94E-01	5.94E-01
Na	mg/L	1.47E-01	1.29E+02	3.09E+02	4.44E+02	4.44E+02	4.44E+02	4.44E+02
Ni	mg/L	5.85E-05	5.11E-02	1.23E-01	1.76E-01	1.76E-01	1.76E-01	1.76E-01
Pb	mg/L	6.99E-06	6.10E-03	1.47E-02	2.10E-02	2.10E-02	2.10E-02	2.10E-02
Sb	mg/L	2.55E-04	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02
Se	mg/L	1.74E-05	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03
SO ₄	mg/L	3.26E-01	2.84E+02	6.84E+02	9.81E+02	9.81E+02	9.81E+02	9.81E+02
Tl	mg/L	1.68E-06	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05
V	mg/L	2.16E-04	1.88E-01	4.53E-01	6.50E-01	6.50E-01	6.50E-01	6.50E-01
Zn	mg/L	2.04E-04	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02

¹ Value from Year 30

Table 4-9. Parameter Concentrations in Leachate from Category 1/2 Waste Rock Stockpile under Proposed Action (High Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	3.04E-06	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04
Al	mg/L	7.40E-03	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00
As	mg/L	3.92E-04	3.43E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01
B	mg/L	3.25E-04	2.84E-01	6.81E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01
Ba	mg/L	6.57E-04	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01
Be	mg/L	1.33E-05	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04
Ca	mg/L	1.01E-01	8.79E+01	2.11E+02	3.03E+02	3.03E+02	3.03E+02	3.03E+02
Cd	mg/L	2.34E-06	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04
Cl	mg/L	4.12E-02	1.03E+01	9.20E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co	mg/L	6.28E-06	5.49E-03	1.32E-02	1.89E-02	1.89E-02	1.89E-02	1.89E-02
Cu	mg/L	1.06E-04	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02
F	mg/L	3.00E-03	6.29E-02	6.27E-02	6.25E-02	6.25E-02	6.25E-02	6.25E-02
Fe	mg/L	1.12E-03	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01
Hardness	mg/L	3.26E-01	2.85E+02	6.85E+02	9.80E+02	9.80E+02	9.80E+02	9.80E+02
K	mg/L	6.16E-02	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01
Mg	mg/L	1.83E-02	1.60E+01	3.83E+01	5.49E+01	5.49E+01	5.49E+01	5.49E+01
Mn	mg/L	1.37E-04	1.20E-01	2.88E-01	4.12E-01	4.12E-01	4.12E-01	4.12E-01
Na	mg/L	1.02E-01	8.95E+01	2.15E+02	3.08E+02	3.08E+02	3.08E+02	3.08E+02
Ni	mg/L	4.07E-05	3.55E-02	8.54E-02	1.22E-01	1.22E-01	1.22E-01	1.22E-01
Pb	mg/L	4.86E-06	4.24E-03	1.02E-02	1.46E-02	1.46E-02	1.46E-02	1.46E-02
Sb	mg/L	1.77E-04	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02
Se	mg/L	1.21E-05	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03
SO ₄	mg/L	2.27E-01	1.98E+02	4.75E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02
Tl	mg/L	1.17E-06	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05
V	mg/L	1.50E-04	1.31E-01	3.15E-01	4.51E-01	4.51E-01	4.51E-01	4.51E-01
Zn	mg/L	1.42E-04	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02

¹ Value from Year 30

Table 4-10. Parameter Concentrations in Leachate from Category 3 Waste Rock Stockpile under Proposed Action (Low Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04
Al	mg/L	1.68E+00	1.68E+00	8.30E+01	8.30E+01	8.30E+01	8.30E+01	8.30E+01
As	mg/L	6.86E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01
B	mg/L	6.96E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01
Ba	mg/L	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01
Be	mg/L	2.00E-04	2.00E-04	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03
Ca	mg/L	4.49E+02	5.40E+02	4.80E+02	4.80E+02	4.80E+02	4.80E+02	4.80E+02
Cd	mg/L	1.80E-04	1.80E-04	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02
Cl	mg/L	2.37E+01	1.53E+01	6.69E+00	9.36E+00	3.51E+01	0.00E+00	0.00E+00
Co	mg/L	5.20E-02	5.20E-02	4.40E+01	4.40E+01	4.40E+01	4.40E+01	4.40E+01
Cu	mg/L	9.20E-02	9.20E-02	2.02E+02	2.02E+02	2.02E+02	2.02E+02	2.02E+02
F	mg/L	6.23E-02	6.21E-02	6.22E-02	6.22E-02	6.22E-02	6.22E-02	6.22E-02
Fe	mg/L	8.10E-01	8.10E-01	1.48E+02	2.19E+02	2.35E+02	2.35E+02	2.35E+02
Hardness	mg/L	1.43E+03	1.73E+03	5.44E+03	5.44E+03	5.44E+03	5.44E+03	5.44E+03
K	mg/L	4.90E+01	4.90E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01
Mg	mg/L	7.60E+01	9.30E+01	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03
Mn	mg/L	7.50E-01	7.50E-01	4.70E+01	4.70E+01	4.70E+01	4.70E+01	4.70E+01
Na	mg/L	2.52E+02	6.81E+02	3.38E+02	3.38E+02	3.38E+02	3.38E+02	3.38E+02
Ni	mg/L	8.60E-01	8.60E-01	7.62E+02	7.62E+02	7.62E+02	7.62E+02	7.62E+02
Pb	mg/L	1.13E-02	3.19E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02
Sb	mg/L	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02
Se	mg/L	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03
SO ₄	mg/L	2.02E+03	2.34E+03	9.60E+03	9.60E+03	9.60E+03	9.60E+03	9.60E+03
V	mg/L	1.61E-01	4.53E-01	2.91E+00	4.32E+00	1.59E+01	2.23E+01	2.23E+01
Tl	mg/L	2.00E-05	2.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05
Zn	mg/L	9.00E-02	9.00E-02	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01

¹ Value from Year 30

Table 4-11. Parameter Concentrations in Leachate from Category 3 Waste Rock Stockpile under Proposed Action (Average Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04
Al	mg/L	1.68E+00	1.68E+00	7.50E+01	8.30E+01	8.30E+01	8.30E+01	8.30E+01
As	mg/L	3.96E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01
B	mg/L	4.02E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01
Ba	mg/L	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01
Be	mg/L	2.00E-04	2.00E-04	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03
Ca	mg/L	2.59E+02	5.40E+02	4.80E+02	4.80E+02	4.80E+02	4.80E+02	4.80E+02
Cd	mg/L	1.80E-04	1.80E-04	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02
Cl	mg/L	1.37E+01	8.64E+00	3.74E+00	5.12E+00	1.61E+01	0.00E+00	0.00E+00
Co	mg/L	5.20E-02	5.20E-02	3.57E+01	4.40E+01	4.40E+01	4.40E+01	4.40E+01
Cu	mg/L	9.20E-02	9.20E-02	2.01E+02	2.02E+02	2.02E+02	2.02E+02	2.02E+02
F	mg/L	6.26E-02	6.21E-02	6.22E-02	6.22E-02	6.22E-02	6.22E-02	6.22E-02
Fe	mg/L	8.10E-01	8.10E-01	8.25E+01	1.20E+02	2.35E+02	2.35E+02	2.35E+02
Hardness	mg/L	8.27E+02	1.73E+03	4.36E+03	5.44E+03	5.44E+03	5.44E+03	5.44E+03
K	mg/L	4.90E+01	4.90E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01
Mg	mg/L	4.39E+01	9.30E+01	7.69E+02	1.03E+03	1.03E+03	1.03E+03	1.03E+03
Mn	mg/L	7.50E-01	7.50E-01	4.70E+01	4.70E+01	4.70E+01	4.70E+01	4.70E+01
Na	mg/L	1.45E+02	4.01E+02	3.38E+02	3.38E+02	3.38E+02	3.38E+02	3.38E+02
Ni	mg/L	8.60E-01	8.60E-01	4.29E+02	6.24E+02	7.62E+02	7.62E+02	7.62E+02
Pb	mg/L	6.53E-03	1.80E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02
Sb	mg/L	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02
Se	mg/L	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03
SO ₄	mg/L	1.17E+03	2.34E+03	9.60E+03	9.60E+03	9.60E+03	9.60E+03	9.60E+03
Tl	mg/L	2.00E-05	2.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05
V	mg/L	9.28E-02	2.56E-01	1.63E+00	2.36E+00	7.31E+00	1.02E+01	1.02E+01
Zn	mg/L	9.00E-02	9.00E-02	2.31E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01

¹ Value from Year 30

Table 4-12. Parameter Concentrations in Leachate from Category 3 Waste Rock Stockpile under Proposed Action (High Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04
Al	mg/L	1.68E+00	1.68E+00	5.21E+01	7.57E+01	8.30E+01	8.30E+01	8.30E+01
As	mg/L	2.76E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01
B	mg/L	2.80E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01
Ba	mg/L	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01
Be	mg/L	2.00E-04	2.00E-04	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03
Ca	mg/L	1.80E+02	4.97E+02	4.80E+02	4.80E+02	4.80E+02	4.80E+02	4.80E+02
Cd	mg/L	1.80E-04	1.80E-04	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02
Cl	mg/L	9.53E+00	6.01E+00	2.60E+00	3.55E+00	1.09E+01	0.00E+00	0.00E+00
Co	mg/L	5.20E-02	5.20E-02	2.48E+01	3.61E+01	4.40E+01	4.40E+01	4.40E+01
Cu	mg/L	9.20E-02	9.20E-02	1.40E+02	2.02E+02	2.02E+02	2.02E+02	2.02E+02
F	mg/L	6.27E-02	6.22E-02	6.22E-02	6.22E-02	6.22E-02	6.22E-02	6.22E-02
Fe	mg/L	8.10E-01	8.10E-01	5.74E+01	8.33E+01	2.35E+02	2.35E+02	2.35E+02
Hardness	mg/L	5.75E+02	1.59E+03	3.40E+03	4.39E+03	5.44E+03	5.44E+03	5.44E+03
K	mg/L	4.90E+01	4.90E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01
Mg	mg/L	3.05E+01	8.42E+01	5.34E+02	7.76E+02	1.03E+03	1.03E+03	1.03E+03
Mn	mg/L	7.50E-01	7.50E-01	4.06E+01	4.70E+01	4.70E+01	4.70E+01	4.70E+01
Na	mg/L	1.01E+02	2.79E+02	3.38E+02	3.38E+02	3.38E+02	3.38E+02	3.38E+02
Ni	mg/L	8.60E-01	8.60E-01	2.98E+02	4.33E+02	7.62E+02	7.62E+02	7.62E+02
Pb	mg/L	4.54E-03	1.25E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02
Sb	mg/L	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02
Se	mg/L	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03
SO ₄	mg/L	8.11E+02	2.24E+03	9.60E+03	9.60E+03	9.60E+03	9.60E+03	9.60E+03
Tl	mg/L	2.00E-05	2.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05
V	mg/L	6.46E-02	1.78E-01	1.13E+00	1.64E+00	4.93E+00	6.89E+00	6.89E+00
Zn	mg/L	9.00E-02	9.00E-02	1.61E+01	2.33E+01	2.60E+01	2.60E+01	2.60E+01

¹ Value in Year 30

Table 4-13. Parameter Concentrations in Leachate from Category 3 Lean Ore stockpile under Proposed Action (Low Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04
Al	mg/L	1.68E+00	1.68E+00	8.30E+01	8.30E+01	8.30E+01	8.30E+01	8.30E+01
As	mg/L	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01
B	mg/L	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01
Ba	mg/L	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01
Be	mg/L	2.00E-04	2.00E-04	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03
Ca	mg/L	5.40E+02	5.40E+02	4.80E+02	4.80E+02	4.80E+02	4.80E+02	4.80E+02
Cd	mg/L	1.80E-04	1.80E-04	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02
Cl	mg/L	2.96E+01	1.17E+01	1.40E+01	2.67E+01	2.06E+01	0.00E+00	0.00E+00
Co	mg/L	5.20E-02	5.20E-02	4.40E+01	4.40E+01	4.40E+01	4.40E+01	4.40E+01
Cu	mg/L	9.20E-02	9.20E-02	2.02E+02	2.02E+02	2.02E+02	2.02E+02	2.02E+02
F	mg/L	6.21E-02	6.21E-02	6.22E-02	6.22E-02	6.22E-02	6.22E-02	6.22E-02
Fe	mg/L	8.10E-01	8.10E-01	2.35E+02	2.35E+02	2.35E+02	2.35E+02	2.35E+02
Hardness	mg/L	1.73E+03	1.73E+03	5.44E+03	5.44E+03	5.44E+03	5.44E+03	5.44E+03
K	mg/L	4.90E+01	4.90E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01
Mg	mg/L	9.30E+01	9.30E+01	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03
Mn	mg/L	7.50E-01	7.50E-01	4.70E+01	4.70E+01	4.70E+01	4.70E+01	4.70E+01
Na	mg/L	3.15E+02	6.81E+02	3.38E+02	3.38E+02	3.38E+02	3.38E+02	3.38E+02
Ni	mg/L	8.60E-01	8.60E-01	7.62E+02	7.62E+02	7.62E+02	7.62E+02	7.62E+02
Pb	mg/L	1.41E-02	4.32E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02
Sb	mg/L	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02
Se	mg/L	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03
SO ₄	mg/L	2.34E+03	2.34E+03	9.60E+03	9.60E+03	9.60E+03	9.60E+03	9.60E+03
Tl	mg/L	2.00E-05	2.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05
V	mg/L	2.01E-01	6.14E-01	4.92E+00	6.79E+00	2.13E+01	2.78E+01	2.78E+01
Zn	mg/L	9.00E-02	9.00E-02	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01

¹ Value in Year 30

Table 4-14. Parameter Concentrations in Leachate from Category 3 Lean Ore stockpile under Proposed Action (Average Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04
Al	mg/L	1.68E+00	1.68E+00	8.30E+01	8.30E+01	8.30E+01	8.30E+01	8.30E+01
As	mg/L	4.95E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01
B	mg/L	5.03E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01
Ba	mg/L	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01
Be	mg/L	2.00E-04	2.00E-04	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03
Ca	mg/L	3.24E+02	5.40E+02	4.80E+02	4.80E+02	4.80E+02	4.80E+02	4.80E+02
Cd	mg/L	1.80E-04	1.80E-04	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02
Cl	mg/L	1.71E+01	6.59E+00	7.71E+00	1.43E+01	9.45E+00	0.00E+00	0.00E+00
Co	mg/L	5.20E-02	5.20E-02	4.40E+01	4.40E+01	4.40E+01	4.40E+01	4.40E+01
Cu	mg/L	9.20E-02	9.20E-02	2.02E+02	2.02E+02	2.02E+02	2.02E+02	2.02E+02
F	mg/L	6.25E-02	6.21E-02	6.22E-02	6.22E-02	6.22E-02	6.22E-02	6.22E-02
Fe	mg/L	8.10E-01	8.10E-01	1.38E+02	1.84E+02	2.35E+02	2.35E+02	2.35E+02
Hardness	mg/L	1.03E+03	1.73E+03	5.44E+03	5.44E+03	5.44E+03	5.44E+03	5.44E+03
K	mg/L	4.90E+01	4.90E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01
Mg	mg/L	5.49E+01	9.30E+01	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03
Mn	mg/L	7.50E-01	7.50E-01	4.70E+01	4.70E+01	4.70E+01	4.70E+01	4.70E+01
Na	mg/L	1.82E+02	5.43E+02	3.38E+02	3.38E+02	3.38E+02	3.38E+02	3.38E+02
Ni	mg/L	8.60E-01	8.60E-01	7.16E+02	7.62E+02	7.62E+02	7.62E+02	7.62E+02
Pb	mg/L	8.16E-03	2.44E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02
Sb	mg/L	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02
Se	mg/L	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03
SO ₄	mg/L	1.46E+03	2.34E+03	9.60E+03	9.60E+03	9.60E+03	9.60E+03	9.60E+03
Tl	mg/L	2.00E-05	2.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05
V	mg/L	1.16E-01	3.47E-01	2.71E+00	3.62E+00	9.78E+00	1.28E+01	1.28E+01
Zn	mg/L	9.00E-02	9.00E-02	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01

¹ Value in Year 30

Table 4-15. Parameter Concentrations in Leachate from Category 3 Lean Ore stockpile under Proposed Action (High Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04
Al	mg/L	1.68E+00	1.68E+00	8.30E+01	8.30E+01	8.30E+01	8.30E+01	8.30E+01
As	mg/L	3.45E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01
B	mg/L	3.50E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01
Ba	mg/L	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01
Be	mg/L	2.00E-04	2.00E-04	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03
Ca	mg/L	2.26E+02	5.40E+02	4.80E+02	4.80E+02	4.80E+02	4.80E+02	4.80E+02
Cd	mg/L	1.80E-04	1.80E-04	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02
Cl	mg/L	1.19E+01	4.59E+00	5.35E+00	9.86E+00	6.39E+00	0.00E+00	0.00E+00
Co	mg/L	5.20E-02	5.20E-02	4.14E+01	4.40E+01	4.40E+01	4.40E+01	4.40E+01
Cu	mg/L	9.20E-02	9.20E-02	2.02E+02	2.02E+02	2.02E+02	2.02E+02	2.02E+02
F	mg/L	6.27E-02	6.21E-02	6.22E-02	6.22E-02	6.22E-02	6.22E-02	6.22E-02
Fe	mg/L	8.10E-01	8.10E-01	9.56E+01	1.27E+02	2.35E+02	2.35E+02	2.35E+02
Hardness	mg/L	7.20E+02	1.73E+03	4.86E+03	5.44E+03	5.44E+03	5.44E+03	5.44E+03
K	mg/L	4.90E+01	4.90E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01
Mg	mg/L	3.82E+01	9.30E+01	8.91E+02	1.03E+03	1.03E+03	1.03E+03	1.03E+03
Mn	mg/L	7.50E-01	7.50E-01	4.70E+01	4.70E+01	4.70E+01	4.70E+01	4.70E+01
Na	mg/L	1.27E+02	3.78E+02	3.38E+02	3.38E+02	3.38E+02	3.38E+02	3.38E+02
Ni	mg/L	8.60E-01	8.60E-01	4.97E+02	6.61E+02	7.62E+02	7.62E+02	7.62E+02
Pb	mg/L	5.68E-03	1.70E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02
Sb	mg/L	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02
Se	mg/L	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03
SO ₄	mg/L	1.01E+03	2.34E+03	9.60E+03	9.60E+03	9.60E+03	9.60E+03	9.60E+03
Tl	mg/L	2.00E-05	2.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05
V	mg/L	8.08E-02	2.41E-01	1.88E+00	2.51E+00	6.62E+00	8.64E+00	8.64E+00
Zn	mg/L	9.00E-02	9.00E-02	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01

¹ Value in Year 30

Table 4-16. Parameter Concentrations in Leachate from Category 4 Waste Rock stockpile under Proposed Action (Low Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 15	Mine Year 20	Closure ¹	Post- closure ¹
Ag	mg/L	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04
Al	mg/L	4.67E+01	8.30E+01	8.30E+01	8.30E+01	8.30E+01	8.30E+01	8.30E+01
As	mg/L	5.10E-02	2.24E-01	5.26E-01	7.07E-01	7.10E-01	7.10E-01	7.10E-01
B	mg/L	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01
Ba	mg/L	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01
Be	mg/L	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03
Ca	mg/L	1.04E+02	4.56E+02	4.80E+02	4.80E+02	4.80E+02	4.80E+02	4.80E+02
Cd	mg/L	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02
Cl	mg/L	9.46E+00	1.63E+01	8.23E+00	4.13E-01	4.35E+01	0.00E+00	0.00E+00
Co	mg/L	3.65E+00	1.60E+01	3.77E+01	4.40E+01	4.40E+01	4.40E+01	4.40E+01
Cu	mg/L	6.59E-01	2.90E+00	6.81E+00	9.14E+00	2.02E+02	2.02E+02	2.02E+02
F	mg/L	6.29E-02	6.22E-02	6.22E-02	6.22E-02	6.22E-02	6.22E-02	6.22E-02
Fe	mg/L	2.35E+02	2.35E+02	2.35E+02	2.35E+02	2.35E+02	2.35E+02	2.35E+02
Hardness	mg/L	7.42E+02	3.26E+03	5.44E+03	5.44E+03	5.44E+03	5.44E+03	5.44E+03
K	mg/L	3.80E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01
Mg	mg/L	1.18E+02	5.17E+02	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03
Mn	mg/L	8.25E+00	3.63E+01	4.70E+01	4.70E+01	4.70E+01	4.70E+01	4.70E+01
Na	mg/L	4.44E+01	1.95E+02	3.38E+02	3.38E+02	3.38E+02	3.38E+02	3.38E+02
Ni	mg/L	4.46E+01	1.96E+02	4.61E+02	6.19E+02	7.62E+02	7.62E+02	7.62E+02
Pb	mg/L	5.28E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02
Sb	mg/L	1.87E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02
Se	mg/L	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03
SO ₄	mg/L	4.66E+03	9.60E+03	9.60E+03	9.60E+03	9.60E+03	9.60E+03	9.60E+03
Tl	mg/L	6.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05
V	mg/L	9.08E-03	3.99E-02	9.38E-02	1.26E-01	6.13E+00	6.27E+00	6.27E+00
Zn	mg/L	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01

¹ Value in Year 30

Table 4-17. Parameter Concentrations in Leachate from Category 4 Waste Rock stockpile under Proposed Action (Average Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04
Al	mg/L	2.70E+01	8.30E+01	8.30E+01	8.30E+01	8.30E+01	8.30E+01	8.30E+01
As	mg/L	2.94E-02	1.29E-01	3.02E-01	4.05E-01	7.10E-01	7.10E-01	7.10E-01
B	mg/L	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01
Ba	mg/L	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01
Be	mg/L	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03
Ca	mg/L	5.99E+01	2.63E+02	4.80E+02	4.80E+02	4.80E+02	4.80E+02	4.80E+02
Cd	mg/L	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02
Cl	mg/L	5.46E+00	9.41E+00	4.73E+00	2.37E-01	1.45E+01	0.00E+00	0.00E+00
Co	mg/L	2.11E+00	9.25E+00	2.17E+01	2.90E+01	4.40E+01	4.40E+01	4.40E+01
Cu	mg/L	3.80E-01	1.67E+00	3.91E+00	5.24E+00	1.48E+02	1.52E+02	1.52E+02
F	mg/L	6.30E-02	6.26E-02	6.22E-02	6.22E-02	6.22E-02	6.22E-02	6.22E-02
Fe	mg/L	2.35E+02	2.35E+02	2.35E+02	2.35E+02	2.35E+02	2.35E+02	2.35E+02
Hardness	mg/L	4.29E+02	1.88E+03	4.07E+03	5.05E+03	5.44E+03	5.44E+03	5.44E+03
K	mg/L	3.80E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01
Mg	mg/L	6.79E+01	2.98E+02	6.98E+02	9.35E+02	1.03E+03	1.03E+03	1.03E+03
Mn	mg/L	4.77E+00	2.09E+01	4.70E+01	4.70E+01	4.70E+01	4.70E+01	4.70E+01
Na	mg/L	2.57E+01	1.13E+02	2.64E+02	3.38E+02	3.38E+02	3.38E+02	3.38E+02
Ni	mg/L	2.58E+01	1.13E+02	2.65E+02	3.55E+02	7.62E+02	7.62E+02	7.62E+02
Pb	mg/L	3.26E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02
Sb	mg/L	1.08E-02	4.74E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02
Se	mg/L	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03
SO ₄	mg/L	2.69E+03	9.60E+03	9.60E+03	9.60E+03	9.60E+03	9.60E+03	9.60E+03
Tl	mg/L	6.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05
V	mg/L	5.24E-03	2.30E-02	5.39E-02	7.22E-02	2.04E+00	2.09E+00	2.09E+00
Zn	mg/L	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01

¹ Value from Year 30

Table 4-18. Parameter Concentrations in Leachate from Category 4 Waste Rock Stockpile under Proposed Action (High Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04
Al	mg/L	1.88E+01	8.19E+01	8.30E+01	8.30E+01	8.30E+01	8.30E+01	8.30E+01
As	mg/L	2.05E-02	8.93E-02	2.04E-01	2.71E-01	7.10E-01	7.10E-01	7.10E-01
B	mg/L	5.91E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01
Ba	mg/L	1.58E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01
Be	mg/L	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03
Ca	mg/L	4.17E+01	1.82E+02	4.16E+02	4.80E+02	4.80E+02	4.80E+02	4.80E+02
Cd	mg/L	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02
Cl	mg/L	3.80E+00	6.51E+00	3.19E+00	1.59E-01	2.90E+00	0.00E+00	0.00E+00
Co	mg/L	1.47E+00	6.40E+00	1.46E+01	1.94E+01	4.40E+01	4.40E+01	4.40E+01
Cu	mg/L	2.65E-01	1.16E+00	2.64E+00	3.51E+00	2.97E+01	3.03E+01	3.03E+01
F	mg/L	6.30E-02	6.27E-02	6.23E-02	6.22E-02	6.22E-02	6.22E-02	6.22E-02
Fe	mg/L	2.35E+02	2.35E+02	2.35E+02	2.35E+02	2.35E+02	2.35E+02	2.35E+02
Hardness	mg/L	2.98E+02	1.30E+03	2.98E+03	3.77E+03	5.44E+03	5.44E+03	5.44E+03
K	mg/L	3.77E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01
Mg	mg/L	4.73E+01	2.06E+02	4.71E+02	6.26E+02	1.03E+03	1.03E+03	1.03E+03
Mn	mg/L	3.32E+00	1.45E+01	3.31E+01	4.39E+01	4.70E+01	4.70E+01	4.70E+01
Na	mg/L	1.79E+01	7.79E+01	1.78E+02	2.37E+02	3.38E+02	3.38E+02	3.38E+02
Ni	mg/L	1.79E+01	7.82E+01	1.79E+02	2.38E+02	7.62E+02	7.62E+02	7.62E+02
Pb	mg/L	2.27E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02
Sb	mg/L	7.52E-03	3.28E-02	7.50E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02
Se	mg/L	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03
SO ₄	mg/L	1.88E+03	8.18E+03	9.60E+03	9.60E+03	9.60E+03	9.60E+03	9.60E+03
Tl	mg/L	6.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05
V	mg/L	3.65E-03	1.59E-02	3.64E-02	4.83E-02	4.09E-01	4.18E-01	4.18E-01
Zn	mg/L	1.90E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01

¹ Value from Year 30

Table 4-19. Parameter Concentrations in Leachate from Lean Ore Surge Pile under Proposed Action (Low Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	2.50E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	--	--
Al	mg/L	4.02E+00	6.76E+01	8.30E+01	8.30E+01	8.30E+01	--	--
As	mg/L	4.39E-03	7.38E-02	1.06E-01	2.85E-01	2.29E-01	--	--
B	mg/L	1.27E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	--	--
Ba	mg/L	3.39E-02	1.90E-01	1.90E-01	1.90E-01	1.90E-01	--	--
Be	mg/L	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03	--	--
Ca	mg/L	8.93E+00	1.50E+02	2.16E+02	4.80E+02	4.65E+02	--	--
Cd	mg/L	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	--	--
Cl	mg/L	8.98E-01	8.18E-01	2.05E+00	3.98E-01	2.54E+00	--	--
Co	mg/L	3.14E-01	5.29E+00	7.61E+00	2.04E+01	1.64E+01	--	--
Cu	mg/L	5.68E-02	9.54E-01	1.37E+00	3.68E+00	2.96E+00	--	--
F	mg/L	6.30E-02	6.28E-02	6.27E-02	6.22E-02	6.22E-02	--	--
Fe	mg/L	7.80E+01	2.35E+02	2.35E+02	2.35E+02	2.35E+02	--	--
Hardness	mg/L	6.40E+01	1.08E+03	1.55E+03	3.90E+03	3.33E+03	--	--
K	mg/L	8.08E+00	3.80E+01	3.80E+01	3.80E+01	3.80E+01	--	--
Mg	mg/L	1.01E+01	1.70E+02	2.45E+02	6.57E+02	5.27E+02	--	--
Mn	mg/L	7.11E-01	1.20E+01	1.72E+01	4.61E+01	3.70E+01	--	--
Na	mg/L	3.83E+00	6.43E+01	9.26E+01	2.48E+02	1.99E+02	--	--
Ni	mg/L	3.84E+00	6.46E+01	9.30E+01	2.49E+02	2.00E+02	--	--
Pb	mg/L	4.87E-03	5.28E-02	5.28E-02	5.28E-02	5.28E-02	--	--
Sb	mg/L	1.61E-03	2.71E-02	3.90E-02	8.00E-02	8.00E-02	--	--
Se	mg/L	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	--	--
SO ₄	mg/L	4.02E+02	6.76E+03	9.60E+03	9.60E+03	9.60E+03	--	--
Tl	mg/L	6.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05	--	--
V	mg/L	7.82E-04	1.31E-02	1.89E-02	5.07E-02	4.07E-02	--	--
Zn	mg/L	4.08E+00	2.60E+01	2.60E+01	2.60E+01	2.60E+01	--	--

¹ Stockpile removed at end of year 20

Table 4-20. Parameter Concentrations in Leachate from Lean Ore Surge Pile under Proposed Action (Average Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	1.44E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	--	--
Al	mg/L	2.32E+00	3.90E+01	5.62E+01	8.30E+01	8.30E+01	--	--
As	mg/L	2.53E-03	4.26E-02	6.13E-02	1.64E-01	1.32E-01	--	--
B	mg/L	7.32E-02	7.60E-01	7.60E-01	7.60E-01	7.60E-01	--	--
Ba	mg/L	1.96E-02	1.90E-01	1.90E-01	1.90E-01	1.90E-01	--	--
Be	mg/L	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03	--	--
Ca	mg/L	5.16E+00	8.67E+01	1.25E+02	3.35E+02	2.69E+02	--	--
Cd	mg/L	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	--	--
Cl	mg/L	5.19E-01	4.73E-01	1.19E+00	2.30E-01	1.47E+00	--	--
Co	mg/L	1.82E-01	3.05E+00	4.39E+00	1.18E+01	9.46E+00	--	--
Cu	mg/L	3.28E-02	5.51E-01	7.93E-01	2.13E+00	1.71E+00	--	--
F	mg/L	6.31E-02	6.29E-02	6.28E-02	6.25E-02	6.26E-02	--	--
Fe	mg/L	4.50E+01	2.35E+02	2.35E+02	2.35E+02	2.35E+02	--	--
Hardness	mg/L	3.69E+01	6.21E+02	8.94E+02	2.40E+03	1.92E+03	--	--
K	mg/L	4.67E+00	3.80E+01	3.80E+01	3.80E+01	3.80E+01	--	--
Mg	mg/L	5.85E+00	9.83E+01	1.42E+02	3.79E+02	3.05E+02	--	--
Mn	mg/L	4.11E-01	6.90E+00	9.93E+00	2.66E+01	2.14E+01	--	--
Na	mg/L	2.21E+00	3.72E+01	5.35E+01	1.43E+02	1.15E+02	--	--
Ni	mg/L	2.22E+00	3.73E+01	5.37E+01	1.44E+02	1.16E+02	--	--
Pb	mg/L	2.81E-03	4.72E-02	5.28E-02	5.28E-02	5.28E-02	--	--
Sb	mg/L	9.30E-04	1.56E-02	2.25E-02	6.03E-02	4.84E-02	--	--
Se	mg/L	2.39E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	--	--
SO ₄	mg/L	2.32E+02	3.90E+03	5.61E+03	9.60E+03	9.60E+03	--	--
Tl	mg/L	5.43E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05	--	--
V	mg/L	4.52E-04	7.59E-03	1.09E-02	2.93E-02	2.35E-02	--	--
Zn	mg/L	2.36E+00	2.60E+01	2.60E+01	2.60E+01	2.60E+01	--	--

¹ Stockpile removed at end of year 20

Table 4-21. Parameter Concentrations in Leachate from Lean Ore Surge Pile under Proposed Action (High Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	1.01E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	--	--
Al	mg/L	1.62E+00	2.72E+01	3.91E+01	8.30E+01	8.30E+01	--	--
As	mg/L	1.76E-03	2.97E-02	4.27E-02	1.14E-01	9.19E-02	--	--
B	mg/L	5.09E-02	7.60E-01	7.60E-01	7.60E-01	7.60E-01	--	--
Ba	mg/L	1.36E-02	1.90E-01	1.90E-01	1.90E-01	1.90E-01	--	--
Be	mg/L	1.85E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03	--	--
Ca	mg/L	3.59E+00	6.04E+01	8.69E+01	2.33E+02	1.87E+02	--	--
Cd	mg/L	1.04E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	--	--
Cl	mg/L	3.61E-01	3.29E-01	8.26E-01	1.60E-01	1.02E+00	--	--
Co	mg/L	1.26E-01	2.12E+00	3.06E+00	8.20E+00	6.58E+00	--	--
Cu	mg/L	2.28E-02	3.84E-01	5.52E-01	1.48E+00	1.19E+00	--	--
F	mg/L	6.31E-02	6.30E-02	6.29E-02	6.26E-02	6.27E-02	--	--
Fe	mg/L	3.14E+01	2.35E+02	2.35E+02	2.35E+02	2.35E+02	--	--
Hardness	mg/L	2.57E+01	4.32E+02	6.22E+02	1.67E+03	1.34E+03	--	--
K	mg/L	3.25E+00	3.80E+01	3.80E+01	3.80E+01	3.80E+01	--	--
Mg	mg/L	4.07E+00	6.84E+01	9.85E+01	2.64E+02	2.12E+02	--	--
Mn	mg/L	2.86E-01	4.80E+00	6.91E+00	1.85E+01	1.49E+01	--	--
Na	mg/L	1.54E+00	2.59E+01	3.72E+01	9.98E+01	8.01E+01	--	--
Ni	mg/L	1.54E+00	2.60E+01	3.74E+01	1.00E+02	8.04E+01	--	--
Pb	mg/L	1.96E-03	3.29E-02	4.73E-02	5.28E-02	5.28E-02	--	--
Sb	mg/L	6.48E-04	1.09E-02	1.57E-02	4.20E-02	3.37E-02	--	--
Se	mg/L	1.66E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	--	--
SO ₄	mg/L	1.62E+02	2.72E+03	3.91E+03	9.60E+03	8.41E+03	--	--
Tl	mg/L	3.78E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05	--	--
V	mg/L	3.14E-04	5.28E-03	7.61E-03	2.04E-02	1.64E-02	--	--
Zn	mg/L	1.64E+00	2.60E+01	2.60E+01	2.60E+01	2.60E+01	--	--

¹ Stockpile removed at end of year 20

Table 4-22. Leachate Concentration from Overburden Areas

Parameter	Units	Seepage from Overburden Storage and Laydown Area ^{1,2} (Mine Years 1 - 20)	Liner Leakage from Overburden Areas of Category 1/2 Stockpile ² (All Years)
Ag	mg/L	0.00E+00	0.00E+00
Al	mg/L	4.11E-01	1.40E-01
As	mg/L	1.56E-03	2.70E-03
B	mg/L	6.22E-02	3.70E-02
Ba	mg/L	1.68E-02	1.40E-02
Be	mg/L	0.00E+00	0.00E+00
Ca	mg/L	9.37E+00	1.58E+01
Cd	mg/L	6.11E-05	0.00E+00
Cl	mg/L	5.35E+00	2.33E+00
Co	mg/L	1.11E-03	1.30E-03
Cu	mg/L	2.14E-02	1.70E-02
F	mg/L	2.24E-01	4.20E-01
Fe	mg/L	2.26E-01	1.50E-01
Hardness	mg/L	4.35E+01	7.15E+01
K	mg/L	2.26E+00	4.45E+00
Mg	mg/L	4.88E+00	9.01E+00
Mn	mg/L	1.60E-01	1.16E-01
Na	mg/L	4.60E+00	7.19E+00
Ni	mg/L	7.97E-03	1.90E-02
Pb	mg/L	6.73E-04	0.00E+00
Sb	mg/L	3.00E-04	4.00E-04
Se	mg/L	4.44E-04	1.90E-03
SO ₄	mg/L	3.52E+01	6.83E+01
Tl	mg/L	4.00E-05	0.00E+00
V	mg/L	1.73E-03	1.40E-03
Zn	mg/L	4.56E-03	3.00E-03

¹ Stockpile removed at end of year 20

² Parameter concentrations applied to low, average, and high liner leakage rates

Table 4-23. East and West Pit Water Quality under Mine Site-Proposed Action (Low Liner Leakage)

Parameter Units		East Pit		West pit
		Closure ¹	Post-Closure ²	Post-Closure ²
Ag	mg/L	1.19E-03	2.66E-04	1.00E-03
Al	mg/L	1.67E+00	7.23E-01	1.86E-02
As	mg/L	8.73E-02	2.39E-02	9.72E-02
B	mg/L	3.23E-01	2.14E-01	2.56E-01
Ba	mg/L	1.54E-01	3.64E-02	9.48E-02
Be	mg/L	2.91E-04	1.48E-04	7.98E-04
Ca	mg/L	1.62E+02	8.92E+01	9.42E+01
Cd	mg/L	6.92E-04	1.08E-04	1.20E-04
Cl	mg/L	7.20E+01	5.08E+01	1.35E+01
Co	mg/L	8.51E-03	1.76E-03	7.96E-03
Cu	mg/L	9.56E-02	6.51E-02	6.00E-03
Fluoride	mg/L	6.44E+00	6.40E+00	1.32E+00
Fe	mg/L	8.11E-01	8.10E-01	1.00E-01
Hardness	mg/L	5.29E+02	3.04E+02	3.13E+02
K	mg/L	2.64E+01	1.49E+01	1.56E+01
Mg	mg/L	3.04E+01	1.97E+01	1.90E+01
Mn	mg/L	3.28E-01	1.78E-01	1.00E-02
Na	mg/L	5.63E+02	4.29E+02	1.70E+02
Ni	mg/L	8.45E-02	1.53E-02	7.15E-02
Pb	mg/L	9.40E-03	6.23E-03	6.48E-03
Sb	mg/L	8.11E-02	2.85E-02	1.20E-01
Se	mg/L	2.19E-02	1.33E-02	5.67E-03
Sulfate	mg/L	3.22E+02	1.79E+02	2.47E+02
Tl	mg/L	6.58E-04	2.69E-04	2.56E-04
V	mg/L	1.00E-01	2.96E-02	5.71E-02
Zn	mg/L	1.66E-01	2.82E-02	3.80E-02

¹ Maximum concentration reported in between Years 21.4 and 76.8

² Maximum concentration reported in Year 76.8 or later

Table 4-24. East and West Pit Water Quality under Mine Site-Proposed Action (Average Liner Leakage)

Parameter Units		East Pit		West pit
		Closure ¹	Post-Closure ²	Post-Closure ²
Ag	mg/L	1.18E-03	2.21E-04	9.21E-04
Al	mg/L	1.63E+00	5.35E-01	1.86E-02
As	mg/L	8.79E-02	2.29E-02	1.05E-01
B	mg/L	3.47E-01	1.82E-01	2.77E-01
Ba	mg/L	1.48E-01	3.05E-02	9.25E-02
Be	mg/L	3.03E-04	1.23E-04	6.97E-04
Ca	mg/L	1.71E+02	7.30E+01	9.88E+01
Cd	mg/L	8.55E-04	8.68E-05	1.51E-04
Cl	mg/L	8.41E+01	4.25E+01	2.14E+01
Co	mg/L	8.07E-03	1.02E-03	5.95E-03
Cu	mg/L	9.45E-02	5.07E-02	6.00E-03
Fluoride	mg/L	6.68E+00	5.31E+00	2.25E+00
Fe	mg/L	8.10E-01	8.10E-01	1.00E-01
Hardness	mg/L	5.66E+02	2.50E+02	3.31E+02
K	mg/L	2.72E+01	1.22E+01	1.72E+01
Mg	mg/L	3.37E+01	1.66E+01	2.05E+01
Mn	mg/L	3.23E-01	1.46E-01	1.00E-02
Na	mg/L	6.47E+02	3.54E+02	2.20E+02
Ni	mg/L	8.07E-02	8.57E-03	5.41E-02
Pb	mg/L	9.58E-03	4.95E-03	5.19E-03
Sb	mg/L	7.96E-02	2.13E-02	1.06E-01
Se	mg/L	2.51E-02	1.11E-02	7.74E-03
Sulfate	mg/L	3.24E+02	1.32E+02	1.73E+02
Tl	mg/L	6.39E-04	2.19E-04	2.50E-04
V	mg/L	1.03E-01	2.54E-02	6.02E-02
Zn	mg/L	1.85E-01	2.28E-02	4.35E-02

¹ Maximum concentration reported between Years 20.8 and 67.0

² Maximum concentration reported in Year 67.0 or later

Table 4-25. East and West Pit Water Quality under Mine Site-Proposed Action (High Liner Leakage)

Parameter Units		East Pit		West pit
		Closure ¹	Post-Closure ²	Post-Closure ²
Ag	mg/L	1.20E-03	2.21E-04	9.07E-04
Al	mg/L	1.67E+00	6.49E-01	1.86E-02
As	mg/L	8.78E-02	2.16E-02	1.98E-01
B	mg/L	3.18E-01	1.20E-01	3.31E-01
Ba	mg/L	1.55E-01	2.98E-02	1.08E-01
Be	mg/L	2.87E-04	1.16E-04	6.42E-04
Ca	mg/L	1.58E+02	5.02E+01	1.10E+02
Cd	mg/L	6.43E-04	5.57E-05	1.38E-04
Cl	mg/L	6.79E+01	2.14E+01	1.15E+01
Co	mg/L	8.48E-03	1.70E-03	7.50E-03
Cu	mg/L	9.50E-02	6.22E-02	6.00E-03
Fluoride	mg/L	4.30E+00	2.37E+00	1.06E+00
Fe	mg/L	8.11E-01	8.10E-01	1.00E-01
Hardness	mg/L	5.14E+02	1.74E+02	3.64E+02
K	mg/L	2.59E+01	7.91E+00	2.07E+01
Mg	mg/L	2.92E+01	1.18E+01	2.19E+01
Mn	mg/L	3.30E-01	1.85E-01	1.00E-02
Na	mg/L	5.33E+02	1.63E+02	1.62E+02
Ni	mg/L	8.42E-02	1.51E-02	6.37E-02
Pb	mg/L	9.26E-03	3.28E-03	5.50E-03
Sb	mg/L	8.12E-02	2.40E-02	1.06E-01
Se	mg/L	2.09E-02	5.16E-03	5.19E-03
Sulfate	mg/L	3.14E+02	9.65E+01	2.12E+02
Tl	mg/L	6.64E-04	3.02E-04	2.39E-04
V	mg/L	1.00E-01	1.92E-02	7.78E-02
Zn	mg/L	1.59E-01	2.36E-02	4.86E-02

¹ Maximum concentration reported between Years 21.2 to 61.1

² Maximum concentration reported in Year 61.1 or later

Table 4-26. Proposed East and West Pit Flooding Schedule - Average Flows for Mine Site Proposed Action

		Source of water to West Pit - AVERAGE FLOWS FOR MINE SITE PROPOSED ACTION																								
Year after Mine Closure (Year 20)	Year from Start of Mine	Stormwater runoff from Cat. 1/2 Stockpile to West Pit (acre-feet)	Non-stockpile stormwater runoff within Mine Site to West Pit (acre-feet)	Liner Leakage from Overburden portion of Cat. 1/2 Stockpile to West Pit (acre-feet)	Liner Leakage from Wasterock portion of Cat. 1/2 Stockpile to West Pit (acre-feet)	Direct net precipitation over West Pit (acre-feet)	Groundwater inflow to West Pit (acre-feet)	Liner Leakage from Overburden portion of Cat. 1/2 Stockpile to East Pit (acre-feet)	Liner Leakage from Wasterock portion of Cat. 1/2 Stockpile to East Pit (acre-feet)	Stormwater runoff from Cat. 1/2 Stockpile to East Pit (acre-feet)	Stormwater runoff from Cat. 3 Stockpile to East Pit (acre-feet)	Non-stockpile stormwater runoff within Mine Site to East Pit (acre-feet)	Pumping from WWTF to East Pit (acre-feet) ¹	Direct net precipitation over North East Pit (acre-feet)	Direct net precipitation over Central Pit (acre-feet)	Groundwater inflow to Central Pit (acre-feet)	Groundwater outflow from Central Pit (acre-feet)	Groundwater inflow to East Pit (acre-feet)	Groundwater outflow from East Pit (acre-feet)	Incremental West Pit flooding volume via East Pit (acre-feet)	Incremental West Pit flooding volume directly to West Pit (acre-feet)	Cumulative West Pit flooded volume (acre-feet)	Water elevation in West Pit (ft-MSL)	Remaining storage capacity in West Pit (acre-feet)	Percent full of West Pit (%)	
NA	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	12	-	-	-	-	-	-	-	62.55	-	-	-	185.75	111.13	51.08	1.48	-	1,548.39	-	-	-	-	-	-	-	
NA	13	-	-	-	-	-	-	-	62.55	-	-	-	(830.13)	111.13	51.08	40.64	-	1,446.23	-	-	-	-	-	-	-	
NA	14	-	-	-	-	-	-	-	62.55	-	-	-	(1,038.11)	111.13	51.08	79.80	-	1,344.08	-	-	-	-	-	-	-	
NA	15	-	-	-	-	-	-	-	62.55	-	-	-	1,061.18	111.13	51.08	80.65	(0.00)	1,241.93	0.00	-	-	-	-	-	-	
NA	16	-	-	-	-	-	-	-	62.55	-	-	-	910.17	111.13	51.08	70.97	(3.23)	1,000.00	(41.94)	-	-	-	-	-	-	
NA	17	-	-	-	-	-	-	-	62.55	-	-	-	683.36	111.13	51.08	61.29	(6.45)	758.06	(83.87)	-	-	-	-	-	-	
NA	18	-	-	-	-	-	-	-	62.55	-	-	-	841.27	111.13	51.08	51.61	(9.68)	516.13	(125.81)	-	-	-	-	-	-	
NA	19	-	-	-	-	-	-	-	62.55	-	-	-	1,868.68	111.13	51.08	41.94	(12.90)	274.19	(167.74)	-	-	-	-	-	-	
NA	20	-	-	-	-	-	-	-	62.55	-	-	-	1,521.10	111.13	51.08	32.26	(16.13)	32.26	(209.68)	-	-	-	-	-	-	
1	21	75.56	283.53	-	234.54	219.20	1,307.00	-	15.64	96.00	13.44	287.08	630.94	135.90	-	-	-	33.44	(3.85)	1,208.58	2,119.83	3,328	933	104,685	3.1	
2	22	75.56	283.53	-	234.54	219.20	1,307.00	-	15.64	96.00	13.44	287.08	580.62	135.90	-	-	-	33.44	(3.85)	1,158.26	2,119.83	6,606	982	101,407	6.1	
3	23	75.56	283.53	-	234.54	219.20	1,273.53	-	15.64	96.00	13.44	287.08	539.19	135.90	-	-	-	33.44	(3.85)	1,116.83	2,086.36	9,810	1,022	98,204	9.1	
4	24	75.56	283.53	-	234.54	219.20	1,222.93	-	15.64	96.00	13.44	287.08	504.12	135.90	-	-	-	33.44	(3.85)	1,081.77	2,035.76	12,927	1,056	95,086	12.0	
5	25	75.56	283.53	-	234.54	219.20	1,177.93	-	15.64	96.00	13.44	287.08	473.59	135.90	-	-	-	33.44	(3.85)	1,051.24	1,990.76	15,969	1,087	92,044	14.8	
6	26	75.56	283.53	-	234.54	219.20	1,136.69	-	15.64	96.00	13.44	287.08	446.30	135.90	-	-	-	33.44	(3.85)	1,023.95	1,949.52	18,943	1,115	89,071	17.5	
7	27	75.56	283.53	-	234.54	219.20	1,098.24	-	15.64	96.00	13.44	287.08	421.33	135.90	-	-	-	33.44	(3.85)	998.97	1,911.06	21,853	1,141	86,161	20.2	
8	28	75.56	283.53	-	234.54	219.20	1,061.97	-	15.64	96.00	13.44	287.08	398.00	135.90	-	-	-	33.44	(3.85)	975.64	1,874.80	24,703	1,164	83,310	22.9	
9	29	75.56	283.53	-	234.54	219.20	1,027.52	-	15.64	96.00	13.44	287.08	375.86	135.90	-	-	-	33.44	(3.85)	953.50	1,840.35	27,497	1,185	80,517	25.5	
10	30	75.56	283.53	-	234.54	219.20	994.60	-	15.64	96.00	13.44	287.08	354.55	135.90	-	-	-	33.44	(3.85)	932.19	1,807.43	30,237	1,204	77,777	28.0	
11	31	75.56	283.53	-	234.54	219.20	963.03	-	15.64	96.00	13.44	287.08	333.85	135.90	-	-	-	33.44	(3.85)	911.49	1,775.86	32,924	1,223	75,090	30.5	
12	32	75.56	283.53	-	234.54	219.20	932.64	-	15.64	96.00	13.44	287.08	313.58	135.90	-	-	-	33.44	(3.85)	891.22	1,745.46	35,561	1,240	72,453	32.9	
13	33	75.56	283.53	-	234.54	219.20	903.31	-	15.64	96.00	13.44	287.08	293.61	135.90	-	-	-	33.44	(3.85)	871.25	1,716.14	38,148	1,256	69,866	35.3	
14	34	75.56	283.53	-	234.54	219.20	874.96	-	15.64	96.00	13.44	287.08	282.10	135.90	-	-	-	33.65	(3.85)	859.95	1,687.79	40,696	1,272	67,318	37.7	
15	35	75.56	283.53	-	234.54	219.20	847.42	-	15.64	96.00	13.44	287.08	282.10	135.90	-	-	-	34.11	(3.85)	860.41	1,660.25	43,216	1,287	64,797	40.0	
16	36	75.56	283.53	-	234.54	219.20	820.49	-	15.64	96.00	13.44	287.08	282.10	135.90	-	-	-	34.55	(3.85)	860.85	1,633.32	45,711	1,301	62,303	42.3	
17	37	75.56	283.53	-	234.54	219.20	794.15	-	15.64	96.00	13.44	287.08	282.10	135.90	-	-	-	34.97	(3.85)	861.28	1,606.98	48,179	1,315	59,835	44.6	
18	38	75.56	283.53	-	234.54	219.20	768.34	-	15.64	96.00	13.44	287.08	282.10	135.90	-	-	-	35.38	(3.85)	861.68	1,581.17	50,622	1,328	57,392	46.9	
19	39	75.56	283.53	-	234.54	219.20	743.04	-	15.64	96.00	13.44	287.08	282.10	135.90	-	-	-	35.78	(3.85)	862.08	1,555.86	53,040	1,341	54,974	49.1	
20	40	75.56	283.53	-	234.54	219.20	718.21	-	15.64	96.00	13.44	287.08	282.10	135.90	-	-	-	36.16	(3.85)	862.46	1,531.04	55,433	1,354	52,580	51.3	
21	41	75.56	283.53	-	234.54	219.20	693.83	-	15.64	96.00	13.44	287.08	282.10	135.90												

Table 4-27. Proposed East and West Pit Flooding Schedule - Low Flows for Mine Site Proposed Action

		Source of water to West Pit - LOW FLOWS FOR MINE SITE PROPOSED ACTION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										</	
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Table 4-28. Proposed East and West Pit Flooding Schedule - High Flows for Mine Site Proposed Action

		Source of water to West Pit - HIGH FLOWS FOR MINE SITE PROPOSED ACTION																								
Year after Mine Closure (Year 20)	Year from Start of Mine	Stormwater runoff from Cat. 1/2 Stockpile to West Pit (acre-feet)	Non-stockpile stormwater runoff within Mine Site to West Pit (acre-feet)	Liner Leakage from Overburden portion of Cat. 1/2 Stockpile to West Pit (acre-feet)	Liner Leakage from Wasterock portion of Cat. 1/2 Stockpile to West Pit (acre-feet)	Direct net precipitation over West Pit (acre-feet)	Groundwater inflow to West Pit (acre-feet)	Liner Leakage from Overburden portion of Cat. 1/2 Stockpile to East Pit (acre-feet)	Liner Leakage from Wasterock portion of Cat. 1/2 Stockpile to East Pit (acre-feet)	Stormwater runoff from Cat. 1/2 Stockpile to East Pit (acre-feet)	Stormwater runoff from Cat. 3 Stockpile to East Pit (acre-feet)	Non-stockpile stormwater runoff within Mine Site to East Pit (acre-feet)	Pumping from WWTF to East Pit (acre-feet) ¹	Direct net precipitation over North East Pit (acre-feet)	Direct net precipitation over Central Pit (acre-feet)	Groundwater inflow to Central Pit (acre-feet)	Groundwater outflow from Central Pit (acre-feet)	Groundwater inflow to East Pit (acre-feet)	Groundwater outflow from East Pit (acre-feet)	Incremental West Pit flooding volume via East Pit (acre-feet)	Incremental West Pit flooding volume directly to West Pit (acre-feet)	Cumulative West Pit flooded volume (acre-feet)	Water elevation in West Pit (ft-MSL)	Remaining storage capacity in West Pit (acre-feet)	Percent full of West Pit (%)	
NA	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	12	-	-	-	-	-	-	-	166.78	-	-	-	185.75	111.13	51.08	1.48	-	1,548.39	-	-	-	-	-	-	-	
NA	13	-	-	-	-	-	-	-	166.78	-	-	-	(830.13)	111.13	51.08	40.64	-	1,446.23	-	-	-	-	-	-	-	
NA	14	-	-	-	-	-	-	-	166.78	-	-	-	(1,038.11)	111.13	51.08	79.80	-	1,344.08	-	-	-	-	-	-	-	
NA	15	-	-	-	-	-	-	-	166.78	-	-	-	1,061.18	111.13	51.08	80.65	(0.00)	1,241.93	0.00	-	-	-	-	-	-	
NA	16	-	-	-	-	-	-	-	166.78	-	-	-	910.17	111.13	51.08	70.97	(3.23)	1,000.00	(41.94)	-	-	-	-	-	-	
NA	17	-	-	-	-	-	-	-	166.78	-	-	-	683.36	111.13	51.08	61.29	(6.45)	758.06	(83.87)	-	-	-	-	-	-	
NA	18	-	-	-	-	-	-	-	166.78	-	-	-	841.27	111.13	51.08	51.61	(9.68)	516.13	(125.81)	-	-	-	-	-	-	
NA	19	-	-	-	-	-	-	-	166.78	-	-	-	1,868.68	111.13	51.08	41.94	(12.90)	274.19	(167.74)	-	-	-	-	-	-	
NA	20	-	-	-	-	-	-	-	166.78	-	-	-	1,521.10	111.13	51.08	32.26	(16.13)	32.26	(209.68)	-	-	-	-	-	-	
1	21	136.60	283.53	-	625.42	219.20	1,307.00	-	41.69	173.56	15.55	287.08	450.44	135.90	-	-	-	33.44	(3.85)	1,133.81	2,571.75	3,706	938	104,308	3.4	
2	22	136.60	283.53	-	625.42	219.20	1,307.00	-	41.69	173.56	15.55	287.08	400.12	135.90	-	-	-	33.44	(3.85)	1,083.49	2,571.75	7,361	992	100,653	6.8	
3	23	136.60	283.53	-	625.42	219.20	1,261.08	-	41.69	173.56	15.55	287.08	358.69	135.90	-	-	-	33.44	(3.85)	1,042.07	2,525.84	10,929	1,035	97,085	10.1	
4	24	136.60	283.53	-	625.42	219.20	1,206.39	-	41.69	173.56	15.55	287.08	323.62	135.90	-	-	-	33.44	(3.85)	1,007.00	2,471.15	14,407	1,072	93,607	13.3	
5	25	136.60	283.53	-	625.42	219.20	1,157.60	-	41.69	173.56	15.55	287.08	293.09	135.90	-	-	-	33.44	(3.85)	976.47	2,422.35	17,806	1,105	90,208	16.5	
6	26	136.60	283.53	-	625.42	219.20	1,112.75	-	41.69	173.56	15.55	287.08	265.80	135.90	-	-	-	33.44	(3.85)	949.18	2,377.51	21,132	1,135	86,881	19.6	
7	27	136.60	283.53	-	625.42	219.20	1,070.84	-	41.69	173.56	15.55	287.08	240.83	135.90	-	-	-	33.44	(3.85)	924.20	2,335.59	24,392	1,162	83,621	22.6	
8	28	136.60	283.53	-	625.42	219.20	1,031.23	-	41.69	173.56	15.55	287.08	217.50	135.90	-	-	-	33.44	(3.85)	900.87	2,295.99	27,589	1,186	80,425	25.5	
9	29	136.60	283.53	-	625.42	219.20	993.53	-	41.69	173.56	15.55	287.08	195.36	135.90	-	-	-	33.44	(3.85)	878.73	2,258.29	30,726	1,208	77,288	28.4	
10	30	136.60	283.53	-	625.42	219.20	957.45	-	41.69	173.56	15.55	287.08	174.05	135.90	-	-	-	33.44	(3.85)	857.43	2,222.21	33,806	1,229	74,208	31.3	
11	31	136.60	283.53	-	625.42	219.20	922.78	-	41.69	173.56	15.55	287.08	153.35	135.90	-	-	-	33.44	(3.85)	836.72	2,187.53	36,830	1,248	71,184	34.1	
12	32	136.60	283.53	-	625.42	219.20	889.36	-	41.69	173.56	15.55	287.08	133.08	135.90	-	-	-	33.44	(3.85)	816.45	2,154.11	39,800	1,266	68,213	36.8	
13	33	136.60	283.53	-	625.42	219.20	857.06	-	41.69	173.56	15.55	287.08	113.11	135.90	-	-	-	33.95	(3.85)	797.00	2,121.81	42,719	1,284	65,294	39.5	
14	34	136.60	283.53	-	625.42	219.20	825.78	-	41.69	173.56	15.55	287.08	101.60	135.90	-	-	-	34.47	(3.85)	786.00	2,090.53	45,596	1,300	62,418	42.2	
15	35	136.60	283.53	-	625.42	219.20	795.35	-	41.69	173.56	15.55	287.08	101.60	135.90	-	-	-	34.96	(3.85)	786.49	2,060.11	48,442	1,316	59,571	44.8	
16	36	136.60	283.53	-	625.42	219.20	765.60	-	41.69	173.56	15.55	287.08	101.60	135.90	-	-	-	35.43	(3.85)	786.96	2,030.35	51,260	1,332	56,754	47.5	
17	37	136.60	283.53	-	625.42	219.20	736.46	-	41.69	173.56	15.55	287.08	101.60	135.90	-	-	-	35.88	(3.85)	787.41	2,001.22	54,048	1,347	53,965	50.0	
18	38	136.60	283.53	-	625.42	219.20	707.91	-	41.69	173.56	15.55	287.08	101.60	135.90	-	-	-	36.31	(3.85)	787.85	1,972.67	56,809	1,361	51,205	52.6	
19	39	136.60	283.53	-	625.42	219.20	679.91	-	41.69	173.56	15.55	287.08	101.60	135.90	-	-	-	36.68	(3.85)	788.22	1,944.66	59,542	1,374	48,472	55.1	
20	40	136.60	283.53	-	625.42	219.20	652.42	-	41.69	173.56	15.55	287.08	101.60	135.90	-	-	-	37.03	(3.85)	788.57	1,917.17	62,248	1,388	45,766	57.6	
21	41	136.60	283.53	-	625.42	219.20	625.41	-	41.69	173.56																

Table 4-29. High, Average and Low Estimates of Stockpile Stormwater Runoff for Pit Flooding Under Mine Site-Proposed Action

Stockpile	Contributing Area	Stormwater Yield (inches/year)		
		High	Average	Low
Category 1/2 Waste Rock-reclaimed with ET cover	316 acres to the East Pit	8	3	0
	248 acres to the West Pit	8	3	0
Category 3 Waste Rock-reclaimed with ET/geomembrane	17 acres to the East Pit	11.5	9.5	7.7

Table 4-30. Seepage and Liner Leakage Rates from Overburden Storage Area, Sumps, Process Water Ponds, and WWTF Equalization Ponds under Mine Site - Proposed Action

Mine Year	Seepage and Liner Leakage Rates (gpm)						
	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 15	Mine Year 20	Closure	Post-Closure
Overburden Storage and Laydown Area ¹	34.29	34.29	34.29	34.29	34.29	0	0
Category 1/2 Sumps ²	0.002083	0.002083	0.002083	0.002083	0.002083	0.002083	0.002083
Category 3 Sumps ³	0.000008	0.000008	0.000008	0.000008	0.000008	0.000008	0.000008
Category 3LO Sumps	0.000016	0.000016	0.000016	0.000016	0.000016	0.000016	0.000016
Category 4 Sumps	0.000007	0.000007	0.000007	0.000007	0.000007	0.000007	0.000007
Category 4LO Sumps	0.000014	0.000014	0.000014	0.000014	0.000014	0	0
PW-1 Overburden Runoff ¹	8.48	8.48	8.48	8.48	8.48	0	0
PW-7 Overburden Runoff ^{1,3}	15.93	15.93	0	0	0	0	0
PW-2 Haul Road Runoff	0.006028	0.006028	0.006028	0.006028	0.006028	0	0
PW-4 Haul Road Runoff	0.012917	0.012917	0.012917	0.012917	0.012917	0	0
PW-3 Rail Transfer Hopper	0.000004	0.000004	0.000004	0.000004	0.000004	0	0
WWTF Equalization Ponds ⁴	0	0.000400	0.013200	0.003400	0.001100	0	0

¹ No liner present.

² Only the southern-most sump of the Cat 1/2 pile (S-1) drains to Partridge (17% of the total leakage), others drain to pits

² PW-7 exists only in Year 1 and Year 5

⁴ Rates are averages over period during which water is in the pond (typically 8-30 days)

Table 4-31. WWTF Process Water Quality Targets

Parameter	Process Water Quality Target (µg/L, unless noted)	Standard	Class/Basis
Metals/Inorganics			
Aluminum	125	Surface Water	2B – Aquatic Life
Antimony	31	Surface Water	2B – Aquatic Life
Arsenic	10	Drinking Water	Primary/Human Health
Barium	2,000	Drinking Water	Primary/Human Health
Beryllium	4	Drinking Water	Primary/Human Health
Boron	500	Surface Water	4A – Irrigation
Cadmium	4	Ground Water	Human Health
Chromium (+3)	100	Ground Water	Human Health
Chromium (+6)	11	Surface Water	2B – Aquatic Life
Cobalt	5	Surface Water	2B – Aquatic Life
Copper	30	Surface Water	2B – Aquatic Life
Iron	300	Drinking Water	Secondary
Lead	19	Surface Water	2B – Aquatic Life
Manganese	50	Drinking Water	Secondary
Mercury	0.0013	Surface Water	2B – Aquatic Life
Molybdenum	100	Drinking Water	Secondary
Nickel	100	Ground Water	Human Health
Selenium	5	Surface Water	2B – Aquatic Life
Silver	1	Surface Water	2B – Aquatic Life
Thallium	0.56	Surface Water	2B – Human Health
Zinc	388	Surface Water	2B – Aquatic Life
General Parameters			
Ammonia (un-ionized)	40	Surface Water	2B – Aquatic Life
Bicarbonate (meq/L)	5	Surface Water	4A – Irrigation
Chloride (mg/L)	230	Surface Water	2B – Aquatic Life
Cyanide (free)	5.2	Surface Water	2B – Aquatic Life
Dissolved Oxygen (mg/L)	>5.0	Surface Water	2B – Aquatic Life
Fluoride (mg/L)	2	Drinking Water	Secondary
Hardness(mg/L)	250	Surface Water	3B – Industrial
Nitrate (mg/L)	10	Drinking Water	Primary
Oil	500	Surface Water	2B
pH (su)	6.0-9.0	Surface Water	2B
Sodium	60% of cations	Surface Water	4A – Irrigation
Specific Conductance (µmhos/cm)	1,000	Surface Water	4A – Irrigation
Sulfate (mg/L)	250	Drinking Water	Secondary
Total Dissolved Solids	700	Surface Water	4A – Irrigation
Total Salinity (mg/L)	1,000	Surface Water	4B – Livestock
Turbidity (NTU)	25	Surface Water	2B

Table 4-32. Wastewater Treatment Facility (WWTF) Equalization Pond Water Quality under Mine Site - Proposed Action

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	0.0027	0.0043	0.0043	0.0031	0.0053	--	--
Al	mg/L	2.55	16.3	38.7	53.9	33.9	--	--
As	mg/L	0.22	0.39	0.39	0.71	0.56	--	--
B	mg/L	0.5	0.92	0.88	1.07	1.1	--	--
Ba	mg/L	0.15	0.23	0.23	0.3	0.28	--	--
Be	mg/L	0.0018	0.002	0.0027	0.0027	0.0026	--	--
Ca	mg/L	179	396	375	622	541	--	--
Cd	mg/L	0.0069	0.0063	0.01	0.01	0.0073	--	--
Cl	mg/L	10.4	27.7	27.1	14.1	14.4	--	--
Co	mg/L	0.2	1.82	10.9	17.1	10.6	--	--
Cu	mg/L	0.097	0.34	11.4	27	39	--	--
F	mg/L	1.9	8.56	17.9	30.1	37.7	--	--
Fe	mg/L	29.4	74	82.4	106	92.2	--	--
Hardness	mg/L	629	1,565	2,740	4,083	2,825	--	--
K	mg/L	24.5	40.1	36.1	56.7	48.3	--	--
Mg	mg/L	44.6	141	438	615	359	--	--
Mn	mg/L	0.89	6.22	20.1	29.5	16.4	--	--
Na	mg/L	97	358	255	524	451	--	--
Ni	mg/L	2.99	26.4	138	254	176	--	--
Pb	mg/L	0.01	0.038	0.04	0.06	0.051	--	--
Sb	mg/L	0.055	0.076	0.082	0.124	0.109	--	--
Se	mg/L	0.0074	0.01	0.01	0.009	0.013	--	--
SO ₄	mg/L	791	2,914	5,026	7,276	5,020	--	--
Tl	mg/L	0.0044	0.0072	0.0072	0.0041	0.0088	--	--
V	mg/L	0.063	0.492	2.593	5.580	9.683	--	--
Zn	mg/L	2.21	7.82	12.3	14.8	10.3	--	--

¹ Pond is never filled after year 20

Table 4-33. High, Average and Low Estimates of Liner Yield for Different Stockpiles and Conditions under Mine Site-Reasonable Alternative 1

Stockpile	Condition	Liner Yield (inches/year)		
		High	Average	Low
Category 1 Waste Rock and Overburden	Active (not reclaimed)	20.4	14.2	8.2
	Closed (reclaimed w/ET cover)	14.7	10.2	4.7
Category 2/3 Waste Rock ¹	Active (not reclaimed)	20.4	14.2	8.2
	Closed when Cat 1 material is placed in stockpile (reclaimed with ET cover)	14.7	10.2	4.7
Category 3 Lean Ore ²	Active (not reclaimed)	20.4	14.2	8.2
	Closed when Cat 1 material is placed in stockpile (reclaimed with ET cover)	14.7	10.2	4.7
Category 4 Waste Rock	Active (not reclaimed - removed at end of Year 20)	20.4	14.2	8.2
Lean Ore Surge Pile	Active (not reclaimed - removed at end of Year 20)	20.4	14.2	8.2

¹ Becomes a Category 1 Waste Rock Stockpile in Year 19

² Becomes a Category 1 Waste Rock Stockpile in Year 15

Table 4-34. Stockpile Active and Reclaimed Areas under Mine Site-Reasonable Alternative 1

Stockpile	Stage	Area Active (acres)	Area Reclaimed (acres)	Total Area (acres)
Category 1 Waste Rock	Year 1	111.6	21.8	133.4
	Year 5	299.1	91.9	391.0
	Year 10	233.8	230.6	464.4
	Year 12	134.2	330.2	464.4
	Year 15	0.0	464.4	464.4
	Year 20	0.0	464.4	464.4
	Closure	0.0	464.4	464.4
	Post-Closure	0.0	464.4	464.4
Category 2/3 Waste Rock (Becomes Category 1 Waste Rock in Year 19)	Year 1	4.2	0.0	4.2
	Year 5	46.8	0.0	46.8
	Year 10	72.0	0.0	72.0
	Year 12	72.0	0.0	72.0
	Year 15	72.0	0.0	72.0
	Year 20	0.0	72.0	72.0
	Closure	0.0	72.0	72.0
	Post-Closure	0.0	72.0	72.0
Category 3 Lean Ore (Becomes Category 1 Waste Rock in Year 15)	Year 1	17.8	0.0	17.8
	Year 5	63.8	0.0	63.8
	Year 10	68.4	0.0	68.4
	Year 12	68.4	0.0	68.4
	Year 15	59.2	9.2	68.4
	Year 20	0.0	123.7	123.7
	Closure	0.0	123.7	123.7
	Post-Closure	0.0	123.7	123.7
Category 4 Waste Rock (removed at end of Year 20)	Year 1	2.3	0.0	2.3
	Year 5	40.0	0.0	40.0
	Year 10	63.3	0.0	63.3
	Year 12	63.3	0.0	63.3
	Year 15	27.6	0.0	27.6
	Year 20	27.6	0.0	27.6
Lean Ore Surge Pile (removed at end of Year 20)	Year 1	54.5	0.0	54.5
	Year 5	54.5	0.0	54.5
	Year 10	54.5	0.0	54.5
	Year 12	54.5	0.0	54.5
	Year 15	54.5	0.0	54.5
	Year 20	54.5	0.0	54.5

Table 4-35. Area Weighted Liner Yields under Reasonable Alternative 1

Stockpile	Area-Weighted Low Liner Yield (inches/year)							
	Year 1	Year 5	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure
Category 1 Waste Rock	7.7	7.5	6.0	5.5	4.7	4.7	4.7	4.7
Category 2/3 Waste Rock ¹	8.2	8.2	8.2	8.2	8.2	4.7	4.7	4.7
Category 3 Lean Ore ²	8.2	8.2	8.2	8.2	7.7	4.7	4.7	4.7
Category 4 Waste Rock ³	8.2	8.2	8.2	8.2	8.2	8.2	0	0
Lean Ore Surge Pile ³	8.2	8.2	8.2	8.2	8.2	8.2	0	0

Stockpile	Area-Weighted Average Liner Yield (inches/year)							
	Year 1	Year 5	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure
Category 1 Waste Rock	13.6	13.3	11.7	11.2	10.2	10.2	10.2	10.2
Category 2/3 Waste Rock ¹	14.2	14.2	14.2	14.2	14.2	10.2	10.2	10.2
Category 3 Lean Ore ²	14.2	14.2	14.2	14.2	13.7	10.2	10.2	10.2
Category 4 Waste Rock ³	14.2	14.2	14.2	14.2	14.2	14.2	0	0
Lean Ore Surge Pile ³	14.2	14.2	14.2	14.2	14.2	14.2	0	0

Stockpile	Area-Weighted High Liner Yield (inches/year)							
	Year 1	Year 5	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure
Category 1 Waste Rock	19.6	19.2	16.9	16.1	14.7	14.7	14.7	14.7
Category 2/3 Waste Rock ¹	20.4	20.4	20.4	20.4	20.4	14.7	14.7	14.7
Category 3 Lean Ore ²	20.4	20.4	20.4	20.4	19.6	14.7	14.7	14.7
Category 4 Waste Rock ³	20.4	20.4	20.4	20.4	20.4	20.4	0	0
Lean Ore Surge Pile ³	20.4	20.4	20.4	20.4	20.4	20.4	0	0

¹ Becomes Category 1 Waste Rock stockpile in Year 19

² Becomes Category 1 Waste Rock stockpile in Year 15

³ Removed at end of Year 20

Table 4-36. Ranges of Conditions for HELP Modeling of Low, Average and High Liner Leakage Rates for Different Stockpiles and Conditions Under Mine Site-Reasonable Alternative 1

Stockpile	Condition	Parameter	Liner Leakage Rate		
			High	Average	Low
Category 1 Waste Rock and Overburden	Active	Parameters	Range of slope of overliner in liner system	0.20%	0.2% - 0.5%
			Range of permeability of soil liner in liner system (cm/s)	5.00E-06	1.00E-07 - 5.00E-06
			Liner yield (inches/year)	20.4	14.2
	Reclaimed with soil-ET cover	Results	Range of Liner Leakage Rate (gallons/acre/day)	1,496	95 - 1,050
			Range of slope of overliner in liner system	0.20%	0.2% - 0.5%
			Range of permeability of soil liner in liner system (cm/s)	5.00E-06	1.00E-07 - 5.00E-06
Category 2/3 Waste Rock (becomes Category 1 Waste Rock in Year 19)	Active	Parameters	Liner yield (inches/year)	14.7	10.2
			Range of Liner Leakage Rate (gallons/acre/day)	1,088	92 - 756
			Range of slope of overliner in liner system	0.50%	0.50% - 2.00%
			Range in permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-07 - 1.00E-05
	Reclaimed with soil-ET cover	Parameters	Range in number of geomembrane installation defects per acre	8	1 - 8
			Liner yield (inches/year)	20.4	14.2
			Range of Liner Leakage Rate (gallons/acre/day)	2.5443	0.0030 - 1.8301
			Range of slope of overliner in liner system	0.50%	0.50% - 2.00%
			Range in permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-07 - 1.00E-05
			Range in number of geomembrane installation defects per acre	8	1 - 8
Category 3 Lean Ore (becomes Category 1 Waste Rock in Year 15)	Active	Parameters	Liner yield (inches/year)	14.7	10.2
			Range of Liner Leakage Rate (gallons/acre/day)	1.8896	0.0022 - 1.3614
			Range of slope of overliner in liner system	0.50%	0.50% - 2.00%
			Range in permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-07 - 1.00E-05
	Reclaimed with soil-ET cover	Parameters	Range in number of geomembrane installation defects per acre	8	1 - 8
			Liner yield (inches/year)	20.4	14.2
			Range of Liner Leakage Rate (gallons/acre/day)	2.5443	0.0030 - 1.8301
			Range of slope of overliner in liner system	0.50%	0.50% - 2.00%
			Range in permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-07 - 1.00E-05
			Range in number of geomembrane installation defects per acre	8	1 - 8
Category 4 Waste Rock	Active	Parameters	Liner yield (inches/year)	14.7	10.2
			Range of Liner Leakage Rate (gallons/acre/day)	1.8896	0.0022 - 1.3614
			Range of slope of overliner in liner system	0.50%	0.50% - 2.00%
			Range in permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-07 - 1.00E-05
		Results	Range in number of geomembrane installation defects per acre	8	1 - 8
Lean Ore Surge Pile	Active	Parameters	Liner yield (inches/year)	20.4	14.2
			Range of Liner Leakage Rate (gallons/acre/day)	2.5443	0.0030 - 1.8301
			Range of slope of overliner in liner system	0.50%	0.50% - 2.00%
			Range in permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-07 - 1.00E-05
		Results	Range in number of geomembrane installation defects per acre	8	1 - 8

Table 4-37. Conditions for Modeling of Low, Average and High Liner Leakage Rates for Different Stockpiles and Conditions under Reasonable Alternative 1

Stockpile	Condition		Parameter	Liner Leakage Rate		
				High	Average	Low
Category 1 Waste Rock and Overburden	Active	Parameters	Slope of overliner in liner system	0.20%	0.50%	0.50%
			Permeability of soil liner in liner system (cm/s)	5.00E-06	5.00E-07	5.00E-07
			Liner yield (inches/year)	20.4	14.2	8.2
			Liner Leakage Rate (gallons/acre/day)	1,496	426	377
	Reclaimed with soil-ET cover	Parameters	Slope of overliner in liner system	0.20%	0.50%	0.50%
			Permeability of soil liner in liner system (cm/s)	5.00E-06	5.00E-07	5.00E-07
			Liner yield (inches/year)	14.7	10.2	4.7
			Liner Leakage Rate (gallons/acre/day)	1,088	408	297
Category 2/3 Waste Rock (becomes Category 1 Waste Rock in Year 19)	Active	Parameters	Slope of overliner in liner system	0.50%	1.00%	1.00%
			Permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-05	1.00E-05
			Number of geomembrane installation defects per acre	8	4	4
			Liner yield (inches/year)	20.4	14.2	8.2
			Liner Leakage Rate (gallons/acre/day)	2.5443	0.4895	0.2976
	Reclaimed with soil-ET cover	Parameters	Slope of overliner in liner system	0.50%	1.00%	1.00%
			Permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-05	1.00E-05
			Number of geomembrane installation defects per acre	8	4	4
			Liner yield (inches/year)	14.7	10.2	4.7
			Liner Leakage Rate (gallons/acre/day)	1.8896	0.3630	0.1800
Category 3 Lean Ore (becomes Category 1 Waste Rock in Year 15)	Active	Parameters	Slope of overliner in liner system	0.50%	1.00%	1.00%
			Permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-06	1.00E-06
			Number of geomembrane installation defects per acre	8	4	4
			Liner yield (inches/year)	20.4	14.2	8.2
			Liner Leakage Rate (gallons/acre/day)	2.5443	0.0900	0.0551
	Reclaimed with soil-ET cover	Parameters	Slope of overliner in liner system	0.50%	1.00%	1.00%
			Permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-06	1.00E-06
			Number of geomembrane installation defects per acre	8	4	4
			Liner yield (inches/year)	14.7	10.2	4.7
			Liner Leakage Rate (gallons/acre/day)	1.8896	0.6700	0.0335
Category 4 Waste Rock	Active	Parameters	Slope of overliner in liner system	0.50%	1.00%	1.00%
			Permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-06	1.00E-06
			Number of geomembrane installation defects per acre	8	4	4
			Liner yield (inches/year)	20.4	14.2	8.2
			Liner Leakage Rate (gallons/acre/day)	2.5443	0.0900	0.0551
Lean Ore Surge Pile	Active	Parameters	Slope of overliner in liner system	0.50%	1.00%	1.00%
			Permeability of subgrade material layer in liner system (cm/s)	1.00E-05	1.00E-06	1.00E-06
			Number of geomembrane installation defects per acre	8	4	4
			Liner yield (inches/year)	20.4	14.2	8.2
			Liner Leakage Rate (gallons/acre/day)	2.5443	0.0900	0.0551

Table 4-38. Stockpile Liner Leakage Rates under Reasonable Alternative 1

Stockpile	Low Liner Leakage Rate (gpm)							
	Year 1	Year 5	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure
Category 1 Waste Rock	43.9	121.8	129.2	123.7	116.2	116.2	116.2	116.2
Category 1 Overburden Areas	10.2	24.6	20.5	20.5	20.5	20.5	20.5	20.5
Category 2/3 Waste Rock ¹	0.000865	0.009679	0.014870	0.014870	0.014870	0.008996	0.008996	0.008996
Category 3 Lean Ore ²	0.000681	0.002438	0.002617	0.002617	0.002479	0.002876	0.002876	0.002876
Category 4 Waste Rock ³	0.000088	0.001529	0.002421	0.002421	0.001053	0.001053	0	0
Lean Ore Surge Pile ³	0.002085	0.002085	0.002085	0.002085	0.002085	0.002085	0	0

Stockpile	Average Liner Leakage Rate (gpm)							
	Year 1	Year 5	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure
Category 1 Waste Rock	50.9	143.0	162.7	161.4	159.7	159.7	159.7	159.7
Category 1 Overburden Areas	11.7	28.4	28.1	28.1	28.1	28.1	28.1	28.1
Category 2/3 Waste Rock ¹	0.001423	0.015921	0.024461	0.024461	0.024461	0.018141	0.018141	0.018141
Category 3 Lean Ore ²	0.001113	0.003986	0.004279	0.004279	0.004131	0.005751	0.005751	0.005751
Category 4 Waste Rock ³	0.000144	0.002500	0.003959	0.003959	0.001722	0.001722	0	0
Lean Ore Surge Pile ³	0.003409	0.003409	0.003409	0.003409	0.003409	0.003409	0	0

Stockpile	High Liner Leakage Rate (gpm)							
	Year 1	Year 5	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure
Category 1 Waste Rock	172.7	476.9	492.1	463.9	425.9	425.9	425.9	425.9
Category 1 Overburden Areas	40.4	96.9	75.1	75.1	75.1	75.1	75.1	75.1
Category 2/3 Waste Rock ¹	0.007398	0.082752	0.127139	0.127139	0.127139	0.094425	0.094425	0.094425
Category 3 Lean Ore ²	0.031458	0.112668	0.120934	0.120934	0.116746	0.162310	0.162310	0.162310
Category 4 Waste Rock ³	0.004081	0.070668	0.111889	0.111889	0.048685	0.048685	0	0
Lean Ore Surge Pile ³	0.096348	0.096348	0.096348	0.096348	0.096348	0.096348	0	0

¹ Becomes Category 1 Waste Rock Stockpile in Year 19

² Becomes Category 1 Waste Rock Stockpile in Year 15

³ Removed at end of Year 20

Table 4-39. Parameter Concentrations in Leachate from Category 1 Waste Rock Stockpile under Reasonable Alternative 1 (Low Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 12	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04
Al	mg/L	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00
As	mg/L	2.94E-02	1.19E-01	2.53E-01	4.85E-01	4.85E-01	4.85E-01	4.85E-01	4.85E-01
B	mg/L	1.10E-01	4.44E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01
Ba	mg/L	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01
Be	mg/L	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04
Ca	mg/L	1.52E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02
Cd	mg/L	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04
Cl	mg/L	2.92E+01	1.08E+02	1.36E+02	1.36E+02	8.34E+01	0.00E+00	0.00E+00	0.00E+00
Co	mg/L	4.45E-03	1.80E-02	3.84E-02	5.20E-02	5.20E-02	5.20E-02	5.20E-02	5.20E-02
Cu	mg/L	7.33E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02
F	mg/L	6.28E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02
Fe	mg/L	5.74E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01
Hardness	mg/L	4.97E+02	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03
K	mg/L	3.28E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01
Mg	mg/L	2.84E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01
Mn	mg/L	6.72E-02	2.71E-01	5.80E-01	7.50E-01	7.50E-01	7.50E-01	7.50E-01	7.50E-01
Na	mg/L	4.59E+01	1.85E+02	3.96E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02
Ni	mg/L	2.90E-02	1.17E-01	2.50E-01	4.79E-01	4.79E-01	4.79E-01	4.79E-01	4.79E-01
Pb	mg/L	3.47E-03	1.40E-02	2.99E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02
Sb	mg/L	2.00E-01	2.00E-01	2.00E-01	2.00E-01	2.00E-01	2.00E-01	2.00E-01	2.00E-01
Se	mg/L	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02
SO ₄	mg/L	1.12E+02	4.53E+02	9.68E+02	1.85E+03	1.85E+03	1.85E+03	1.85E+03	1.85E+03
Tl	mg/L	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05
V	mg/L	1.73E-02	6.98E-02	1.49E-01	2.86E-01	2.86E-01	2.86E-01	2.86E-01	2.86E-01
Zn	mg/L	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02

¹ Values from Year 30

Table 4-40. Parameter Concentrations in Leachate from Category 1 Waste Rock Stockpile under Reasonable Alternative 1 (Average Liner Yield

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 12	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04
Al	mg/L	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00
As	mg/L	1.65E-02	6.60E-02	1.33E-01	2.24E-01	2.24E-01	2.24E-01	2.24E-01	2.24E-01
B	mg/L	6.19E-02	2.47E-01	4.97E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01
Ba	mg/L	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01
Be	mg/L	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04
Ca	mg/L	8.59E+01	3.42E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02
Cd	mg/L	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04
Cl	mg/L	1.64E+01	5.99E+01	7.14E+01	7.14E+01	3.84E+01	0.00E+00	0.00E+00	0.00E+00
Co	mg/L	2.51E-03	9.99E-03	2.01E-02	3.39E-02	3.39E-02	3.39E-02	3.39E-02	3.39E-02
Cu	mg/L	4.13E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02
F	mg/L	6.29E-02	6.24E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02
Fe	mg/L	3.23E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01
Hardness	mg/L	2.80E+02	1.12E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03
K	mg/L	1.85E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01
Mg	mg/L	1.60E+01	6.37E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01
Mn	mg/L	3.78E-02	1.51E-01	3.04E-01	5.11E-01	5.11E-01	5.11E-01	5.11E-01	5.11E-01
Na	mg/L	2.58E+01	1.03E+02	2.07E+02	3.49E+02	3.49E+02	3.49E+02	3.49E+02	3.49E+02
Ni	mg/L	1.63E-02	6.51E-02	1.31E-01	2.21E-01	2.21E-01	2.21E-01	2.21E-01	2.21E-01
Pb	mg/L	1.95E-03	7.79E-03	1.57E-02	2.64E-02	2.64E-02	2.64E-02	2.64E-02	2.64E-02
Sb	mg/L	7.04E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02
Se	mg/L	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03
SO ₄	mg/L	6.32E+01	2.52E+02	5.07E+02	8.54E+02	8.54E+02	8.54E+02	8.54E+02	8.54E+02
Tl	mg/L	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05
V	mg/L	9.74E-03	3.89E-02	7.82E-02	1.32E-01	1.32E-01	1.32E-01	1.32E-01	1.32E-01
Zn	mg/L	5.71E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02

¹ Values from Year 30

Table 4-41. Parameter Concentrations in Leachate from Category 1 Waste Rock Stockpile under Reasonable Alternative 1 (High Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 12	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04
Al	mg/L	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00
As	mg/L	1.15E-02	4.59E-02	9.23E-02	1.55E-01	1.55E-01	1.55E-01	1.55E-01	1.55E-01
B	mg/L	4.31E-02	1.72E-01	3.46E-01	5.81E-01	5.81E-01	5.81E-01	5.81E-01	5.81E-01
Ba	mg/L	1.83E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01
Be	mg/L	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04
Ca	mg/L	5.97E+01	2.38E+02	4.79E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02
Cd	mg/L	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04
Cl	mg/L	1.14E+01	4.16E+01	4.97E+01	4.97E+01	2.67E+01	0.00E+00	0.00E+00	0.00E+00
Co	mg/L	1.74E-03	6.95E-03	1.40E-02	2.35E-02	2.35E-02	2.35E-02	2.35E-02	2.35E-02
Cu	mg/L	2.87E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02
F	mg/L	6.30E-02	6.26E-02	6.22E-02	6.22E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02
Fe	mg/L	2.25E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01
Hardness	mg/L	1.95E+02	7.76E+02	1.56E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03
K	mg/L	1.28E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01
Mg	mg/L	1.11E+01	4.43E+01	8.91E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01
Mn	mg/L	2.63E-02	1.05E-01	2.11E-01	3.55E-01	3.55E-01	3.55E-01	3.55E-01	3.55E-01
Na	mg/L	1.80E+01	7.17E+01	1.44E+02	2.42E+02	2.42E+02	2.42E+02	2.42E+02	2.42E+02
Ni	mg/L	1.14E-02	4.53E-02	9.10E-02	1.53E-01	1.53E-01	1.53E-01	1.53E-01	1.53E-01
Pb	mg/L	1.36E-03	5.42E-03	1.09E-02	1.83E-02	1.83E-02	1.83E-02	1.83E-02	1.83E-02
Sb	mg/L	4.90E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02
Se	mg/L	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03
SO ₄	mg/L	4.40E+01	1.75E+02	3.53E+02	5.93E+02	5.93E+02	5.93E+02	5.93E+02	5.93E+02
Tl	mg/L	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05
V	mg/L	6.78E-03	2.70E-02	5.43E-02	9.14E-02	9.14E-02	9.14E-02	9.14E-02	9.14E-02
Zn	mg/L	3.98E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02

¹ Values from Year 30

Table 4-42. Parameter Concentrations in Leachate from Category 2/3 Waste Rock Stockpile under Reasonable Alternative 1 (Low Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 12	Mine Year 15	Mine Year 20	Closure ¹	Post- closure ¹
Ag	mg/L	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04
Al	mg/L	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00
As	mg/L	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.07E-01	7.07E-01	7.07E-01
B	mg/L	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01
Ba	mg/L	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01
Be	mg/L	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04
Ca	mg/L	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02
Cd	mg/L	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04
Cl	mg/L	4.59E+01	8.27E+01	8.36E+01	8.36E+01	0.00E+00	2.11E+02	0.00E+00	0.00E+00
Co	mg/L	5.20E-02	5.20E-02	5.20E-02	5.20E-02	5.20E-02	5.20E-02	5.20E-02	5.20E-02
Cu	mg/L	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02
F	mg/L	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02
Fe	mg/L	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01
Hardness	mg/L	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03
K	mg/L	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01
Mg	mg/L	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01
Mn	mg/L	7.50E-01	7.50E-01	7.50E-01	7.50E-01	7.50E-01	7.50E-01	7.50E-01	7.50E-01
Na	mg/L	3.70E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02
Ni	mg/L	8.60E-01	8.60E-01	8.60E-01	8.60E-01	8.60E-01	6.98E-01	6.97E-01	6.97E-01
Pb	mg/L	1.36E-02	2.57E-02	4.14E-02	4.14E-02	4.14E-02	5.28E-02	5.28E-02	5.28E-02
Sb	mg/L	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02
Se	mg/L	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03
SO ₄	mg/L	2.18E+03	2.34E+03	2.34E+03	2.34E+03	2.34E+03	2.34E+03	2.34E+03	2.34E+03
Tl	mg/L	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05
V	mg/L	6.60E-01	1.25E+00	2.01E+00	2.01E+00	2.01E+00	4.16E-01	4.16E-01	4.16E-01
Zn	mg/L	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02

¹ Values from Year 30

Table 4-43. Parameter Concentrations in Leachate from Category 2/3 Waste Rock Stockpile under Reasonable Alternative 1 (Average Liner Yield

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 12	Mine Year 15	Mine Year 20	Closure ¹	Post- closure ¹
Ag	mg/L	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04
Al	mg/L	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00
As	mg/L	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	3.26E-01	3.26E-01	3.26E-01
B	mg/L	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01
Ba	mg/L	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01
Be	mg/L	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04
Ca	mg/L	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02
Cd	mg/L	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04
Cl	mg/L	2.65E+01	4.77E+01	4.83E+01	4.83E+01	0.00E+00	9.72E+01	0.00E+00	0.00E+00
Co	mg/L	5.20E-02	5.20E-02	5.20E-02	5.20E-02	5.20E-02	4.94E-02	4.93E-02	4.93E-02
Cu	mg/L	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02
F	mg/L	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02
Fe	mg/L	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01
Hardness	mg/L	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03
K	mg/L	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01
Mg	mg/L	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01
Mn	mg/L	7.50E-01	7.50E-01	7.50E-01	7.50E-01	7.50E-01	7.45E-01	7.45E-01	7.45E-01
Na	mg/L	2.14E+02	4.04E+02	6.52E+02	6.52E+02	6.52E+02	5.09E+02	5.09E+02	5.09E+02
Ni	mg/L	8.60E-01	8.60E-01	8.60E-01	8.60E-01	8.60E-01	3.21E-01	3.21E-01	3.21E-01
Pb	mg/L	7.85E-03	1.48E-02	2.39E-02	2.39E-02	2.39E-02	3.85E-02	3.85E-02	3.85E-02
Sb	mg/L	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02
Se	mg/L	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03
SO ₄	mg/L	1.26E+03	2.34E+03	2.34E+03	2.34E+03	2.34E+03	1.24E+03	1.24E+03	1.24E+03
Tl	mg/L	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05
V	mg/L	3.81E-01	7.20E-01	1.16E+00	1.16E+00	1.16E+00	1.92E-01	1.92E-01	1.92E-01
Zn	mg/L	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02

¹ Values from Year 30

Table 4-44. Parameter Concentrations in Leachate from Category 2/3 Waste Rock Stockpile under Reasonable Alternative 1 (High Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 12	Mine Year 15	Mine Year 20	Closure ¹	Post- closure ¹
Ag	mg/L	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04
Al	mg/L	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00
As	mg/L	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	2.26E-01	2.26E-01	2.26E-01
B	mg/L	5.70E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01
Ba	mg/L	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01
Be	mg/L	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04
Ca	mg/L	4.67E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02
Cd	mg/L	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04
Cl	mg/L	1.85E+01	3.32E+01	3.36E+01	3.36E+01	0.00E+00	6.74E+01	0.00E+00	0.00E+00
Co	mg/L	5.20E-02	5.20E-02	5.20E-02	5.20E-02	5.20E-02	3.43E-02	3.42E-02	3.42E-02
Cu	mg/L	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02
F	mg/L	6.22E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02
Fe	mg/L	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01
Hardness	mg/L	1.55E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03
K	mg/L	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01
Mg	mg/L	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01
Mn	mg/L	7.50E-01	7.50E-01	7.50E-01	7.50E-01	7.50E-01	5.17E-01	5.17E-01	5.17E-01
Na	mg/L	1.49E+02	2.81E+02	4.54E+02	4.54E+02	4.54E+02	3.53E+02	3.53E+02	3.53E+02
Ni	mg/L	8.60E-01	8.60E-01	8.60E-01	8.60E-01	8.60E-01	2.23E-01	2.23E-01	2.23E-01
Pb	mg/L	5.46E-03	1.03E-02	1.67E-02	1.67E-02	1.67E-02	2.67E-02	2.67E-02	2.67E-02
Sb	mg/L	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02
Se	mg/L	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03
SO ₄	mg/L	8.78E+02	1.66E+03	2.34E+03	2.34E+03	2.34E+03	8.64E+02	8.63E+02	8.63E+02
Tl	mg/L	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05
V	mg/L	2.65E-01	5.01E-01	8.09E-01	8.09E-01	8.09E-01	1.33E-01	1.33E-01	1.33E-01
Zn	mg/L	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02

¹ Values from Year 30

Table 4-45. Parameter Concentrations in Leachate from Category 3 Lean Ore Stockpile under Reasonable Alternative 1 (Low Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 12	Mine Year 15	Mine Year 20	Closure ¹	Post- closure ¹
Ag	mg/L	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04
Al	mg/L	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00
As	mg/L	7.10E-01	7.10E-01	7.10E-01	7.10E-01	2.39E-01	7.10E-01	7.10E-01	7.10E-01
B	mg/L	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01
Ba	mg/L	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01
Be	mg/L	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04
Ca	mg/L	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02
Cd	mg/L	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04
Cl	mg/L	6.16E+01	7.17E+01	7.98E+01	7.98E+01	7.12E+01	2.13E+02	0.00E+00	0.00E+00
Co	mg/L	5.20E-02	5.20E-02	5.20E-02	5.20E-02	3.62E-02	5.20E-02	5.20E-02	5.20E-02
Cu	mg/L	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02
F	mg/L	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02
Fe	mg/L	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01
Hardness	mg/L	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03
K	mg/L	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01
Mg	mg/L	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01
Mn	mg/L	7.50E-01	7.50E-01	7.50E-01	7.50E-01	5.46E-01	7.50E-01	7.50E-01	7.50E-01
Na	mg/L	4.96E+02	6.81E+02	6.81E+02	6.81E+02	3.73E+02	6.81E+02	6.81E+02	6.81E+02
Ni	mg/L	8.60E-01	8.60E-01	8.60E-01	8.60E-01	2.36E-01	8.60E-01	8.60E-01	8.60E-01
Pb	mg/L	1.82E-02	2.63E-02	4.81E-02	4.81E-02	2.82E-02	5.28E-02	5.28E-02	5.28E-02
Sb	mg/L	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02
Se	mg/L	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03
SO ₄	mg/L	2.34E+03	2.34E+03	2.34E+03	2.34E+03	9.12E+02	2.34E+03	2.34E+03	2.34E+03
Tl	mg/L	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05
V	mg/L	8.85E-01	1.28E+00	2.34E+00	2.34E+00	1.41E-01	5.49E-01	5.49E-01	5.49E-01
Zn	mg/L	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02

¹ Values from Year 30

Table 4-46. Parameter Concentrations in Leachate from Category 3 Lean Ore Stockpile under Reasonable Alternative 1 (Average Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 12	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04
Al	mg/L	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00
As	mg/L	7.10E-01	7.10E-01	7.10E-01	7.10E-01	1.35E-01	4.30E-01	4.30E-01	4.30E-01
B	mg/L	7.60E-01	7.60E-01	7.60E-01	7.60E-01	5.06E-01	7.60E-01	7.60E-01	7.60E-01
Ba	mg/L	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01
Be	mg/L	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04
Ca	mg/L	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02
Cd	mg/L	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04
Cl	mg/L	3.56E+01	4.14E+01	4.61E+01	4.61E+01	4.03E+01	9.84E+01	0.00E+00	0.00E+00
Co	mg/L	5.20E-02	5.20E-02	5.20E-02	5.20E-02	2.05E-02	5.20E-02	5.20E-02	5.20E-02
Cu	mg/L	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02
F	mg/L	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02
Fe	mg/L	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01
Hardness	mg/L	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03
K	mg/L	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01
Mg	mg/L	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01
Mn	mg/L	7.50E-01	7.50E-01	7.50E-01	7.50E-01	3.09E-01	7.50E-01	7.50E-01	7.50E-01
Na	mg/L	2.86E+02	4.14E+02	6.81E+02	6.81E+02	2.11E+02	6.72E+02	6.72E+02	6.72E+02
Ni	mg/L	8.60E-01	8.60E-01	8.60E-01	8.60E-01	1.33E-01	4.24E-01	4.24E-01	4.24E-01
Pb	mg/L	1.05E-02	1.52E-02	2.78E-02	2.78E-02	1.60E-02	5.08E-02	5.08E-02	5.08E-02
Sb	mg/L	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02
Se	mg/L	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03
SO ₄	mg/L	1.69E+03	2.34E+03	2.34E+03	2.34E+03	5.16E+02	1.64E+03	1.64E+03	1.64E+03
Tl	mg/L	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05
V	mg/L	5.11E-01	7.38E-01	1.35E+00	1.35E+00	7.96E-02	2.53E-01	2.53E-01	2.53E-01
Zn	mg/L	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02

¹ Values from Year 30

Table 4-47. Parameter Concentrations in Leachate from Category 3 Lean Ore Stockpile under Reasonable Alternative 1 (High Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 12	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04
Al	mg/L	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00
As	mg/L	7.10E-01	7.10E-01	7.10E-01	7.10E-01	9.40E-02	2.98E-01	2.98E-01	2.98E-01
B	mg/L	7.60E-01	7.60E-01	7.60E-01	7.60E-01	3.52E-01	7.60E-01	7.60E-01	7.60E-01
Ba	mg/L	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01
Be	mg/L	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04
Ca	mg/L	5.40E+02	5.40E+02	5.40E+02	5.40E+02	4.88E+02	5.40E+02	5.40E+02	5.40E+02
Cd	mg/L	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04
Cl	mg/L	2.48E+01	2.88E+01	3.21E+01	3.21E+01	2.80E+01	6.83E+01	0.00E+00	0.00E+00
Co	mg/L	5.20E-02	5.20E-02	5.20E-02	5.20E-02	1.42E-02	4.52E-02	4.52E-02	4.52E-02
Cu	mg/L	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02
F	mg/L	6.21E-02	6.21E-02	6.21E-02	6.22E-02	6.22E-02	6.21E-02	6.21E-02	6.21E-02
Fe	mg/L	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01
Hardness	mg/L	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.59E+03	1.73E+03	1.73E+03	1.73E+03
K	mg/L	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01
Mg	mg/L	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.08E+01	9.30E+01	9.30E+01	9.30E+01
Mn	mg/L	7.50E-01	7.50E-01	7.50E-01	7.50E-01	2.15E-01	6.82E-01	6.82E-01	6.82E-01
Na	mg/L	1.99E+02	2.88E+02	5.27E+02	5.27E+02	1.47E+02	4.66E+02	4.66E+02	4.66E+02
Ni	mg/L	8.60E-01	8.60E-01	8.60E-01	8.60E-01	9.27E-02	2.94E-01	2.94E-01	2.94E-01
Pb	mg/L	7.32E-03	1.06E-02	1.93E-02	1.93E-02	1.11E-02	3.52E-02	3.52E-02	3.52E-02
Sb	mg/L	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02
Se	mg/L	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03
SO ₄	mg/L	1.18E+03	1.70E+03	2.34E+03	2.34E+03	3.59E+02	1.14E+03	1.14E+03	1.14E+03
Tl	mg/L	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05
V	mg/L	3.56E-01	5.14E-01	9.40E-01	9.40E-01	5.54E-02	1.76E-01	1.76E-01	1.76E-01
Zn	mg/L	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02

¹ Values from Year 30

Table 4-48. Parameter Concentrations in Leachate from Category 4 Waste Rock Stockpile under Reasonable Alternative 1 (Low Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 12	Mine Year 15	Mine Year 20	Closure ¹	Post- closure ¹
Ag	mg/L	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	--	--
Al	mg/L	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	--	--
As	mg/L	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	--	--
B	mg/L	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	--	--
Ba	mg/L	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	--	--
Be	mg/L	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	--	--
Ca	mg/L	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	--	--
Cd	mg/L	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	--	--
Cl	mg/L	1.99E+01	1.58E+01	5.66E+00	5.66E+00	5.87E-01	1.33E+00	--	--
Co	mg/L	5.20E-02	5.20E-02	5.20E-02	5.20E-02	5.20E-02	5.20E-02	--	--
Cu	mg/L	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	--	--
F	mg/L	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	--	--
Fe	mg/L	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	--	--
Hardness	mg/L	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	--	--
K	mg/L	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	--	--
Mg	mg/L	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	--	--
Mn	mg/L	7.50E-01	7.50E-01	7.50E-01	7.50E-01	7.50E-01	7.50E-01	--	--
Na	mg/L	2.01E+02	4.07E+02	6.79E+02	6.81E+02	6.81E+02	6.81E+02	--	--
Ni	mg/L	8.60E-01	8.60E-01	8.60E-01	8.60E-01	8.60E-01	8.60E-01	--	--
Pb	mg/L	2.83E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02	--	--
Sb	mg/L	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	--	--
Se	mg/L	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	--	--
SO ₄	mg/L	2.34E+03	2.34E+03	2.34E+03	2.34E+03	2.34E+03	2.34E+03	--	--
Tl	mg/L	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	--	--
V	mg/L	7.89E-02	1.60E-01	2.67E-01	7.40E-01	7.40E-01	7.72E-01	--	--
Zn	mg/L	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	--	--

¹ Stockpile removed at end of year 20

Table 4-49. Parameter Concentrations in Leachate from Category 4 Waste Rock Stockpile under Reasonable Alternative 1 (Average Liner Yield

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 12	Mine Year 15	Mine Year 20	Closure ¹	Post- closure ¹
Ag	mg/L	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	--	--
Al	mg/L	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	--	--
As	mg/L	4.44E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	--	--
B	mg/L	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	--	--
Ba	mg/L	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	--	--
Be	mg/L	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	--	--
Ca	mg/L	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	--	--
Cd	mg/L	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	--	--
Cl	mg/L	1.15E+01	9.13E+00	3.27E+00	3.27E+00	3.39E-01	7.66E-01	--	--
Co	mg/L	5.20E-02	5.20E-02	5.20E-02	5.20E-02	5.20E-02	5.20E-02	--	--
Cu	mg/L	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	--	--
F	mg/L	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	--	--
Fe	mg/L	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	--	--
Hardness	mg/L	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	--	--
K	mg/L	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	--	--
Mg	mg/L	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	--	--
Mn	mg/L	7.50E-01	7.50E-01	7.50E-01	7.50E-01	7.50E-01	7.50E-01	--	--
Na	mg/L	1.16E+02	2.35E+02	3.92E+02	6.81E+02	6.81E+02	6.81E+02	--	--
Ni	mg/L	8.60E-01	8.60E-01	8.60E-01	8.60E-01	8.60E-01	8.60E-01	--	--
Pb	mg/L	1.63E-02	3.30E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02	--	--
Sb	mg/L	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	--	--
Se	mg/L	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	--	--
SO ₄	mg/L	2.34E+03	2.34E+03	2.34E+03	2.34E+03	2.34E+03	2.34E+03	--	--
Tl	mg/L	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	--	--
V	mg/L	4.56E-02	9.23E-02	1.54E-01	4.27E-01	4.27E-01	4.46E-01	--	--
Zn	mg/L	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	--	--

¹ Stockpile removed at end of year 20

Table 4-50. Parameter Concentrations in Leachate from Category 4 Waste Rock Stockpile under Reasonable Alternative 1 (High Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 12	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	--	--
Al	mg/L	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	1.68E+00	--	--
As	mg/L	3.09E-01	6.26E-01	7.10E-01	7.10E-01	7.10E-01	7.10E-01	--	--
B	mg/L	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	--	--
Ba	mg/L	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	--	--
Be	mg/L	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	--	--
Ca	mg/L	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	5.40E+02	--	--
Cd	mg/L	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	1.80E-04	--	--
Cl	mg/L	8.00E+00	6.36E+00	2.28E+00	2.28E+00	2.36E-01	5.33E-01	--	--
Co	mg/L	5.20E-02	5.20E-02	5.20E-02	5.20E-02	5.20E-02	5.20E-02	--	--
Cu	mg/L	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	9.20E-02	--	--
F	mg/L	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	6.21E-02	--	--
Fe	mg/L	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	8.10E-01	--	--
Hardness	mg/L	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	1.73E+03	--	--
K	mg/L	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	4.90E+01	--	--
Mg	mg/L	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	9.30E+01	--	--
Mn	mg/L	7.50E-01	7.50E-01	7.50E-01	7.50E-01	7.50E-01	7.50E-01	--	--
Na	mg/L	8.09E+01	1.64E+02	2.73E+02	6.81E+02	6.81E+02	6.81E+02	--	--
Ni	mg/L	8.60E-01	8.60E-01	8.60E-01	8.60E-01	8.60E-01	8.60E-01	--	--
Pb	mg/L	1.14E-02	2.30E-02	3.84E-02	5.28E-02	5.28E-02	5.28E-02	--	--
Sb	mg/L	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	8.00E-02	--	--
Se	mg/L	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	--	--
SO ₄	mg/L	2.34E+03	2.34E+03	2.34E+03	2.34E+03	2.34E+03	2.34E+03	--	--
Tl	mg/L	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	--	--
V	mg/L	3.17E-02	6.42E-02	1.07E-01	2.97E-01	2.97E-01	3.10E-01	--	--
Zn	mg/L	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	9.00E-02	--	--

¹ Stockpile removed at end of year 20

Table 4-51. Parameter Concentrations in Leachate from Lean Ore Surge Pile under Reasonable Alternative 1 (Low Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 12	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	2.50E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	--	--
Al	mg/L	3.89E+00	6.53E+01	8.30E+01	8.30E+01	8.30E+01	8.30E+01	--	--
As	mg/L	3.88E-03	6.52E-02	9.38E-02	2.51E-01	2.51E-01	2.02E-01	--	--
B	mg/L	1.29E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	--	--
Ba	mg/L	3.29E-02	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	--	--
Be	mg/L	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03	--	--
Ca	mg/L	1.77E+01	2.98E+02	4.29E+02	4.80E+02	4.80E+02	4.80E+02	--	--
Cd	mg/L	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	--	--
Cl	mg/L	9.77E-01	8.90E-01	2.23E+00	2.23E+00	4.33E-01	2.76E+00	--	--
Co	mg/L	2.14E-01	3.60E+00	5.18E+00	1.39E+01	1.39E+01	1.11E+01	--	--
Cu	mg/L	5.15E-02	8.66E-01	1.25E+00	3.34E+00	3.34E+00	2.68E+00	--	--
F	mg/L	6.30E-02	6.25E-02	6.23E-02	6.23E-02	6.22E-02	6.22E-02	--	--
Fe	mg/L	6.21E+01	2.35E+02	2.35E+02	2.35E+02	2.35E+02	2.35E+02	--	--
Hardness	mg/L	1.54E+02	2.59E+03	3.72E+03	5.44E+03	5.44E+03	5.44E+03	--	--
K	mg/L	8.15E+00	3.80E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01	--	--
Mg	mg/L	2.67E+01	4.48E+02	6.45E+02	1.03E+03	1.03E+03	1.03E+03	--	--
Mn	mg/L	5.48E-01	9.20E+00	1.32E+01	3.55E+01	3.55E+01	2.85E+01	--	--
Na	mg/L	3.35E+00	5.62E+01	8.09E+01	2.17E+02	2.17E+02	1.74E+02	--	--
Ni	mg/L	2.77E+00	4.66E+01	6.70E+01	1.80E+02	1.80E+02	1.44E+02	--	--
Pb	mg/L	4.66E-03	5.28E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02	--	--
Sb	mg/L	1.61E-03	2.71E-02	3.90E-02	8.00E-02	8.00E-02	8.00E-02	--	--
Se	mg/L	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	--	--
SO ₄	mg/L	3.42E+02	5.75E+03	8.28E+03	9.60E+03	9.60E+03	9.60E+03	--	--
Tl	mg/L	6.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05	--	--
V	mg/L	8.24E-04	1.39E-02	1.99E-02	5.35E-02	5.35E-02	4.29E-02	--	--
Zn	mg/L	3.97E+00	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	--	--

¹ Stockpile removed at end of year 20

Table 4-52. Parameter Concentrations in Leachate from Lean Ore Surge Pile under Reasonable Alternative 1 (Average Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 12	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	1.44E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	--	--
Al	mg/L	2.24E+00	3.77E+01	5.43E+01	8.30E+01	8.30E+01	8.30E+01	--	--
As	mg/L	2.24E-03	3.76E-02	5.42E-02	1.45E-01	1.45E-01	1.17E-01	--	--
B	mg/L	7.46E-02	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	--	--
Ba	mg/L	1.90E-02	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	--	--
Be	mg/L	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03	--	--
Ca	mg/L	1.02E+01	1.72E+02	2.48E+02	4.80E+02	4.80E+02	4.80E+02	--	--
Cd	mg/L	1.45E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	--	--
Cl	mg/L	5.64E-01	5.14E-01	1.29E+00	1.29E+00	2.50E-01	1.59E+00	--	--
Co	mg/L	1.24E-01	2.08E+00	2.99E+00	8.01E+00	8.01E+00	6.43E+00	--	--
Cu	mg/L	2.97E-02	5.00E-01	7.20E-01	1.93E+00	1.93E+00	1.55E+00	--	--
F	mg/L	6.30E-02	6.27E-02	6.26E-02	6.26E-02	6.22E-02	6.22E-02	--	--
Fe	mg/L	3.58E+01	2.35E+02	2.35E+02	2.35E+02	2.35E+02	2.35E+02	--	--
Hardness	mg/L	8.89E+01	1.49E+03	2.15E+03	5.31E+03	5.31E+03	4.50E+03	--	--
K	mg/L	4.71E+00	3.80E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01	--	--
Mg	mg/L	1.54E+01	2.59E+02	3.72E+02	9.98E+02	9.98E+02	8.02E+02	--	--
Mn	mg/L	3.16E-01	5.31E+00	7.65E+00	2.05E+01	2.05E+01	1.65E+01	--	--
Na	mg/L	1.93E+00	3.25E+01	4.67E+01	1.25E+02	1.25E+02	1.01E+02	--	--
Ni	mg/L	1.60E+00	2.69E+01	3.87E+01	1.04E+02	1.04E+02	8.33E+01	--	--
Pb	mg/L	2.69E-03	4.52E-02	5.28E-02	5.28E-02	5.28E-02	5.28E-02	--	--
Sb	mg/L	9.30E-04	1.56E-02	2.25E-02	6.03E-02	6.03E-02	4.84E-02	--	--
Se	mg/L	2.02E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	--	--
SO ₄	mg/L	1.98E+02	3.32E+03	4.78E+03	9.60E+03	9.60E+03	9.60E+03	--	--
Tl	mg/L	4.88E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05	--	--
V	mg/L	4.76E-04	8.00E-03	1.15E-02	3.09E-02	3.09E-02	2.48E-02	--	--
Zn	mg/L	2.29E+00	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	--	--

¹ Stockpile removed at end of year 20

Table 4-53. Parameter Concentrations in Leachate from Lean Ore Surge Pile under Reasonable Alternative 1 (High Liner Yield)

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 12	Mine Year 15	Mine Year 20	Closure ¹	Post-closure ¹
Ag	mg/L	1.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	7.00E-04	--	--
Al	mg/L	1.56E+00	2.63E+01	3.78E+01	8.30E+01	8.30E+01	8.13E+01	--	--
As	mg/L	1.56E-03	2.62E-02	3.77E-02	1.01E-01	1.01E-01	8.11E-02	--	--
B	mg/L	5.19E-02	7.60E-01	7.60E-01	7.60E-01	7.60E-01	7.60E-01	--	--
Ba	mg/L	1.32E-02	1.90E-01	1.90E-01	1.90E-01	1.90E-01	1.90E-01	--	--
Be	mg/L	1.78E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03	--	--
Ca	mg/L	7.12E+00	1.20E+02	1.72E+02	4.62E+02	4.62E+02	3.71E+02	--	--
Cd	mg/L	1.01E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	--	--
Cl	mg/L	3.93E-01	3.58E-01	8.98E-01	8.98E-01	1.74E-01	1.11E+00	--	--
Co	mg/L	8.60E-02	1.45E+00	2.08E+00	5.58E+00	5.58E+00	4.48E+00	--	--
Cu	mg/L	2.07E-02	3.48E-01	5.01E-01	1.34E+00	1.34E+00	1.08E+00	--	--
F	mg/L	6.30E-02	6.28E-02	6.27E-02	6.27E-02	6.22E-02	6.24E-02	--	--
Fe	mg/L	2.50E+01	2.35E+02	2.35E+02	2.35E+02	2.35E+02	2.35E+02	--	--
Hardness	mg/L	6.19E+01	1.04E+03	1.50E+03	4.01E+03	4.01E+03	3.22E+03	--	--
K	mg/L	3.28E+00	3.80E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01	--	--
Mg	mg/L	1.07E+01	1.80E+02	2.59E+02	6.95E+02	6.95E+02	5.58E+02	--	--
Mn	mg/L	2.20E-01	3.70E+00	5.32E+00	1.43E+01	1.43E+01	1.15E+01	--	--
Na	mg/L	1.34E+00	2.26E+01	3.25E+01	8.72E+01	8.72E+01	7.00E+01	--	--
Ni	mg/L	1.11E+00	1.87E+01	2.70E+01	7.23E+01	7.23E+01	5.80E+01	--	--
Pb	mg/L	1.87E-03	3.15E-02	4.53E-02	5.28E-02	5.28E-02	5.28E-02	--	--
Sb	mg/L	6.48E-04	1.09E-02	1.57E-02	4.20E-02	4.20E-02	3.37E-02	--	--
Se	mg/L	1.41E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	2.90E-03	--	--
SO ₄	mg/L	1.38E+02	2.31E+03	3.33E+03	8.92E+03	8.92E+03	7.16E+03	--	--
Tl	mg/L	3.40E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05	6.00E-05	--	--
V	mg/L	3.31E-04	5.57E-03	8.02E-03	2.15E-02	2.15E-02	1.73E-02	--	--
Zn	mg/L	1.60E+00	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	--	--

¹ Stockpile removed at end of year 20

Table 4-54. Proposed East and West Pit Flooding Schedule - Average Flows for Mine Site Reasonable Alternative 1

		Source of Water to East Pit and West Pit - AVERAGE FLOWS FOR MINE SITE REASONABLE ALTERNATIVE 1																								
Year after Mine Closure (Year 20)	Year from Start of Mine	Stormwater runoff from Cat. 1 Stockpiles to West Pit (acre-feet)	Non-stockpile stormwater runoff within Mine Site to West Pit (acre-feet)	Liner Leakage from Overburden portion of Cat. 1 Stockpile to West Pit (acre-feet)	Liner Leakage from Wasterock portion of Cat. 1 Stockpile to West Pit (acre-feet)	Direct net precipitation over West Pit (acre-feet)	Groundwater inflow to West Pit (acre-feet)	Liner Leakage from Overburden portion of Cat 1 Stockpile to East Pit (acre-feet)	Liner Leakage from Wasterock Portion of Cat 1 Stockpile to East Pit (acre-feet)	Stormwater runoff from Cat. 1 Stockpile to East Pit (acre-feet)	Stormwater runoff from Cat. 2/3 Stockpiles to East Pit (acre-feet)	Non-stockpile stormwater runoff within Mine Site to East Pit (acre-feet)	Pumping from WWTF to East Pit (acre-feet) ¹	Direct net precipitation over North East Pit (acre-feet)	Direct net precipitation over Central Pit (acre-feet)	Groundwater inflow to Central Pit (acre-feet)	Groundwater outflow from Central Pit (acre-feet)	Groundwater inflow to East Pit (acre-feet)	Groundwater outflow from East Pit (acre-feet)	Incremental West Pit flooding volume via East Pit (acre-feet)	Incremental West Pit flooding volume directly to West Pit (acre-feet)	Cumulative West Pit flooded volume (acre-feet)	Water elevation in West Pit (ft-MSL)	Remaining storage capacity in West Pit (acre-feet)	Percent full of West Pit (%)	
NA	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	12	-	-	-	-	-	-	-	62.55	-	-	-	(386.96)	111.13	51.08	1.48	-	1,548.39	-	-	-	-	-	-	-	
NA	13	-	-	-	-	-	-	-	62.55	-	-	-	(76.86)	111.13	51.08	40.64	-	1,446.23	-	-	-	-	-	-	-	
NA	14	-	-	-	-	-	-	-	62.55	-	-	-	457.96	111.13	51.08	79.80	-	1,344.08	-	-	-	-	-	-	-	
NA	15	-	-	-	-	-	-	-	62.55	-	-	-	(151.59)	111.13	51.08	80.65	(0.00)	1,241.93	0.00	-	-	-	-	-	-	
NA	16	-	-	-	-	-	-	-	62.55	-	-	-	(303.37)	111.13	51.08	70.97	(3.23)	1,000.00	(41.94)	-	-	-	-	-	-	
NA	17	-	-	-	-	-	-	-	62.55	-	-	-	455.54	111.13	51.08	61.29	(6.45)	758.06	(83.87)	-	-	-	-	-	-	
NA	18	-	-	-	-	-	-	-	62.55	-	-	-	1846.63	111.13	51.08	51.61	(9.68)	516.13	(125.81)	-	-	-	-	-	-	
NA	19	-	-	-	-	-	-	-	62.55	-	-	-	1768.57	111.13	51.08	41.94	(12.90)	274.19	(167.74)	-	-	-	-	-	-	
NA	20	-	-	-	-	-	-	-	62.55	-	-	-	771.05	111.13	51.08	32.26	(16.13)	32.26	(209.68)	-	-	-	-	-	-	
1	21	75.56	283.53	-	234.54	219.20	1,307.00	-	15.64	96.00	5.17	287.08	652.34	135.90	-	-	-	33.44	(3.85)	1,221.71	2,119.83	3,342	933	104,672	3.1	
2	22	75.56	283.53	-	234.54	219.20	1,307.00	-	15.64	96.00	5.17	287.08	602.02	135.90	-	-	-	33.44	(3.85)	1,171.38	2,119.83	6,633	983	101,381	6.1	
3	23	75.56	283.53	-	234.54	219.20	1,273.09	-	15.64	96.00	5.17	287.08	560.59	135.90	-	-	-	33.44	(3.85)	1,129.96	2,085.92	9,849	1,025	98,165	9.1	
4	24	75.56	283.53	-	234.54	219.20	1,222.34	-	15.64	96.00	5.17	287.08	525.52	135.90	-	-	-	33.44	(3.85)	1,094.89	2,035.17	12,979	1,061	95,035	12.0	
5	25	75.56	283.53	-	234.54	219.20	1,177.22	-	15.64	96.00	5.17	287.08	494.99	135.90	-	-	-	33.44	(3.85)	1,064.36	1,990.04	16,033	1,091	91,981	14.8	
6	26	75.56	283.53	-	234.54	219.20	1,135.85	-	15.64	96.00	5.17	287.08	467.70	135.90	-	-	-	33.44	(3.85)	1,037.07	1,948.68	19,019	1,118	88,995	17.6	
7	27	75.56	283.53	-	234.54	219.20	1,097.27	-	15.64	96.00	5.17	287.08	442.73	135.90	-	-	-	33.44	(3.85)	1,012.09	1,910.10	21,941	1,143	86,073	20.3	
8	28	75.56	283.53	-	234.54	219.20	1,060.89	-	15.64	96.00	5.17	287.08	419.40	135.90	-	-	-	33.44	(3.85)	988.77	1,873.72	24,804	1,166	83,210	23.0	
9	29	75.56	283.53	-	234.54	219.20	1,026.32	-	15.64	96.00	5.17	287.08	397.26	135.90	-	-	-	33.44	(3.85)	966.62	1,839.15	27,609	1,187	80,404	25.6	
10	30	75.56	283.53	-	234.54	219.20	993.30	-	15.64	96.00	5.17	287.08	375.95	135.90	-	-	-	33.44	(3.85)	945.32	1,806.13	30,361	1,206	77,653	28.1	
11	31	75.56	283.53	-	234.54	219.20	961.61	-	15.64	96.00	5.17	287.08	355.25	135.90	-	-	-	33.44	(3.85)	924.62	1,774.44	33,060	1,224	74,954	30.6	
12	32	75.56	283.53	-	234.54	219.20	931.11	-	15.64	96.00	5.17	287.08	334.98	135.90	-	-	-	33.44	(3.85)	904.35	1,743.94	35,708	1,242	72,306	33.1	
13	33	75.56	283.53	-	234.54	219.20	901.69	-	15.64	96.00	5.17	287.08	315.01	135.90	-	-	-	33.44	(3.85)	884.38	1,714.51	38,307	1,258	69,707	35.5	
14	34	75.56	283.53	-	234.54	219.20	873.23	-	15.64	96.00	5.17	287.08	303.50	135.90	-	-	-	33.68	(3.85)	873.11	1,686.06	40,866	1,274	67,147	37.8	
15	35	75.56	283.53	-	234.54	219.20	845.59	-	15.64	96.00	5.17	287.08	303.50	135.90	-	-	-	34.14	(3.85)	873.57	1,658.42	43,398	1,289	64,615	40.2	
16	36	75.56	283.53	-	234.54	219.20	818.56	-	15.64	96.00	5.17	287.08	303.50	135.90	-	-	-	34.58	(3.85)	874.01	1,631.39	45,904	1,303	62,110	42.5	
17	37	75.56	283.53	-	234.54	219.20	792.12	-	15.64	96.00	5.17	287.08	303.50	135.90	-	-	-	35.01	(3.85)	874.44	1,604.95	48,383	1,317	59,631	44.8	
18	38	75.56	283.53	-	234.54	219.20	766.22	-	15.64	96.00	5.17	287.08	303.50	135.90	-	-	-	35.42	(3.85)	874.84	1,579.04	50,837	1,330	57,177	47.1	
19	39	75.56	283.53	-	234.54	219.20	740.82	-	15.64	96.00	5.17	287.08	303.50	135.90	-	-	-	35.81	(3.85)	875.24	1,553.65	53,266	1,343	54,748	49.3	
20	40	75.56	283.53	-	234.54	219.20	715.90	-	15.64	96.00	5.17	287.08	303.50	135.90	-	-	-	36.19	(3.85)	875.62	1,528.73	55,670	1,356	52,344	51.5	
21	41	75.56	283.53	-	234.54	219.20	691.43	-	15.64	96.00	5.17	287.08	303.50	135.90	-	-	-	36.54	(3. (							

Table 4-55. Proposed East and West Pit Flooding Schedule - Low Flows for Mine Site Reasonable Alternative 1

		Source of water to West Pit - LOW FLOWS FOR MINE SITE REASONABLE ALTERNATIVE 1																									
Year after Mine Closure (Year 20)	Year from Start of Mine	Stormwater runoff from Cat. 1 Stockpiles to West Pit (acre-feet)	Non-stockpile stormwater runoff within Mine Site to West Pit (acre-feet)	Liner Leakage from Overburden portion of Cat. 1 Stockpile to West Pit (acre-feet)	Liner Leakage from Wasterock portion of Cat. 1 Stockpile to West Pit (acre-feet)	Direct net precipitation over West Pit (acre-feet)	Groundwater inflow to West Pit (acre-feet)	Liner Leakage from Overburden portion of Cat 1 Stockpile to East Pit (acre-feet)	Liner Leakage from Wasterock Portion of Cat 1 Stockpile to East Pit (acre-feet)	Stormwater runoff from Cat. 1 Stockpile to East Pit (acre-feet)	Stormwater runoff from Cat. 2/3 Stockpiles to East Pit (acre-feet)	Non-stockpile stormwater runoff within Mine Site to East Pit (acre-feet)	Pumping from WWTF to East Pit (acre-feet) ¹	Direct net precipitation over North East Pit (acre-feet)	Direct net precipitation over Central Pit (acre-feet)	Groundwater inflow to Central Pit (acre-feet)	Groundwater outflow from Central Pit (acre-feet)	Groundwater inflow to East Pit (acre-feet)	Groundwater outflow from East Pit (acre-feet)	Incremental West Pit flooding volume via East Pit (acre-feet)	Incremental West Pit flooding volume directly to West Pit (acre-feet)	Cumulative West Pit flooded volume (acre-feet)	Water elevation in West Pit (ft-MSL)	Remaining storage capacity in West Pit (acre-feet)	Percent full of West Pit (%)		
NA	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
NA	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
NA	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
NA	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
NA	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
NA	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
NA	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
NA	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
NA	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
NA	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
NA	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
NA	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
NA	13	-	-	-	-	-	-	-	45.53	-	-	-	-	(386.96)	111.13	51.08	1.48	-	1,548.39	-	-	-	-	-	-		
NA	14	-	-	-	-	-	-	-	45.53	-	-	-	-	(76.86)	111.13	51.08	40.64	-	1,446.23	-	-	-	-	-	-		
NA	15	-	-	-	-	-	-	-	45.53	-	-	-	-	457.96	111.13	51.08	79.80	-	1,344.08	-	-	-	-	-	-		
NA	16	-	-	-	-	-	-	-	45.53	-	-	-	-	(151.59)	111.13	51.08	80.65	(0.00)	1,241.93	0.00	-	-	-	-	-		
NA	17	-	-	-	-	-	-	-	45.53	-	-	-	-	(303.37)	111.13	51.08	70.97	(3.23)	1,000.00	(41.94)	-	-	-	-	-		
NA	18	-	-	-	-	-	-	-	45.53	-	-	-	-	455.54	111.13	51.08	61.29	(6.45)	758.06	(83.87)	-	-	-	-	-		
NA	19	-	-	-	-	-	-	-	45.53	-	-	-	-	1846.63	111.13	51.08	51.61	(9.68)	516.13	(125.81)	-	-	-	-	-		
NA	20	-	-	-	-	-	-	-	45.53	-	-	-	-	1768.57	111.13	51.08	41.94	(12.90)	274.19	(167.74)	-	-	-	-	-		
1	21	21.76	283.53	-	170.72	219.20	1,307.00	-	11.38	27.65	1.49	287.08	419.84	135.90	-	-	32.26	(16.13)	32.26	(209.68)	912.92	2,002.21	2,915	926	105,098	2.7	
2	22	21.76	283.53	-	170.72	219.20	1,307.00	-	11.38	27.65	1.49	287.08	369.52	135.90	-	-	-	-	33.44	(3.85)	862.60	2,002.21	5,780	970	102,234	5.4	
3	23	21.76	283.53	-	170.72	219.20	1,287.65	-	11.38	27.65	1.49	287.08	328.09	135.90	-	-	-	-	33.44	(3.85)	821.18	1,982.86	8,584	1,010	99,430	7.9	
4	24	21.76	283.53	-	170.72	219.20	1,241.65	-	11.38	27.65	1.49	287.08	293.02	135.90	-	-	-	-	33.44	(3.85)	786.11	1,936.85	11,307	1,042	96,707	10.5	
5	25	21.76	283.53	-	170.72	219.20	1,200.91	-	11.38	27.65	1.49	287.08	262.49	135.90	-	-	-	-	33.44	(3.85)	755.58	1,896.11	13,959	1,071	94,055	12.9	
6	26	21.76	283.53	-	170.72	219.20	1,163.70	-	11.38	27.65	1.49	287.08	235.20	135.90	-	-	-	-	33.44	(3.85)	728.29	1,858.91	16,546	1,096	91,468	15.3	
7	27	21.76	283.53	-	170.72	219.20	1,129.11	-	11.38	27.65	1.49	287.08	210.23	135.90	-	-	-	-	33.44	(3.85)	703.31	1,824.31	19,073	1,119	88,940	17.7	
8	28	21.76	283.53	-	170.72	219.20	1,096.58	-	11.38	27.65	1.49	287.08	186.90	135.90	-	-	-	-	33.44	(3.85)	679.98	1,791.79	21,545	1,140	86,468	19.9	
9	29	21.76	283.53	-	170.72	219.20	1,065.75	-	11.38	27.65	1.49	287.08	164.76	135.90	-	-	-	-	33.44	(3.85)	657.84	1,760.96	23,964	1,159	84,050	22.2	
10	30	21.76	283.53	-	170.72	219.20	1,036.36	-	11.38	27.65	1.49	287.08	143.45	135.90	-	-	-	-	33.44	(3.85)	636.54	1,731.57	26,332	1,177	81,682	24.4	
11	31	21.76	283.53	-	170.72	219.20	1,008.24	-	11.38	27.65	1.49	287.08	122.75	135.90	-	-	-	-	33.44	(3.85)	615.83	1,703.44	28,651	1,194	79,362	26.5	
12	32	21.76	283.53	-	170.72	219.20	981.22	-	11.38	27.65	1.49	287.08	102.48	135.90	-	-	-	-	33.44	(3.85)	595.56	1,676.43	30,923	1,210	77,090	28.6	
13	33	21.76	283.53	-	170.72	219.20	955.21	-	11.38	27.65	1.49	287.08	82.51	135.90	-	-	-	-	33.44	(3.85)	575.60	1,650.42	33,149	1,225	74,864	30.7	
14	34	21.76	283.53	-	170.72	219.20	930.11	-	11.38	27.65	1.49	287.08	71.00	135.90	-	-	-	-	33.44	(3.85)	564.08	1,625.32	35,339	1,239	72,675	32.7	
15	35	21.76	283.53	-	170.72	219.20	905.76	-	11.38	27.65	1.49	287.08	71.00	135.90	-	-	-	-	33.44	(3.85)	564.08	1,600.97	37,504	1,253	70,510	34.7	
16	36	21.76	283.53	-	170.72	219.20	881.98	-	11.38	27.65	1.49	287.08	71.00	135.90	-	-	-	-	33.53	(3.85)	564.18	1,577.19	39,645	1,266	68,368	36.7	
17	37	21.76	283.53	-	170.72	219.20	858.73	-	11.38	27.65	1.49	287.08	71.00	135.90	-	-	-	-	33.92	(3.85)	564.57	1,553.94	41,764	1,279	66,250	38.7	
18	38	21.76	283.53	-	170.72	219.20	835.97	-	11.38	27.65	1.49	287.08	71.00	135.90	-	-	-	-	34.30	(3.85)	564.94	1,531.18	43,860	1,291	64,154	40.6	
19	39	21.76	283.53	-	170.72	219.20	813.67	-	11.38	27.65	1.49	287.08	71.00	135.90	-	-	-	-	34.66	(3.85)	565.30	1,508.88	45,934	1,303	62,080	42.5	
20	40	21.76	283.53	-	170.72	219.20	791.80	-	11.38	27.65	1.49	287.08	71.00	135.90	-	-	-	-	35.01	(3.85)	565.66	1,487.01	47,987	1,315	60,027	44.4	
21	41	21.76	283.53	-	170.72	219.20	770.34	-	11.38	27.65	1.49	287.08	71.00	135.90	-	-	-	-	35.35	(3.85)	565.99	1,465.					

Table 4-56. Proposed East and West Pit Flooding Schedule - High Flows for Mine Site Reasonable Alternative 1

		Source of water to West Pit - HIGH FLOWS FOR MINE SITE REASONABLE ALTERNATIVE 1																		Incremental West Pit flooding volume via East Pit (acre-feet)	Incremental West Pit flooding volume directly to West Pit (acre-feet)	Cumulative West Pit flooded volume (acre-feet)	Water elevation in West Pit (ft-MSL)	Remaining storage capacity in West Pit (acre-feet)	Percent full of West Pit (%)
Year after Mine Closure (Year 20)	Year from Start of Mine	Stormwater runoff from Cat. 1 Stockpiles to West Pit (acre-feet)	Non-stockpile stormwater runoff within Mine Site to West Pit (acre-feet)	Liner Leakage from Overburden portion of Cat. 1 Stockpile to West Pit (acre-feet)	Liner Leakage from Wasterock portion of Cat. 1 Stockpile to West Pit (acre-feet)	Direct net precipitation over West Pit (acre-feet)	Groundwater inflow to West Pit (acre-feet)	Liner Leakage from Overburden portion of Cat 1 Stockpile to East Pit (acre-feet)	Liner Leakage from Wasterock Portion of Cat 1 Stockpile to East Pit (acre-feet)	Stormwater runoff from Cat. 1 Stockpile to East Pit (acre-feet)	Stormwater runoff from Cat. 2/3 Stockpiles to East Pit (acre-feet)	Non-stockpile stormwater runoff within Mine Site to East Pit (acre-feet)	Pumping from WWTF to East Pit (acre-feet) ¹	Direct net precipitation over North East Pit (acre-feet)	Direct net precipitation over Central Pit (acre-feet)	Groundwater inflow to Central Pit (acre-feet)	Groundwater outflow from Central Pit (acre-feet)	Groundwater inflow to East Pit (acre-feet)	Groundwater outflow from East Pit (acre-feet)						
NA	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NA	12	-	-	-	-	-	-	-	166.78	-	-	-	(386.96)	111.13	51.08	1.48	-	1,548.39	-	-	-	-	-	-	-
NA	13	-	-	-	-	-	-	166.78	166.78	-	-	-	(76.86)	111.13	51.08	40.64	-	1,446.23	-	-	-	-	-	-	-
NA	14	-	-	-	-	-	-	166.78	166.78	-	-	-	457.96	111.13	51.08	79.80	-	1,344.08	-	-	-	-	-	-	-
NA	15	-	-	-	-	-	-	166.78	166.78	-	-	-	(151.59)	111.13	51.08	80.65	(0.00)	1,241.93	0.00	-	-	-	-	-	-
NA	16	-	-	-	-	-	-	166.78	166.78	-	-	-	(303.37)	111.13	51.08	70.97	(3.23)	1,000.00	(41.94)	-	-	-	-	-	-
NA	17	-	-	-	-	-	-	166.78	166.78	-	-	-	455.54	111.13	51.08	61.29	(6.45)	758.06	(83.87)	-	-	-	-	-	-
NA	18	-	-	-	-	-	-	166.78	166.78	-	-	-	1846.63	111.13	51.08	51.61	(9.68)	516.13	(125.81)	-	-	-	-	-	-
NA	19	-	-	-	-	-	-	166.78	166.78	-	-	-	1768.57	111.13	51.08	41.94	(12.90)	274.19	(167.74)	-	-	-	-	-	-
NA	20	-	-	-	-	-	-	166.78	166.78	-	-	-	771.05	111.13	51.08	32.26	(16.13)	32.26	(209.68)	-	-	-	-	-	-
1	21	136.60	283.53	-	625.42	219.20	1,307.00	-	41.69	173.56	9.35	287.08	470.14	135.90	-	-	-	33.44	(3.85)	1,147.31	2,571.75	3,719	939	104,295	3.4
2	22	136.60	283.53	-	625.42	219.20	1,307.00	-	41.69	173.56	9.35	287.08	419.82	135.90	-	-	-	33.44	(3.85)	1,096.98	2,571.75	7,388	994	100,626	6.8
3	23	136.60	283.53	-	625.42	219.20	1,260.65	-	41.69	173.56	9.35	287.08	378.39	135.90	-	-	-	33.44	(3.85)	1,055.56	2,525.40	10,969	1,038	97,045	10.2
4	24	136.60	283.53	-	625.42	219.20	1,205.81	-	41.69	173.56	9.35	287.08	343.32	135.90	-	-	-	33.44	(3.85)	1,020.49	2,470.56	14,460	1,076	93,554	13.4
5	25	136.60	283.53	-	625.42	219.20	1,156.88	-	41.69	173.56	9.35	287.08	312.79	135.90	-	-	-	33.44	(3.85)	989.96	2,421.63	17,871	1,108	90,142	16.5
6	26	136.60	283.53	-	625.42	219.20	1,111.91	-	41.69	173.56	9.35	287.08	285.50	135.90	-	-	-	33.44	(3.85)	962.67	2,376.66	21,211	1,137	86,803	19.6
7	27	136.60	283.53	-	625.42	219.20	1,069.87	-	41.69	173.56	9.35	287.08	260.53	135.90	-	-	-	33.44	(3.85)	937.70	2,334.62	24,483	1,163	83,531	22.7
8	28	136.60	283.53	-	625.42	219.20	1,030.15	-	41.69	173.56	9.35	287.08	237.20	135.90	-	-	-	33.44	(3.85)	914.37	2,294.90	27,692	1,187	80,321	25.6
9	29	136.60	2																						

Table 4-57. High, Average and Low Estimates of Stockpile Stormwater Runoff for Pit Flooding Under Mine Site-Reasonable Alternative 1

Stockpile	Contributing Area	Stormwater Yield (inches/year)		
		High	Average	Low
Category 1 Waste Rock-reclaimed with ET cover	316 acres to the East Pit	8	3	0
	248 acres to the West Pit	8	3	0
Category 2/3 Waste Rock-reclaimed with ET cover	17 acres to the East Pit	8	3	0

Table 4-58. East and West Pit Water Quality under Reasonable Alternative 1 (Low Liner Leakage)

Parameter	Units	East Pit		West pit
		Closure ¹	Post-Closure ²	Post-Closure ²
Ag	mg/L	3.47E-04	3.47E-04	9.36E-04
Al	mg/L	1.07E-01	1.59E-02	1.86E-02
As	mg/L	1.77E-02	1.77E-02	9.02E-02
B	mg/L	4.23E-01	4.23E-01	2.97E-01
Ba	mg/L	4.80E-02	4.80E-02	8.57E-02
Be	mg/L	2.77E-04	1.19E-04	7.99E-04
Ca	mg/L	1.67E+02	1.67E+02	1.07E+02
Cd	mg/L	1.49E-03	2.26E-04	1.67E-04
Cl	mg/L	1.58E+02	1.26E+02	3.23E+01
Co	mg/L	8.54E-04	8.75E-05	6.85E-03
Cu	mg/L	1.03E-02	9.66E-04	6.00E-03
F	mg/L	6.06E-01	6.06E-01	4.15E-01
Fe	mg/L	8.29E-01	2.83E-04	1.00E-01
Hardness	mg/L	6.15E+02	5.62E+02	3.62E+02
K	mg/L	2.99E+01	2.99E+01	1.76E+01
Mg	mg/L	4.68E+01	3.50E+01	2.30E+01
Mn	mg/L	7.79E-02	2.00E-04	1.00E-02
Na	mg/L	1.14E+03	1.11E+03	3.25E+02
Ni	mg/L	7.39E-03	7.46E-04	6.08E-02
Pb	mg/L	1.31E-02	1.31E-02	7.75E-03
Sb	mg/L	1.26E-02	1.26E-02	1.10E-01
Se	mg/L	4.23E-02	3.49E-02	1.08E-02
SO ₄	mg/L	3.35E+02	3.35E+02	2.71E+02
Tl	mg/L	2.13E-04	1.03E-05	1.91E-04
V	mg/L	5.58E-02	5.58E-02	5.71E-02
Zn	mg/L	2.59E-01	2.85E-02	3.89E-02

¹ Maximum concentration reported between Years 21.3 to 76.8

² Maximum concentration reported in Year 76.8 or later

Table 4-59. East and West Pit Water Quality under Reasonable Alternative 1 (Average Liner Leakage)

Parameter	Units	East Pit		West pit
		Closure ¹	Post-Closure ²	Post-Closure ²
Ag	mg/L	3.08E-04	2.89E-04	8.52E-04
Al	mg/L	1.13E-01	3.68E-02	1.86E-02
As	mg/L	1.57E-02	1.48E-02	9.64E-02
B	mg/L	3.89E-01	3.67E-01	3.36E-01
Ba	mg/L	4.27E-02	4.00E-02	8.40E-02
Be	mg/L	3.12E-04	9.88E-05	6.98E-04
Ca	mg/L	1.75E+02	1.45E+02	1.20E+02
Cd	mg/L	1.68E-03	1.88E-04	2.25E-04
Cl	mg/L	1.68E+02	1.08E+02	4.81E+01
Co	mg/L	9.64E-04	7.28E-05	4.84E-03
Cu	mg/L	1.15E-02	1.38E-03	6.00E-03
F	mg/L	6.36E-01	5.28E-01	4.49E-01
Fe	mg/L	5.42E-01	5.40E-01	1.00E-01
Hardness	mg/L	6.47E+02	5.04E+02	4.07E+02
K	mg/L	2.69E+01	2.53E+01	2.06E+01
Mg	mg/L	4.93E+01	3.17E+01	2.63E+01
Mn	mg/L	5.10E-02	5.08E-02	1.00E-02
Na	mg/L	1.21E+03	9.24E+02	4.43E+02
Ni	mg/L	8.34E-03	6.21E-04	4.33E-02
Pb	mg/L	1.18E-02	1.11E-02	7.17E-03
Sb	mg/L	1.17E-02	1.10E-02	9.61E-02
Se	mg/L	4.49E-02	2.91E-02	1.48E-02
SO ₄	mg/L	3.45E+02	2.82E+02	2.19E+02
Tl	mg/L	1.44E-04	1.43E-04	1.73E-04
V	mg/L	5.74E-02	4.67E-02	6.17E-02
Zn	mg/L	2.90E-01	2.91E-02	4.77E-02

¹ Maximum concentration reported between Years 21.1 to 66.9

² Maximum concentration reported in Year 67.0 or later

Table 4-60. East and West Pit Water Quality under Reasonable Alternative 1 (High Liner Leakage)

Parameter	Units	East Pit		West pit
		Closure ¹	Post-Closure ²	Post-Closure ²
Ag	mg/L	2.40E-04	1.95E-04	7.90E-04
Al	mg/L	1.04E-01	4.57E-02	1.86E-02
As	mg/L	1.23E-02	9.96E-03	1.88E-01
B	mg/L	3.20E-01	2.60E-01	3.60E-01
Ba	mg/L	3.34E-02	2.70E-02	9.43E-02
Be	mg/L	2.57E-04	6.67E-05	6.08E-04
Ca	mg/L	1.55E+02	1.03E+02	1.21E+02
Cd	mg/L	1.38E-03	1.27E-04	1.96E-04
Cl	mg/L	1.48E+02	7.51E+01	3.03E+01
Co	mg/L	7.93E-04	4.92E-05	6.27E-03
Cu	mg/L	9.69E-03	1.43E-03	6.00E-03
F	mg/L	5.64E-01	3.77E-01	3.43E-01
Fe	mg/L	8.51E-01	8.47E-01	1.00E-01
Hardness	mg/L	5.79E+02	3.71E+02	4.08E+02
K	mg/L	2.12E+01	1.75E+01	2.20E+01
Mg	mg/L	4.40E+01	2.37E+01	2.57E+01
Mn	mg/L	7.99E-02	7.95E-02	1.00E-02
Na	mg/L	1.06E+03	6.25E+02	3.10E+02
Ni	mg/L	6.86E-03	4.19E-04	5.20E-02
Pb	mg/L	9.23E-03	7.61E-03	6.58E-03
Sb	mg/L	9.41E-03	7.86E-03	9.19E-02
Se	mg/L	3.92E-02	1.96E-02	9.97E-03
SO ₄	mg/L	3.03E+02	1.93E+02	2.33E+02
Tl	mg/L	2.18E-04	2.17E-04	1.75E-04
V	mg/L	5.03E-02	3.18E-02	7.48E-02
Zn	mg/L	2.41E-01	2.41E-02	5.16E-02

¹ Maximum concentration reported between Years 20.3 and 60.9

² Maximum concentration reported in Year 61.0 or later

Table 4-61. Seepage and Liner Leakage Rates from Overburden Storage and Laydown Area, Sumps, Process Water Ponds, and WWTF Equalization Ponds under Mine Site - Reasonable Alternative 1

Mine Year	Seepage and Liner Leakage Rates (gpm)							
	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 12	Mine Year 15	Mine Year 20	Closure	Post-Closure
Category 1 Sumps ²	0.002083	0.002083	0.002083	0.002083	0.002083	0.002083	0.002083	0.003472
Category 2/3 Sumps ³	0.000013	0.000013	0.000013	0.000013	0.000013	0.000013	0.000013	0.000013
Category 3LO Sumps	0.000012	0.000012	0.000012	0.000012	0.000012	0.000012	0.000012	0.000012
Category 4 Sumps	0.000011	0.000011	0.000011	0.000011	0.000011	0.000011	0	0
Category 4LO Sumps	0.000021	0.000021	0.000021	0.000021	0.000021	0.000021	0	0
WWTF Equalization Ponds ⁴	0.033929	0.001909	0.022992	0.022992	0.019338	0.007283	0	0

Only changes with respect to Mine Site - Proposed Action are shown in this table

¹ No liner present. Overburden Storage and Laydown Area removed at end of Year 20

² Only the southern-most sump of the Cat 1 pile (S-1) drains to Partridge (17% of the total leakage), others drain to pits

³ PW-7 exists only in Year 1 and Year 5

⁴ Rates are averages over period during which water is in the pond (typically 8-30 days)

Table 4-62. Wastewater Treatment Facility (WWTF) Pond Water Quality under Mine Site - Reasonable Alternative 1

Parameter	Units	Mine Year 1	Mine Year 5	Mine Year 10	Mine Year 12	Mine Year 15	Mine Year 20	Closure ¹	Post-Closure ¹
Ag	mg/L	0.0007	0.0008	0.0008	0.0008	0.0007	0.0008	--	--
Al	mg/L	1.11	5.55	4.42	4.97	2.57	0.57	--	--
As	mg/L	0.05	0.16	0.15	0.45	0.43	0.13	--	--
B	mg/L	0.13	0.33	0.32	0.57	0.54	0.25	--	--
Ba	mg/L	0.08	0.10	0.08	0.14	0.14	0.06	--	--
Be	mg/L	0.0005	0.0004	0.0004	0.0004	0.0003	0.0003	--	--
Ca	mg/L	76.40	235.94	194.26	387.66	371.68	149.65	--	--
Cd	mg/L	0.0021	0.0014	0.0010	0.0010	0.0005	0.0002	--	--
Cl	mg/L	10.78	32.84	30.14	30.14	16.95	0.99	--	--
Co	mg/L	0.04	0.29	0.26	0.28	0.28	0.03	--	--
Cu	mg/L	0.039	0.109	0.170	0.223	0.241	0.186	--	--
F	mg/L	0.18	0.17	0.19	0.19	0.13	0.21	--	--
Fe	mg/L	8.58	18.67	12.06	12.06	4.47	0.38	--	--
Hardness	mg/L	268.93	886.84	742.03	1,352.60	1,259.85	493.79	--	--
K	mg/L	12.89	22.24	17.63	35.47	34.03	13.67	--	--
Mg	mg/L	19.06	72.52	62.59	93.77	80.91	29.30	--	--
Mn	mg/L	0.17	0.91	0.85	1.13	1.11	0.24	--	--
Na	mg/L	34.99	153.09	168.11	461.01	448.54	172.95	--	--
Ni	mg/L	0.52	3.73	3.41	3.71	3.63	0.35	--	--
Pb	mg/L	0.003	0.013	0.015	0.033	0.030	0.014	--	--
Sb	mg/L	0.030	0.036	0.031	0.059	0.059	0.026	--	--
Se	mg/L	0.0023	0.0024	0.0023	0.0026	0.0026	0.0022	--	--
SO ₄	mg/L	202.28	960.92	902.42	1,883.00	1,604.06	490.11	--	--
Tl	mg/L	0.00087	0.00093	0.00110	0.00110	0.00044	0.00125	--	--
V	mg/L	0.04	0.19	0.27	1.02	0.97	0.07	--	--
Zn	mg/L	0.57	2.02	1.29	1.29	0.67	0.05	--	--

¹ Pond is never filled after year 20

Table 5-1. Variables Included in Partridge River Model

Variable Type		Variable Label	Variable Description
FLOW VARIABLES	Flows in River / Lake	Q _{r1}	Total flow in Partridge River at SW-001
		Q _{r2}	Total flow in Partridge River at SW-002
		Q _{r3}	Total flow in Partridge River at SW-003
		Q _{r4}	Total flow in Partridge River at SW-004
		Q _{r4a}	Total flow in Partridge River at SW-004a
		Q _{r5}	Total flow in Partridge River at SW-005
		Q _{r6}	Total flow in Partridge River at USGS Gage
		Q _{cl}	Total flow to Colby Lake
	Surface Runoff / Discharges	Q _{s1}	Surface runoff entering Partridge River upstream of SW-001
		Q _{s2}	Surface runoff entering Partridge River between SW-001 and SW-002
		Q _{s3}	Surface runoff entering Partridge River between SW-002 and SW-003
		Q _{s4}	Surface runoff entering Partridge River between SW-003 and SW-004
		Q _{s4a}	Surface runoff entering Partridge River between SW-004 and SW-004a
		Q _{s5}	Surface runoff entering Partridge River between SW-004a and SW-005
		Q _{s6}	Surface runoff entering Partridge River between SW-005 and USGS Gage
		Q _{scl}	Surface runoff entering Colby Lake from the Colby - Whitewater watershed
		Q _{shl}	Discharge from Hoyt Lakes Wastewater Treatment Plant to Colby Lake
		Q _{sns}	Surface water discharge from Northshore (upstream of PM-1)
		Q _{sms}	West Pit overflow to Partridge River
	Groundwater Flows	Q _{g1}	Groundwater entering Partridge River upstream of SW-001
		Q _{g2}	Groundwater entering Partridge River between SW-001 and SW-002
		Q _{g3}	Groundwater entering Partridge River between SW-002 and SW-003
		Q _{g4}	Groundwater entering Partridge River between SW-003 and SW-004
		Q _{g4a}	Groundwater entering Partridge River between SW-004 and SW-004a
		Q _{g5}	Groundwater entering Partridge River between SW-004a and SW-005
		Q _{g6}	Groundwater entering Partridge River between SW-005 and USGS Gage
		Q _{gcl}	Groundwater entering Colby Lake from the Colby - Whitewater watershed
		Q _{gep_003}	Groundwater seepage from the East Pit to the Partridge River node SW-003
		Q _{gep_004}	Groundwater seepage from the East Pit to the Partridge River node SW-004
		Q _{gwp}	Groundwater seepage from the West Pit to the Partridge River
		Q _{gC12}	Liner leakage from Category 1/2 Waste Rock stockpile
		Q _{gC3_003}	Liner leakage from Category 3 Waste Rock Stockpile to the Partridge River node SW-003
		Q _{gC3_004}	Liner leakage from Category 3 Waste Rock Stockpile to the Partridge River node SW-004
		Q _{gC3LO_003}	Liner leakage from Category 3 Lean Ore Stockpile to the Partridge River node SW-003
		Q _{gC3LO_004}	Liner leakage from Category 3 Lean Ore Stockpile to the Partridge River node SW-004
		Q _{gC4}	Liner leakage from Category 4 Waste Rock Stockpile
		Q _{gC4LO}	Liner leakage from Lean Ore Surge Pile
		Q _{gOS}	Leakage from Overburden Storage and Laydown Area Stockpile
		Q _{gO12}	Liner Leakage from Overburden Section of Category 1/2 Waste Rock Stockpile
		Q _{gC12s}	Liner leakage from Category 1/2 Waste Rock Stockpile sumps
		Q _{gC3s}	Liner leakage from Category 3 Waste Rock Stockpile sumps
		Q _{gC3LOs}	Liner leakage from Category 3 Lean Ore Waste Rock Stockpile sumps
		Q _{gC4s}	Liner leakage from Category 4 Waste Rock Stockpile sumps
		Q _{gC4LOs}	Liner leakage from Lean Ore Surge Pile sumps
		Q _{gOp1}	Seepage from Overburden Process Water Pond 1 (PW1)
		Q _{gOp7}	Seepage from Overburden Process Water Pond 7 (PW7)
		Q _{gHRp2}	Leakage from Haul Road Process Water Pond 2 (PW2)
		Q _{gHRp4}	Leakage from Haul Road Process Water Pond 4 (PW4)
		Q _{gRTHp}	Leakage from Rail Transfer Hopper (RTH) Process Water Pond (PW3)
		Q _{gWTFp}	Liner leakage from the NorthMet Wastewater Treatment Facility Equalization Ponds
CONCENTRATION VARIABLES	Concentrations in River	C _{r1}	Parameter concentration in Partridge River at SW-001
		C _{r2}	Parameter concentration in Partridge River at SW-002
		C _{r3}	Parameter concentration in Partridge River at SW-003
		C _{r4}	Parameter concentration in Partridge River at SW-004
		C _{r4a}	Parameter concentration in Partridge River at SW-004a
		C _{r5}	Parameter concentration in Partridge River at SW-005
		C _{r6}	Parameter concentration in Partridge River at USGS gage
		C _{cl}	Parameter concentration to Colby Lake
	Surface Water Concentrations	C _{s1}	Parameter concentration in surface runoff entering river upstream of SW-001
		C _{s2}	Parameter concentration in surface runoff entering river between SW-001 and SW-002
		C _{s3}	Parameter concentration in surface runoff entering Partridge River between SW-002 and SW-003
		C _{s4}	Parameter concentration in surface runoff entering Partridge River between SW-003 and SW-004
		C _{s4a}	Parameter concentration in surface runoff entering Partridge River between SW-004 and SW-004a
		C _{s5}	Parameter concentration in surface runoff entering Partridge River between SW-004a and SW-005
		C _{s6}	Parameter concentration in surface runoff entering Partridge River between SW-005 and USGS Gage
		C _{scl}	Parameter concentration in surface runoff entering Colby Lake from Colby - Whitewater watershed
		C _{shl}	Parameter concentration in Hoyt Lakes Wastewater Treatment Plant discharge to Colby Lake
		C _{sns}	Parameter concentration in Northshore discharge (upstream of PM-1)
		C _{sms}	Parameter concentration in West Pit overflow to Partridge River
	Groundwater Concentrations	C _{g1}	Parameter concentration in groundwater entering river upstream of SW-001
		C _{g2}	Parameter concentration in groundwater entering river between SW-001 and SW-002
		C _{g3}	Parameter concentration in groundwater entering Partridge River between SW-002 and SW-003
		C _{g4}	Parameter concentration in groundwater entering Partridge River between SW-003 and SW-004
		C _{g4a}	Parameter concentration in groundwater entering Partridge River between SW-004 and SW-004a
		C _{g5}	Parameter concentration in groundwater entering Partridge River between SW-004a and SW-005
		C _{g6}	Parameter concentration in groundwater entering Partridge River between SW-005 and USGS Gage
		C _{gcl}	Parameter concentration in groundwater entering Colby Lake from the Colby - Whitewater watershed
		C _{gep}	Parameter concentration in groundwater from the East Pit
		C _{gwp}	Parameter concentration in groundwater from the West Pit
		C _{gC12}	Parameter concentration in liner leakage from Category 1/2 Waste Rock stockpile
		C _{gC3}	Parameter concentration in liner leakage from Category 3 Waste Rock stockpile
		C _{gC3LO}	Parameter concentration in liner leakage from Category 3 Lean Ore stockpile
		C _{gC4}	Parameter concentration in liner leakage from Category 4 Waste Rock stockpile
		C _{gC4LO}	Parameter concentration in liner leakage from Lean Ore Surge Pile
		C _{gOS}	Parameter concentration in leakage from Overburden Storage and Laydown Area Stockpile
		C _{gO12}	Parameter concentration in liner leakage from Overburden Section of Category 1/2 Waste Rock stockpile
		C _{gC12s}	Parameter concentration in liner leakage from Category 1/2 Waste Rock stockpile sumps
		C _{gC3s}	Parameter concentration in liner leakage from Category 3 Waste Rock stockpile sumps
		C _{gC3LOs}	Parameter concentration in liner leakage from Category 3 Lean Ore Waste Rock stockpile sumps
		C _{gC4s}	Parameter concentration in liner leakage from Category 4 Waste Rock stockpile sumps
		C _{gC4LOs}	Parameter concentration in liner leakage from Lean Ore Surge Pile sumps
		C _{gOp1}	Parameter concentration in seepage from Overburden Process Water Pond 1 (PW1)
		C _{gOp7}	Parameter concentration in seepage from Overburden Process Water Pond 7 (PW7)
		C _{gHRp2}	Parameter concentration in leakage from Haul Road Process Water Pond 2 (PW2)
		C _{gHRp4}	Parameter concentration in leakage from Haul Road Process Water Pond 4 (PW4)
		C _{gRTHp}	Parameter concentration in leakage from Rail Transfer Hopper (RTH) Process Water Pond (PW3)
		C _{gWTFp}	Parameter concentration in liner leakage from the NorthMet Wastewater Treatment Facility Equalization Ponds

Table 5-2. Input Concentrations of Northshore Discharge, Surface Runoff, and Groundwater Used in the Partridge River Water Quality Model

Parameter		Units	Concentration at Northshore Discharge	Concentration in Surface Runoff ¹	Concentration in Groundwater
Ag	Silver	mg/L	0.00012	0.0001	0.00055
Al	Aluminum	mg/L	0.0173	0.07	0.125
As	Arsenic	mg/L	0.0065	0.00211	0.00216
B	Boron	mg/L	0.096	0.045	0.087
Ba	Barium	mg/L	0.005	0.00768	0.02192
Be	Beryllium	mg/L	0.0001	0.0001	0.000145
Ca	Calcium	mg/L	24.5	17	14.79
Cd	Cadmium	mg/L	0.0001	0.0001	0.0001
Cl	Chloride	mg/L	1.6	8	6.6
Co	Cobalt	mg/L	0.0005	0.0005	0.00165
Cu	Copper	mg/L	0.00124	0.0017	0.00295
F	Fluoride	mg/L	0.14	0.07	0.28
Fe	Iron	mg/L	0.03	1.6	2.844
Hardness		mg/L	110	110	66.42
K	Potassium	mg/L	2.7	1.3	1.75
Mg	Magnesium	mg/L	10.5	8	8.02
Mn	Manganese	mg/L	0.0086	0.15	0.124
Na	Sodium	mg/L	4.8	2.5	13.33
Ni	Nickel	mg/L	0.00155	0.00156	0.01628
Pb	Lead	mg/L	0.00015	0.0005	0.00112
Sb	Antimony	mg/L	0.0015	0.0015	0.0015
Se	Selenium	mg/L	0.0005	0.0005	0.00191
SO ₄	Sulfate	mg/L	22	9	16.13
Tl	Thallium	mg/L	0.000286	0.0004	0.000004
V	Vanadium ²	mg/L	0.0043	0.0009	0.0043
Zn	Zinc	mg/L	0.00733	0.016	0.0275

¹ Values from calibrations of water quality model for Ag, As, Ba, Be, Cd, Co, Mo, Ni, and Se were zero. The measured average concentrations in the Partridge River or half the detection limit, if the parameter was not detected, were used in these cases.

² Vanadium was not monitored. Values assumed are from Hem (1992)

Table 5-3. Average Baseline Concentrations Measured in the Partridge River

Parameter		Units	SW-002	SW-003	SW-004	SW-005
Ag	Silver	mg/L	0.0001	0.0001	0.0001	0.0001
Al	Aluminum	mg/L	0.0459	0.0603	0.0713	0.2754
As	Arsenic	mg/L	0.001	0.001	0.001	0.001
B	Boron	mg/L	0.0585	0.0661	0.0611	0.0372
Ba	Barium	mg/L	0.0096	0.01	0.005	0.0088
Be	Beryllium	mg/L	0.0001	0.0001	0.0001	0.0001
Ca	Calcium	mg/L	24.5	20.7	20.7	18.6
Cd	Cadmium	mg/L	0.0001	0.0001	0.0001	0.0001
Cl	Chloride	mg/L	1.8	10.5	9.1	6.2
Co	Cobalt	mg/L	0.0005	0.0005	0.0005	0.0008
Cu	Copper	mg/L	0.0005	0.0011	0.0021	0.0017
F	Fluoride	mg/L	0.11	0.09	0.09	0.09
Fe	Iron	mg/L	1.22	1.63	1.34	1.99
Hardness		mg/L	112	101.1	92.9	82.9
K	Potassium	mg/L	2	2	1.6	1
Mg	Magnesium	mg/L	7.5	9	8.3	7.5
Mn	Manganese	mg/L	0.14	0.19	0.13	0.2
Na	Sodium	mg/L	3.2	3.8	3.5	2.9
Ni	Nickel	mg/L	0.0008	0.0016	0.0019	0.0021
Pb	Lead	mg/L	0.0003	0.0002	0.0002	0.0008
Sb	Antimony	mg/L	0.0015	0.0015	0.0015	0.0015
Se	Selenium	mg/L	0.0005	0.0005	0.0005	0.0005
SO ₄	Sulfate	mg/L	6.3	10.9	10	9
Tl	Thallium	mg/L	0.0002	0.0002	0.0002	0.0002
V	Vanadium ¹	mg/L	0.0009	0.0009	0.0009	0.0009
Zn	Zinc	mg/L	0.0101	0.0064	0.0192	0.0167

¹ Vanadium was not monitored in the Partridge River. Value assumed from Hem (1992).

Table 5-4. Deterministic Water Quality Predictions at surface water monitoring station SW-001 (mg/L)

Partridge River SW-001

Low Flow Conditions - Mine Site - Proposed Action

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001
Al	0.0169	0.0337	0.0337	0.0337	0.0337	0.0337	0.0337	0.0337	0.125
As	0.0065	0.0058	0.0058	0.0058	0.0058	0.0058	0.0058	0.0058	0.053
B	0.0960	0.0946	0.0946	0.0946	0.0946	0.0946	0.0946	0.0946	0.5
Ba	0.0050	0.0076	0.0076	0.0076	0.0076	0.0076	0.0076	0.0076	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	24.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	
Cl	1.6	2.4	2.4	2.4	2.4	2.4	2.4	2.4	230
Co	0.0005	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.005
Cu	0.0012	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	
Cu-Std	0.0101	0.0096	0.0096	0.0096	0.0096	0.0096	0.0096	0.0096	
F	0.1400	0.1614	0.1614	0.1614	0.1614	0.1614	0.1614	0.1614	
Fe	0.0300	0.4593	0.4593	0.4593	0.4593	0.4593	0.4593	0.4593	
Hardness	110.0	103.4	103.4	103.4	103.4	103.4	103.4	103.4	
K	2.7	2.6	2.6	2.6	2.6	2.6	2.6	2.6	
Mg	10.5	10.1	10.1	10.1	10.1	10.1	10.1	10.1	
Mn	0.0086	0.0262	0.0262	0.0262	0.0262	0.0262	0.0262	0.0262	
Na	4.8	6.1	6.1	6.1	6.1	6.1	6.1	6.1	
Ni	0.0005	0.0038	0.0038	0.0038	0.0038	0.0038	0.0038	0.0038	
Ni-Std	0.0565	0.0536	0.0536	0.0536	0.0536	0.0536	0.0536	0.0536	
Pb	0.0002	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	
Pb-Std	0.0036	0.0033	0.0033	0.0033	0.0033	0.0033	0.0033	0.0033	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.031
Se	0.0005	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.005
SO ₄	22.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	
Tl	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.00056
V	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	
Zn	0.0073	0.0104	0.0104	0.0104	0.0104	0.0104	0.0104	0.0104	
Zn-Std	0.1149	0.1090	0.1090	0.1090	0.1090	0.1090	0.1090	0.1090	

Notes

- 1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.
- 2) Deterministic Water Quality Predictions at SW-001 does not change during mine operation and closure because it is upstream of the mine.

Table 5-5. Deterministic Water Quality Predictions at surface water monitoring station SW-001 (mg/L)

Partridge River SW-001

Average Flow Conditions - Mine Site - Proposed Action

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0169	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.125
As	0.0065	0.0029	0.0029	0.0029	0.0029	0.0029	0.0029	0.0029	0.053
B	0.0960	0.0553	0.0553	0.0553	0.0553	0.0553	0.0553	0.0553	0.5
Ba	0.0050	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	24.5	18.2	18.2	18.2	18.2	18.2	18.2	18.2	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	
Cl	1.6	6.8	6.8	6.8	6.8	6.8	6.8	6.8	230
Co	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.005
Cu	0.0012	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	
Cu-Std	0.0101	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	
F	0.1400	0.0889	0.0889	0.0889	0.0889	0.0889	0.0889	0.0889	
Fe	0.0300	1.3639	1.3639	1.3639	1.3639	1.3639	1.3639	1.3639	
Hardness	110.0	108.6	108.6	108.6	108.6	108.6	108.6	108.6	
K	2.7	1.6	1.6	1.6	1.6	1.6	1.6	1.6	
Mg	10.5	8.4	8.4	8.4	8.4	8.4	8.4	8.4	
Mn	0.0086	0.1244	0.1244	0.1244	0.1244	0.1244	0.1244	0.1244	
Ni	0.0005	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	
Ni-Std	0.0565	0.0559	0.0559	0.0559	0.0559	0.0559	0.0559	0.0559	
Pb	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	
Pb-Std	0.0036	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.031
Se	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.005
SO ₄	22.1	11.5	11.5	11.5	11.5	11.5	11.5	11.5	
Tl	0.0003	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0043	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	
Zn	0.0073	0.0148	0.0148	0.0148	0.0148	0.0148	0.0148	0.0148	
Zn-Std	0.1149	0.1137	0.1137	0.1137	0.1137	0.1137	0.1137	0.1137	

Notes

- 1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.
- 2) Deterministic Water Quality Predictions at SW-001 does not change during mine operation and closure because it is upstream of the mine.

Table 5-6. Deterministic Water Quality Predictions at surface water monitoring station SW-001 (mg/L)

Partridge River SW-001

High Flow Conditions - Mine Site - Proposed Action

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0169	0.0695	0.0695	0.0695	0.0695	0.0695	0.0695	0.0695	0.125
As	0.0065	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.053
B	0.0960	0.0457	0.0457	0.0457	0.0457	0.0457	0.0457	0.0457	0.5
Ba	0.0050	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	24.5	17.1	17.1	17.1	17.1	17.1	17.1	17.1	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	
Cl	1.6	7.9	7.9	7.9	7.9	7.9	7.9	7.9	230
Co	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.005
Cu	0.0012	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	
Cu-Std	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	
F	0.1400	0.0713	0.0713	0.0713	0.0713	0.0713	0.0713	0.0713	
Fe	0.0300	1.5842	1.5842	1.5842	1.5842	1.5842	1.5842	1.5842	
Hardness	110.0	109.9	109.9	109.9	109.9	109.9	109.9	109.9	
K	2.7	1.3	1.3	1.3	1.3	1.3	1.3	1.3	
Mg	10.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
Mn	0.0086	0.1483	0.1483	0.1483	0.1483	0.1483	0.1483	0.1483	
Na	4.8	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Ni	0.0005	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	
Ni-Std	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	
Pb	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	
Pb-Std	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.031
Se	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.005
SO ₄	22.1	9.2	9.2	9.2	9.2	9.2	9.2	9.2	
Tl	0.0003	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0043	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	
Zn	0.0073	0.0159	0.0159	0.0159	0.0159	0.0159	0.0159	0.0159	
Zn-Std	0.1149	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	

Notes

- 1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.
- 2) Deterministic Water Quality Predictions at SW-001 does not change during mine operation and closure because it is upstream of the mine.

Table 5-7. Deterministic Water Quality Predictions at surface water monitoring station SW-002 (mg/L)

Partridge River SW-002

Low Flow Conditions - Mine Site - Proposed Action

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.001
Al	0.0459	0.0550	0.0540	0.0527	0.0523	0.0501	0.0501	0.0506	0.125
As	0.0010	0.0050	0.0050	0.0051	0.0051	0.0052	0.0052	0.0052	0.053
B	0.0585	0.0928	0.0929	0.0930	0.0931	0.0933	0.0933	0.0932	0.5
Ba	0.0096	0.0109	0.0108	0.0106	0.0105	0.0102	0.0102	0.0102	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	24.5	21.1	21.2	21.3	21.3	21.5	21.5	21.5	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0012	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	
Cl	1.8	3.4	3.3	3.2	3.2	3.1	3.1	3.1	230
Co	0.0005	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.005
Cu	0.0005	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	
Cu-Std	0.0103	0.0089	0.0089	0.0090	0.0090	0.0091	0.0091	0.0091	
F	0.1100	0.1891	0.1877	0.1860	0.1856	0.1826	0.1826	0.1833	
Fe	1.2200	1.0160	0.9891	0.9546	0.9456	0.8868	0.8868	0.9000	
Hardness	112.0	94.7	95.1	95.7	95.8	96.7	96.7	96.5	
K	2.0	2.4	2.4	2.4	2.4	2.4	2.4	2.4	
Mg	7.5	9.6	9.7	9.7	9.7	9.7	9.7	9.7	
Mn	0.1420	0.0490	0.0479	0.0465	0.0461	0.0437	0.0437	0.0443	
Na	3.2	7.8	7.7	7.6	7.6	7.4	7.4	7.4	
Ni	0.0008	0.0067	0.0066	0.0064	0.0063	0.0060	0.0060	0.0061	
Ni-Std	0.0574	0.0498	0.0500	0.0503	0.0503	0.0507	0.0507	0.0506	
Pb	0.0003	0.0005	0.0005	0.0005	0.0005	0.0004	0.0004	0.0004	
Pb-Std	0.0037	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.031
Se	0.0005	0.0010	0.0010	0.0010	0.0010	0.0009	0.0009	0.0009	0.005
SO ₄	6.3	19.9	20.0	20.1	20.1	20.2	20.2	20.2	
Tl	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.00056
V	0.0009	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	
Zn	0.0101	0.0144	0.0142	0.0140	0.0139	0.0135	0.0135	0.0136	
Zn-Std	0.1167	0.1012	0.1016	0.1021	0.1022	0.1031	0.1031	0.1029	

Notes

1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 5-8. Deterministic Water Quality Predictions at surface water monitoring station SW-002 (mg/L)

Partridge River SW-002

Average Flow Conditions - Mine Site - Proposed Action

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0459	0.0680	0.0679	0.0677	0.0677	0.0675	0.0674	0.0675	0.125
As	0.0010	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.053
B	0.0585	0.0515	0.0514	0.0513	0.0513	0.0512	0.0513	0.0511	0.5
Ba	0.0096	0.0081	0.0081	0.0081	0.0081	0.0080	0.0080	0.0080	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	24.5	17.6	17.6	17.6	17.6	17.6	17.6	17.6	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	
Cl	1.8	7.4	7.4	7.4	7.4	7.4	7.4	7.4	230
Co	0.0005	0.0006	0.0006	0.0005	0.0005	0.0005	0.0005	0.0005	0.005
Cu	0.0005	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	
Cu-Std	0.0103	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	
F	0.1100	0.0861	0.0858	0.0853	0.0852	0.0844	0.0846	0.0844	
Fe	1.2200	1.5208	1.5181	1.5147	1.5140	1.5091	1.5076	1.5110	
Hardness	112.0	107.9	108.0	108.1	108.1	108.3	108.3	108.3	
K	2.0	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
Mg	7.5	8.2	8.2	8.2	8.2	8.2	8.2	8.2	
Mn	0.1420	0.1363	0.1363	0.1363	0.1363	0.1364	0.1362	0.1366	
Na	3.2	3.2	3.2	3.2	3.2	3.1	3.1	3.1	
Ni	0.0008	0.0023	0.0022	0.0022	0.0022	0.0021	0.0021	0.0021	
Ni-Std	0.0574	0.0556	0.0557	0.0557	0.0557	0.0558	0.0558	0.0558	
Pb	0.0003	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	
Pb-Std	0.0037	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.031
Se	0.0005	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.005
SO ₄	6.3	10.5	10.5	10.5	10.5	10.4	10.5	10.4	
Tl	0.0002	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0009	0.0014	0.0014	0.0013	0.0013	0.0013	0.0013	0.0013	
Zn	0.0101	0.0158	0.0158	0.0157	0.0157	0.0157	0.0157	0.0157	
Zn-Std	0.1167	0.1131	0.1132	0.1132	0.1133	0.1134	0.1134	0.1134	

Notes

- 1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 5-9. Deterministic Water Quality Predictions at surface water monitoring station SW-002 (mg/L)

Partridge River SW-002

High Flow Conditions - Mine Site - Proposed Action

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0459	0.0699	0.0699	0.0699	0.0698	0.0698	0.0698	0.0698	0.125
As	0.0010	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.053
B	0.0585	0.0454	0.0454	0.0454	0.0454	0.0454	0.0454	0.0454	0.5
Ba	0.0096	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	24.5	17.0	17.0	17.0	17.0	17.0	17.0	17.0	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	
Cl	1.8	8.0	8.0	8.0	8.0	8.0	8.0	8.0	230
Co	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.005
Cu	0.0005	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	
Cu-Std	0.0103	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	
F	0.1100	0.0711	0.0710	0.0710	0.0710	0.0709	0.0710	0.0709	
Fe	1.2200	1.5948	1.5946	1.5944	1.5944	1.5941	1.5939	1.5942	
Hardness	112.0	109.9	109.9	109.9	109.9	109.9	109.9	109.9	
K	2.0	1.3	1.3	1.3	1.3	1.3	1.3	1.3	
Mg	7.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
Mn	0.1420	0.1491	0.1491	0.1491	0.1491	0.1491	0.1491	0.1491	
Na	3.2	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Ni	0.0008	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	
Ni-Std	0.0574	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	
Pb	0.0003	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	
Pb-Std	0.0037	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.031
Se	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.005
SO ₄	6.3	9.1	9.1	9.1	9.1	9.1	9.1	9.1	
Tl	0.0002	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	
Zn	0.0101	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	
Zn-Std	0.1167	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	

Notes

1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 5-10. Deterministic Water Quality Predictions at surface water monitoring station SW-003 (mg/L)

Partridge River SW-003

Low Flow Conditions - Mine Site - Proposed Action

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.001
Al	0.0603	0.0596	0.0587	0.0586	0.0590	0.0556	0.0676	0.0614	0.125
As	0.0010	0.0048	0.0048	0.0049	0.0049	0.0050	0.0056	0.0051	0.053
B	0.0661	0.0925	0.0925	0.0927	0.0927	0.0922	0.0945	0.0937	0.5
Ba	0.0100	0.0116	0.0115	0.0113	0.0113	0.0109	0.0120	0.0112	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	20.7	20.7	20.8	20.9	20.9	21.0	22.1	21.5	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	
Cl	10.5	3.6	3.5	3.5	3.5	3.3	3.8	3.7	230
Co	0.0005	0.0010	0.0009	0.0016	0.0018	0.0014	0.0015	0.0014	0.005
Cu	0.0011	0.0019	0.0019	0.0048	0.0061	0.0042	0.0048	0.0046	
Cu-Std	0.0094	0.0088	0.0088	0.0088	0.0088	0.0089	0.0092	0.0090	
F	0.0900	0.1950	0.1938	0.1922	0.1919	0.1877	0.2340	0.2341	
Fe	1.6300	1.1357	1.1107	1.0810	1.0786	1.0116	1.0174	1.0344	
Hardness	101.1	92.9	93.3	93.8	93.9	94.1	97.9	96.0	
K	2.0	2.3	2.3	2.3	2.3	2.4	2.5	2.5	
Mg	9.0	9.5	9.5	9.6	9.6	9.6	9.8	9.7	
Mn	0.1920	0.0539	0.0529	0.0523	0.0524	0.0492	0.0516	0.0512	
Na	3.8	8.2	8.1	8.0	8.0	7.7	11.8	10.8	
Ni	0.0016	0.0073	0.0072	0.0181	0.0229	0.0155	0.0161	0.0156	
Ni-Std	0.0526	0.0490	0.0492	0.0494	0.0495	0.0496	0.0512	0.0504	
Pb	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.0005	
Pb-Std	0.0032	0.0029	0.0029	0.0029	0.0029	0.0029	0.0031	0.0030	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0021	0.0017	0.031
Se	0.0005	0.0011	0.0010	0.0010	0.0010	0.0010	0.0011	0.0011	0.005
SO ₄	10.9	19.7	19.8	20.0	20.0	19.9	22.2	21.1	
Tl	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.00056
V	0.0009	0.0043	0.0043	0.0043	0.0044	0.0045	0.0053	0.0047	
Zn	0.0064	0.0153	0.0151	0.0152	0.0154	0.0146	0.0158	0.0149	
Zn-Std	0.1070	0.0996	0.0999	0.1004	0.1005	0.1007	0.1041	0.1024	

Notes

1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 5-11. Deterministic Deterministic Water Quality Predictions at surface water monitoring station SW-003 (mg/L)

Partridge River SW-003

Average Flow Conditions - Mine Site - Proposed Action

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0603	0.0687	0.0686	0.0687	0.0688	0.0684	0.0698	0.0689	0.125
As	0.0010	0.0024	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.053
B	0.0661	0.0510	0.0509	0.0509	0.0509	0.0507	0.0510	0.0508	0.5
Ba	0.0100	0.0082	0.0082	0.0081	0.0081	0.0081	0.0082	0.0081	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	20.7	17.5	17.5	17.5	17.5	17.5	17.6	17.5	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0011	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	
Cl	10.5	7.4	7.4	7.4	7.4	7.4	7.5	7.5	230
Co	0.0005	0.0006	0.0006	0.0007	0.0007	0.0007	0.0007	0.0007	0.005
Cu	0.0011	0.0017	0.0017	0.0023	0.0026	0.0023	0.0024	0.0023	
Cu-Std	0.0094	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	
F	0.0900	0.0857	0.0854	0.0851	0.0850	0.0841	0.0902	0.0886	
Fe	1.6300	1.5415	1.5389	1.5359	1.5359	1.5298	1.5294	1.5330	
Hardness	101.1	107.8	107.9	108.0	108.0	108.1	108.6	108.3	
K	2.0	1.4	1.4	1.4	1.4	1.4	1.5	1.4	
Mg	9.0	8.2	8.2	8.2	8.2	8.2	8.2	8.2	
Mn	0.1920	0.1379	0.1379	0.1380	0.1381	0.1380	0.1381	0.1383	
Na	3.8	3.2	3.2	3.2	3.2	3.1	3.7	3.4	
Ni	0.0016	0.0023	0.0023	0.0037	0.0051	0.0043	0.0044	0.0042	
Ni-Std	0.0526	0.0556	0.0556	0.0557	0.0557	0.0557	0.0559	0.0558	
Pb	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	
Pb-Std	0.0032	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0016	0.0015	0.031
Se	0.0005	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.005
SO ₄	10.9	10.3	10.3	10.4	10.4	10.3	10.6	10.4	
Tl	0.0002	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0009	0.0013	0.0013	0.0013	0.0013	0.0013	0.0014	0.0014	
Zn	0.0064	0.0159	0.0159	0.0159	0.0160	0.0159	0.0160	0.0159	
Zn-Std	0.1070	0.1130	0.1131	0.1132	0.1132	0.1132	0.1136	0.1134	

Notes

- 1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 5-12. Deterministic Deterministic Water Quality Predictions at surface water monitoring station SW-003 (mg/L)

Partridge River SW-003

High Flow Conditions - Mine Site - Proposed Action

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0603	0.0699	0.0699	0.0700	0.0701	0.0700	0.0701	0.0701	0.125
As	0.0010	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.053
B	0.0661	0.0453	0.0453	0.0453	0.0453	0.0453	0.0453	0.0453	0.5
Ba	0.0100	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	20.7	17.0	17.0	17.0	17.0	17.0	17.0	17.0	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0011	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	
Cl	10.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	230
Co	0.0005	0.0005	0.0005	0.0006	0.0006	0.0006	0.0006	0.0006	0.005
Cu	0.0011	0.0017	0.0017	0.0020	0.0021	0.0020	0.0020	0.0020	
Cu-Std	0.0094	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	
F	0.0900	0.0709	0.0709	0.0709	0.0709	0.0708	0.0710	0.0709	
Fe	1.6300	1.5967	1.5965	1.5965	1.5966	1.5963	1.5963	1.5965	
Hardness	101.1	109.9	109.9	109.9	109.9	109.9	109.9	109.9	
K	2.0	1.3	1.3	1.3	1.3	1.3	1.3	1.3	
Mg	9.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
Mn	0.1920	0.1493	0.1493	0.1494	0.1494	0.1494	0.1494	0.1494	
Na	3.8	2.5	2.5	2.5	2.5	2.5	2.6	2.5	
Ni	0.0016	0.0016	0.0016	0.0022	0.0028	0.0027	0.0027	0.0027	
Ni-Std	0.0526	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	
Pb	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	
Pb-Std	0.0032	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.031
Se	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.005
SO ₄	10.9	9.1	9.1	9.1	9.1	9.1	9.1	9.1	
Tl	0.0002	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	
Zn	0.0064	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	
Zn-Std	0.1070	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	

Notes

- 1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 5-13. Deterministic Water Quality Predictions at surface water monitoring station SW-004 (mg/L)

Partridge River SW-004

Low Flow Conditions - Mine Site - Proposed Action

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.001
Al	0.0713	0.0861	0.0858	0.0868	0.0869	0.0837	0.0867	0.0748	0.125
As	0.0010	0.0042	0.0043	0.0043	0.0043	0.0043	0.0055	0.0066	0.053
B	0.0611	0.0902	0.0903	0.0903	0.0903	0.0894	0.0947	0.0967	0.5
Ba	0.0050	0.0135	0.0134	0.0132	0.0132	0.0128	0.0144	0.0148	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	20.7	19.2	19.3	19.4	19.4	19.3	21.8	22.3	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0011	0.0010	0.0010	0.0010	0.0010	0.0010	0.0011	0.0011	
Cl	9.1	4.1	4.1	4.0	4.0	3.9	4.7	4.7	230
Co	0.0005	0.0011	0.0011	0.0019	0.0021	0.0015	0.0016	0.0017	0.005
Cu	0.0021	0.0030	0.0030	0.0059	0.0070	0.0052	0.0055	0.0051	
Cu-Std	0.0088	0.0082	0.0083	0.0083	0.0083	0.0083	0.0090	0.0091	
F	0.0900	0.2096	0.2086	0.2075	0.2074	0.2027	0.2786	0.2997	
Fe	1.3400	1.3609	1.3390	1.3158	1.3167	1.2526	1.3141	1.3069	
Hardness	92.9	86.5	86.8	87.3	87.3	86.8	95.4	97.0	
K	1.6	2.2	2.2	2.3	2.3	2.2	2.6	2.7	
Mg	8.3	9.1	9.1	9.1	9.1	9.1	9.6	9.7	
Mn	0.1290	0.0698	0.0691	0.0691	0.0692	0.0661	0.0651	0.0629	
Na	3.5	8.8	8.7	8.7	8.7	8.4	15.3	17.0	
Ni	0.0019	0.0088	0.0091	0.0218	0.0256	0.0172	0.0179	0.0182	
Ni-Std	0.0490	0.0461	0.0463	0.0465	0.0465	0.0463	0.0501	0.0508	
Pb	0.0002	0.0006	0.0006	0.0006	0.0006	0.0006	0.0007	0.0008	
Pb-Std	0.0029	0.0026	0.0027	0.0027	0.0027	0.0027	0.0030	0.0031	
Sb	0.0015	0.0014	0.0014	0.0014	0.0014	0.0014	0.0025	0.0043	0.031
Se	0.0005	0.0012	0.0011	0.0011	0.0011	0.0011	0.0014	0.0014	0.005
SO ₄	10.0	19.9	20.0	20.2	20.2	20.0	23.0	26.0	
Tl	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.00056
V	0.0009	0.0042	0.0042	0.0043	0.0043	0.0043	0.0057	0.0060	
Zn	0.0192	0.0167	0.0166	0.0170	0.0170	0.0161	0.0186	0.0176	
Zn-Std	0.0996	0.0937	0.0940	0.0944	0.0944	0.0941	0.1018	0.1033	

Notes

1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 5-14. Deterministic Water Quality Predictions at surface water monitoring station SW-004 (mg/L)

Partridge River SW-004

Average Flow Conditions - Mine Site - Proposed Action

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0713	0.0717	0.0717	0.0718	0.0719	0.0715	0.0717	0.0703	0.125
As	0.0010	0.0023	0.0023	0.0023	0.0023	0.0023	0.0024	0.0026	0.053
B	0.0611	0.0498	0.0498	0.0497	0.0498	0.0496	0.0499	0.0501	0.5
Ba	0.0050	0.0083	0.0083	0.0083	0.0083	0.0082	0.0083	0.0084	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	20.7	17.2	17.2	17.3	17.3	17.2	17.5	17.5	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0011	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	
Cl	9.1	7.6	7.6	7.6	7.6	7.6	7.7	7.7	230
Co	0.0005	0.0006	0.0006	0.0007	0.0007	0.0007	0.0007	0.0007	0.005
Cu	0.0021	0.0018	0.0018	0.0023	0.0026	0.0023	0.0023	0.0022	
Cu-Std	0.0088	0.0099	0.0099	0.0099	0.0099	0.0099	0.0100	0.0100	
F	0.0900	0.0848	0.0846	0.0844	0.0844	0.0837	0.0906	0.0932	
Fe	1.3400	1.5746	1.5725	1.5703	1.5703	1.5646	1.5723	1.5715	
Hardness	92.9	107.5	107.5	107.6	107.6	107.6	108.6	108.7	
K	1.6	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
Mg	8.3	8.1	8.1	8.1	8.1	8.1	8.2	8.2	
Mn	0.1290	0.1415	0.1415	0.1416	0.1416	0.1414	0.1418	0.1415	
Na	3.5	3.2	3.2	3.1	3.1	3.1	3.9	3.9	
Ni	0.0019	0.0023	0.0024	0.0038	0.0049	0.0040	0.0040	0.0039	
Ni-Std	0.0490	0.0555	0.0555	0.0555	0.0555	0.0555	0.0559	0.0560	
Pb	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	
Pb-Std	0.0029	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0016	0.0017	0.031
Se	0.0005	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.005
SO ₄	10.0	10.2	10.2	10.2	10.2	10.1	10.4	10.5	
Tl	0.0002	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0009	0.0012	0.0012	0.0013	0.0013	0.0013	0.0014	0.0014	
Zn	0.0192	0.0161	0.0161	0.0161	0.0161	0.0160	0.0163	0.0162	
Zn-Std	0.0996	0.1127	0.1127	0.1128	0.1128	0.1128	0.1137	0.1138	

Notes

1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 5-15. Deterministic Water Quality Predictions at surface water monitoring station SW-004 (mg/L)

Partridge River SW-004

High Flow Conditions - Mine Site - Proposed Action

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0713	0.0701	0.0702	0.0703	0.0704	0.0703	0.0703	0.0702	0.125
As	0.0010	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0022	0.053
B	0.0611	0.0453	0.0453	0.0453	0.0453	0.0453	0.0453	0.0453	0.5
Ba	0.0050	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	20.7	17.0	17.0	17.0	17.0	17.0	17.0	17.0	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0011	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	
Cl	9.1	8.0	8.0	8.0	8.0	8.0	8.0	8.0	230
Co	0.0005	0.0005	0.0005	0.0006	0.0006	0.0006	0.0006	0.0006	0.005
Cu	0.0021	0.0017	0.0017	0.0020	0.0023	0.0021	0.0021	0.0021	
Cu-Std	0.0088	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	
F	0.0900	0.0710	0.0710	0.0710	0.0710	0.0709	0.0712	0.0712	
Fe	1.3400	1.5983	1.5984	1.5984	1.5986	1.5982	1.5986	1.5985	
Hardness	92.9	109.8	109.8	109.8	109.9	109.9	109.9	109.9	
K	1.6	1.3	1.3	1.3	1.3	1.3	1.3	1.3	
Mg	8.3	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
Mn	0.1290	0.1494	0.1494	0.1495	0.1496	0.1495	0.1495	0.1495	
Na	3.5	2.5	2.5	2.5	2.5	2.5	2.6	2.6	
Ni	0.0019	0.0016	0.0017	0.0025	0.0034	0.0031	0.0030	0.0030	
Ni-Std	0.0490	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	
Pb	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	
Pb-Std	0.0029	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.031
Se	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.005
SO ₄	10.0	9.1	9.1	9.1	9.1	9.1	9.1	9.1	
Tl	0.0002	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	
Zn	0.0192	0.0160	0.0160	0.0161	0.0161	0.0161	0.0161	0.0161	
Zn-Std	0.0996	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	

Notes

1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 5-16. Deterministic Water Quality Predictions at surface water monitoring station SW-004a (mg/L)

Partridge River SW-004a

Low Flow Conditions - Mine Site - Proposed Action

Parameter	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.001
Al	0.1051	0.1054	0.1050	0.1058	0.1042	0.1064	0.0973	0.125
As	0.0034	0.0034	0.0043	0.0047	0.0047	0.0054	0.0083	0.053
B	0.0884	0.0879	0.0890	0.0895	0.0889	0.0919	0.0970	0.5
Ba	0.0169	0.0168	0.0170	0.0171	0.0168	0.0179	0.0199	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	
Ca	17.4	17.4	18.1	18.4	18.4	19.7	21.9	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0009	0.0009	0.0010	0.0010	0.0010	0.0010	0.0011	
Cl	5.1	5.1	5.1	5.0	5.0	5.5	5.6	230
Co	0.0013	0.0013	0.0018	0.0020	0.0017	0.0017	0.0019	0.005
Cu	0.0032	0.0034	0.0050	0.0056	0.0046	0.0047	0.0046	
Cu-Std	0.0075	0.0075	0.0078	0.0078	0.0078	0.0082	0.0087	
F	0.2388	0.2402	0.2398	0.2392	0.2369	0.2807	0.3178	
Fe	1.9301	1.9041	1.9116	1.9164	1.8845	1.9376	1.8787	
Hardness	78.0	78.1	80.7	81.6	81.3	86.0	92.5	
K	2.1	2.1	2.1	2.2	2.2	2.3	2.7	
Mg	8.6	8.6	8.8	8.8	8.8	9.1	9.4	
Mn	0.0925	0.0924	0.0927	0.0931	0.0916	0.0918	0.0881	
Na	10.5	10.5	11.2	11.7	11.6	15.6	20.3	
Ni	0.0118	0.0121	0.0198	0.0224	0.0175	0.0179	0.0194	
Ni-Std	0.0423	0.0423	0.0435	0.0439	0.0438	0.0459	0.0488	
Pb	0.0008	0.0008	0.0008	0.0009	0.0009	0.0009	0.0011	
Pb-Std	0.0023	0.0023	0.0024	0.0025	0.0024	0.0026	0.0029	
Sb	0.0014	0.0014	0.0015	0.0016	0.0016	0.0022	0.0061	0.031
Se	0.0015	0.0015	0.0015	0.0015	0.0014	0.0016	0.0017	0.005
SO ₄	18.8	19.3	20.9	23.0	22.9	24.7	31.7	
Tl	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00056
V	0.0042	0.0042	0.0053	0.0068	0.0068	0.0077	0.0090	
Zn	0.0208	0.0206	0.0211	0.0212	0.0207	0.0223	0.0220	
Zn-Std	0.0859	0.0859	0.0884	0.0892	0.0889	0.0933	0.0993	

Notes

1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 5-17. Deterministic Water Quality Predictions at surface water monitoring station SW-004a (mg/L)

Partridge River SW-004a

Average Flow Conditions - Mine Site - Proposed Action

Parameter	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.001
Al	0.0728	0.0728	0.0728	0.0730	0.0728	0.0729	0.0696	0.125
As	0.0022	0.0022	0.0023	0.0024	0.0023	0.0024	0.0076	0.053
B	0.0484	0.0484	0.0485	0.0485	0.0484	0.0486	0.0600	0.5
Ba	0.0084	0.0084	0.0084	0.0084	0.0084	0.0085	0.0127	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	17.0	17.0	17.1	17.1	17.1	17.2	21.3	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0013	
Cl	7.8	7.8	7.8	7.8	7.8	7.8	8.5	230
Co	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0009	0.005
Cu	0.0018	0.0018	0.0020	0.0022	0.0020	0.0020	0.0022	
Cu-Std	0.0099	0.0099	0.0099	0.0099	0.0099	0.0100	0.0109	
F	0.0833	0.0836	0.0835	0.0835	0.0831	0.0863	0.1954	
Fe	1.6258	1.6238	1.6240	1.6243	1.6216	1.6252	1.5476	
Hardness	107.5	107.5	107.6	107.8	107.8	108.2	119.4	
K	1.4	1.4	1.4	1.4	1.4	1.4	2.2	
Mg	8.0	8.0	8.1	8.1	8.1	8.1	8.7	
Mn	0.1455	0.1454	0.1455	0.1455	0.1455	0.1456	0.1387	
Na	3.1	3.1	3.2	3.2	3.2	3.5	14.4	
Ni	0.0024	0.0024	0.0030	0.0035	0.0031	0.0031	0.0057	
Ni-Std	0.0554	0.0554	0.0555	0.0556	0.0556	0.0558	0.0606	
Pb	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0008	
Pb-Std	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	0.0040	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0016	0.0069	0.0310
Se	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0009	0.005
SO ₄	9.8	9.8	9.9	10.0	10.0	10.1	18.3	
Tl	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0012	0.0012	0.0012	0.0013	0.0013	0.0013	0.0043	
Zn	0.0164	0.0164	0.0164	0.0164	0.0164	0.0165	0.0178	
Zn-Std	0.1127	0.1127	0.1128	0.1129	0.1130	0.1133	0.1232	

Notes

1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 5-18. Deterministic Water Quality Predictions at surface water monitoring station SW-004a (mg/L)

Partridge River SW-004a

High Flow Conditions - Mine Site - Proposed Action

Parameter	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0701	0.0702	0.0702	0.0703	0.0702	0.0702	0.0694	0.125
As	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0049	0.053
B	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0492	0.5
Ba	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0091	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	17.0	17.0	17.0	17.0	17.0	17.0	18.3	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0013	
Cl	8.0	8.0	8.0	8.0	8.0	8.0	8.0	230
Co	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.005
Cu	0.0017	0.0017	0.0018	0.0019	0.0018	0.0018	0.0019	
Cu-Std	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0104	
F	0.0707	0.0707	0.0707	0.0707	0.0707	0.0708	0.0847	
Fe	1.6012	1.6012	1.6011	1.6012	1.6010	1.6011	1.5799	
Hardness	109.9	109.9	109.9	109.9	109.9	109.9	113.5	
K	1.3	1.3	1.3	1.3	1.3	1.3	1.6	
Mg	8.0	8.0	8.0	8.0	8.0	8.0	8.2	
Mn	0.1498	0.1498	0.1498	0.1498	0.1498	0.1498	0.1478	
Na	2.5	2.5	2.5	2.5	2.5	2.6	4.8	
Ni	0.0016	0.0016	0.0019	0.0022	0.0021	0.0021	0.0029	
Ni-Std	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	0.0581	
Pb	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	
Pb-Std	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0037	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0030	0.031
Se	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.005
SO ₄	9.0	9.0	9.1	9.1	9.1	9.1	11.9	
Tl	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0020	
Zn	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0165	
Zn-Std	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	0.1180	

Notes

1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 5-19. Deterministic Water Quality Predictions at surface water monitoring station SW-005 (mg/L)

Partridge River SW-005

Low Flow Conditions - Mine Site - Proposed Action

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.001
Al	0.1162	0.1129	0.1131	0.1129	0.1134	0.1125	0.1140	0.1083	0.125
As	0.0010	0.0029	0.0029	0.0035	0.0037	0.0037	0.0041	0.0058	0.053
B	0.0372	0.0878	0.0875	0.0882	0.0885	0.0882	0.0899	0.0931	0.5
Ba	0.0088	0.0189	0.0188	0.0189	0.0190	0.0189	0.0195	0.0207	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	
Ca	18.6	16.4	16.4	16.8	17.0	16.9	17.7	19.1	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0010	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0010	
Cl	6.2	5.7	5.7	5.7	5.7	5.6	5.9	6.0	230
Co	0.0006	0.0014	0.0014	0.0018	0.0019	0.0017	0.0017	0.0018	0.005
Cu	0.0017	0.0031	0.0032	0.0042	0.0046	0.0039	0.0040	0.0039	
Cu-Std	0.0079	0.0072	0.0072	0.0073	0.0073	0.0073	0.0075	0.0079	
F	0.0900	0.2550	0.2558	0.2558	0.2555	0.2541	0.2804	0.3028	
Fe	1.9900	2.2889	2.2732	2.2822	2.2854	2.2691	2.3071	2.2617	
Hardness	82.9	73.5	73.5	75.0	75.6	75.3	78.0	82.2	
K	1.0	1.9	2.0	2.0	2.0	2.0	2.1	2.3	
Mg	7.5	8.4	8.4	8.5	8.5	8.5	8.7	8.8	
Mn	0.1990	0.1048	0.1048	0.1052	0.1054	0.1046	0.1049	0.1023	
Na	2.9	11.6	11.6	12.1	12.4	12.3	14.7	17.5	
Ni	0.0021	0.0136	0.0137	0.0184	0.0200	0.0170	0.0173	0.0182	
Ni-Std	0.0445	0.0402	0.0402	0.0409	0.0411	0.0411	0.0423	0.0442	
Pb	0.0008	0.0009	0.0009	0.0010	0.0010	0.0010	0.0010	0.0011	
Pb-Std	0.0025	0.0021	0.0021	0.0022	0.0022	0.0022	0.0023	0.0025	
Sb	0.0015	0.0015	0.0015	0.0015	0.0016	0.0016	0.0019	0.0043	0.031
Se	0.0005	0.0016	0.0016	0.0016	0.0016	0.0016	0.0017	0.0018	0.005
SO ₄	9.0	17.8	18.1	19.0	20.3	20.2	21.2	25.5	
Tl	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00056
V	0.0009	0.0042	0.0042	0.0049	0.0058	0.0058	0.0063	0.0071	
Zn	0.0167	0.0234	0.0233	0.0236	0.0237	0.0234	0.0244	0.0242	
Zn-Std	0.0904	0.0816	0.0817	0.0831	0.0836	0.0834	0.0859	0.0898	

Notes

1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 5-20. Deterministic Water Quality Predictions at surface water monitoring station SW-005 (mg/L)

Partridge River SW-005

Average Flow Conditions - Mine Site - Proposed Action

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.1162	0.0730	0.0730	0.0730	0.0731	0.0730	0.0731	0.0712	0.125
As	0.0010	0.0022	0.0022	0.0022	0.0022	0.0022	0.0023	0.0051	0.053
B	0.0372	0.0480	0.0480	0.0480	0.0480	0.0480	0.0481	0.0544	0.5
Ba	0.0088	0.0085	0.0085	0.0085	0.0085	0.0085	0.0085	0.0108	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	18.6	17.0	17.0	17.0	17.0	17.0	17.1	19.3	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0010	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0013	
Cl	6.2	7.8	7.8	7.8	7.8	7.8	7.9	8.2	230
Co	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0007	0.005
Cu	0.0017	0.0018	0.0018	0.0019	0.0020	0.0019	0.0019	0.0020	
Cu-Std	0.0079	0.0099	0.0099	0.0099	0.0099	0.0099	0.0100	0.0104	
F	0.0900	0.0829	0.0830	0.0830	0.0830	0.0828	0.0845	0.1447	
Fe	1.9900	1.6478	1.6469	1.6472	1.6474	1.6459	1.6479	1.6041	
Hardness	82.9	107.5	107.4	107.5	107.6	107.6	107.8	114.0	
K	1.0	1.3	1.3	1.3	1.4	1.3	1.4	1.8	
Mg	7.5	8.0	8.0	8.0	8.0	8.0	8.0	8.4	
Mn	0.1990	0.1469	0.1468	0.1469	0.1469	0.1469	0.1469	0.1431	
Na	2.9	3.1	3.1	3.2	3.2	3.2	3.3	9.3	
Ni	0.0021	0.0024	0.0024	0.0028	0.0030	0.0028	0.0028	0.0042	
Ni-Std	0.0445	0.0554	0.0554	0.0555	0.0555	0.0555	0.0556	0.0583	
Pb	0.0008	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0007	
Pb-Std	0.0025	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	0.0038	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0045	0.031
Se	0.0005	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0008	0.005
SO ₄	9.0	9.6	9.6	9.7	9.7	9.7	9.8	14.3	
Tl	0.0002	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0009	0.0011	0.0011	0.0012	0.0012	0.0012	0.0012	0.0029	
Zn	0.0167	0.0165	0.0165	0.0165	0.0165	0.0165	0.0166	0.0173	
Zn-Std	0.0904	0.1127	0.1126	0.1127	0.1128	0.1128	0.1130	0.1185	

Notes

1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 5-21. Deterministic Water Quality Predictions at surface water monitoring station SW-005 (mg/L)

Partridge River SW-005

High Flow Conditions - Mine Site - Proposed Action

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.1162	0.0702	0.0702	0.0703	0.0703	0.0703	0.0703	0.0696	0.125
As	0.0010	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0046	0.053
B	0.0372	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0488	0.5
Ba	0.0088	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0090	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	18.6	17.0	17.0	17.0	17.0	17.0	17.0	18.2	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0010	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	
Cl	6.2	8.0	8.0	8.0	8.0	8.0	8.0	8.0	230
Co	0.0006	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.005
Cu	0.0017	0.0017	0.0017	0.0018	0.0019	0.0018	0.0018	0.0019	
Cu-Std	0.0079	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0104	
F	0.0900	0.0710	0.0710	0.0710	0.0710	0.0710	0.0711	0.0833	
Fe	1.9900	1.6036	1.6036	1.6035	1.6036	1.6035	1.6036	1.5847	
Hardness	82.9	109.8	109.8	109.8	109.8	109.8	109.8	113.0	
K	1.0	1.3	1.3	1.3	1.3	1.3	1.3	1.5	
Mg	7.5	8.0	8.0	8.0	8.0	8.0	8.0	8.2	
Mn	0.1990	0.1498	0.1498	0.1498	0.1498	0.1498	0.1498	0.1481	
Na	2.9	2.5	2.5	2.6	2.6	2.6	2.6	4.5	
Ni	0.0021	0.0016	0.0016	0.0019	0.0021	0.0020	0.0020	0.0028	
Ni-Std	0.0445	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	0.0578	
Pb	0.0008	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	
Pb-Std	0.0025	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0037	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0028	0.031
Se	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.005
SO ₄	9.0	9.0	9.1	9.1	9.1	9.1	9.1	11.6	
Tl	0.0002	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0019	
Zn	0.0167	0.0160	0.0160	0.0161	0.0161	0.0161	0.0161	0.0165	
Zn-Std	0.0904	0.1147	0.1147	0.1148	0.1148	0.1148	0.1148	0.1176	

Notes

1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 5-22. Deterministic Water Quality Predictions at USGS gage (surface water monitoring station SW-006) (mg/L)

Partridge River USGS Gage SW-006

Low Flow Conditions - Mine Site - Proposed Action

Parameter	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.001
Al	0.1138	0.1140	0.1139	0.1143	0.1135	0.1149	0.1096	0.125
As	0.0028	0.0028	0.0034	0.0036	0.0036	0.0039	0.0056	0.053
B	0.0878	0.0875	0.0881	0.0884	0.0881	0.0897	0.0926	0.5
Ba	0.0191	0.0190	0.0192	0.0192	0.0191	0.0197	0.0208	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	16.2	16.2	16.7	16.8	16.8	17.5	18.8	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0010	
Cl	5.8	5.74	5.75	5.7	5.7	6.0	6.1	230
Co	0.0015	0.0015	0.0017	0.0018	0.0017	0.0017	0.0018	0.005
Cu	0.0031	0.0032	0.0041	0.0044	0.0039	0.0039	0.0038	
Cu-Std	0.0071	0.0071	0.0072	0.0073	0.0073	0.0075	0.0078	
F	0.2569	0.2576	0.2576	0.2573	0.2561	0.2804	0.3010	
Fe	2.3306	2.3161	2.3249	2.3279	2.3131	2.3489	2.3060	
Hardness	72.9	73.0	74.4	74.9	74.7	77.1	81.0	
K	1.9	1.9	2.0	2.0	2.0	2.1	2.3	
Mg	8.4	8.4	8.4	8.5	8.4	8.6	8.8	
Mn	0.1063	0.1063	0.1066	0.1068	0.1061	0.1064	0.1040	
Na	11.8	11.7	12.2	12.4	12.4	14.6	17.2	
Ni	0.0138	0.0139	0.0182	0.0197	0.0170	0.0172	0.0180	
Pb	0.0010	0.0009	0.0010	0.0010	0.0010	0.0010	0.0011	
Pb-Std	0.0021	0.0021	0.0022	0.0022	0.0022	0.0023	0.0024	
Sb	0.0015	0.0015	0.0015	0.0016	0.0015	0.0019	0.0040	0.031
Se	0.0017	0.0017	0.0017	0.0017	0.0017	0.0018	0.0018	0.005
SO ₄	17.6	17.9	18.8	19.9	19.9	20.8	24.8	
Tl	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.00056
V	0.0042	0.0042	0.0049	0.0057	0.0057	0.0061	0.0069	
Zn	0.0237	0.0236	0.0239	0.0240	0.0237	0.0246	0.0244	
Zn-Std	0.0811	0.0812	0.0825	0.0829	0.0827	0.0850	0.0886	

Notes

1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 5-23. Deterministic Water Quality Predictions at USGS gage (surface water monitoring station SW-006) (mg/L)

Partridge River USGS Gage SW-006

Average Flow Conditions - Mine Site - Proposed Action

Parameter	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0731	0.0732	0.0732	0.0733	0.0732	0.0732	0.0714	0.125
As	0.0022	0.0022	0.0022	0.0022	0.0022	0.0023	0.0050	0.053
B	0.0481	0.0481	0.0481	0.0481	0.0481	0.0482	0.0542	0.5
Ba	0.0085	0.0085	0.0085	0.0085	0.0085	0.0085	0.0107	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	16.9	16.9	17.0	17.0	17.0	17.0	19.2	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0013	
Cl	7.8	7.8	7.8	7.8	7.8	7.9	8.2	230
Co	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0007	0.005
Cu	0.0018	0.0018	0.0019	0.0020	0.0019	0.0019	0.0020	
Cu-Std	0.0099	0.0099	0.0099	0.0099	0.0099	0.0099	0.0104	
F	0.0834	0.0835	0.0835	0.0835	0.0833	0.0849	0.1422	
Fe	1.6521	1.6513	1.6516	1.6518	1.6504	1.6522	1.6104	
Hardness	107.4	107.3	107.4	107.5	107.5	107.7	113.6	
K	1.3	1.3	1.3	1.4	1.3	1.4	1.8	
Mg	8.0	8.0	8.0	8.0	8.0	8.0	8.4	
Mn	0.1469	0.1469	0.1469	0.1469	0.1469	0.1469	0.1433	
Na	3.2	3.2	3.2	3.2	3.2	3.4	9.1	
Ni	0.0024	0.0024	0.0028	0.0030	0.0028	0.0028	0.0042	
Ni-Std	0.0554	0.0554	0.0554	0.0555	0.0555	0.0555	0.0581	
Pb	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0007	
Pb-Std	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	0.0037	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0043	0.031
Se	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0008	0.005
SO ₄	9.6	9.6	9.7	9.7	9.7	9.8	14.1	
Tl	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0011	0.0011	0.0012	0.0012	0.0012	0.0012	0.0028	
Zn	0.0166	0.0165	0.0166	0.0166	0.0166	0.0166	0.0173	
Zn-Std	0.1126	0.1126	0.1126	0.1127	0.1127	0.1129	0.1181	

Notes

1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 5-24. Deterministic Water Quality Predictions at USGS gage (surface water monitoring station SW-006) (mg/L)

Partridge River USGS Gage SW-006

High Flow Conditions - Mine Site - Proposed Action

Parameter	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0703	0.0703	0.0703	0.0704	0.0703	0.0703	0.0697	0.125
As	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0046	0.053
B	0.0452	0.0452	0.0453	0.0453	0.0453	0.0453	0.0489	0.5
Ba	0.0077	0.0077	0.0077	0.0077	0.0077	0.0078	0.0090	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	17.0	17.0	17.0	17.0	17.0	17.0	18.2	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	
Cl	8.0	8.0	8.0	8.0	8.0	8.0	8.0	230
Co	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.005
Cu	0.0017	0.0017	0.0018	0.0019	0.0018	0.0018	0.0019	
Cu-Std	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0104	
F	0.0711	0.0711	0.0711	0.0711	0.0711	0.0712	0.0835	
Fe	1.6041	1.6041	1.6040	1.6041	1.6040	1.6041	1.5871	
Hardness	109.8	109.8	109.8	109.8	109.8	109.8	113.1	
K	1.3	1.3	1.3	1.3	1.3	1.3	1.5	
Mg	8.0	8.0	8.0	8.0	8.0	8.0	8.2	
Mn	0.1497	0.1498	0.1498	0.1498	0.1498	0.1498	0.1482	
Na	2.6	2.6	2.6	2.6	2.6	2.6	4.6	
Ni	0.0016	0.0016	0.0019	0.0021	0.0020	0.0020	0.0028	
Ni-Std	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	0.0579	
Pb	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	
Pb-Std	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0037	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0028	0.031
Se	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.005
SO ₄	9.1	9.1	9.1	9.1	9.1	9.1	11.6	
Tl	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0019	
Zn	0.0160	0.0161	0.0161	0.0161	0.0161	0.0161	0.0165	
Zn-Std	0.1147	0.1147	0.1147	0.1147	0.1147	0.1148	0.1177	

Notes

1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 5-25. Deterministic Water Quality Predictions in Colby Lake (mg/L)

Colby Lake

Low Flow Conditions - Mine Site - Proposed Action

Parameter	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Standard (Reference Hardness = 100 mg/L)
Ag	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001
Al	0.0763	0.0764	0.0763	0.0764	0.0763	0.0763	0.0748	0.125
As	0.0022	0.0022	0.0023	0.0023	0.0023	0.0023	0.0042	0.01
B	0.0509	0.0509	0.0509	0.0510	0.0509	0.0510	0.0552	
Ba	0.0093	0.0093	0.0093	0.0093	0.0093	0.0094	0.0111	2
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.004
Ca	16.9	16.9	16.9	16.9	16.9	17.0	18.6	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0011
Cl	7.7	7.7	7.7	7.7	7.7	7.7	7.8	230
Co	0.0006	0.0006	0.0007	0.0007	0.0007	0.0007	0.0008	0.0028
Cu	0.0020	0.0020	0.0021	0.0022	0.0021	0.0021	0.0022	0.0093
F	0.0965	0.0967	0.0965	0.0965	0.0962	0.0987	0.1239	2
Fe	1.7130	1.7114	1.7117	1.7120	1.7097	1.7127	1.6809	0.3
Hardness	104.7	104.7	104.9	104.9	104.9	105.3	109.4	500
K	1.4	1.4	1.4	1.4	1.4	1.4	1.7	
Mg	8.0	8.0	8.1	8.1	8.1	8.1	8.3	
Mn	0.1443	0.1443	0.1444	0.1444	0.1443	0.1444	0.1416	
Na	3.8	3.8	3.9	3.9	3.9	4.1	7.5	
Ni	0.0033	0.0034	0.0038	0.0040	0.0037	0.0037	0.0051	0.052
Pb	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0007	0.0032
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0039	0.0055
Se	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0008	0.005
SO ₄	10.2	10.2	10.3	10.4	10.4	10.5	15.3	250
Tl	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0003	0.00028
V	0.0014	0.0014	0.0014	0.0015	0.0015	0.0016	0.0027	
Zn	0.0175	0.0175	0.0175	0.0175	0.0175	0.0176	0.0180	0.106

Table 5-26. Deterministic Water Quality Predictions in Colby Lake (mg/L)

Colby Lake

Average Flow Conditions - Mine Site - Proposed Action

Parameter	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Standard (Reference Hardness = 100 mg/L)
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0730	0.0730	0.0730	0.0731	0.0730	0.0731	0.0717	0.125
As	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0044	0.01
B	0.0478	0.0478	0.0478	0.0479	0.0478	0.0479	0.0526	
Ba	0.0085	0.0085	0.0085	0.0085	0.0085	0.0085	0.0102	2
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.004
Ca	16.9	16.9	17.0	17.0	17.0	17.0	18.7	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0011
Cl	7.9	7.9	7.9	7.9	7.9	7.9	8.2	230
Co	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0007	0.0028
Cu	0.0019	0.0019	0.0019	0.0020	0.0019	0.0019	0.0020	0.0093
F	0.0826	0.0827	0.0826	0.0826	0.0825	0.0837	0.1286	2
Fe	1.6534	1.6528	1.6530	1.6532	1.6521	1.6535	1.6208	0.3
Hardness	107.5	107.5	107.5	107.6	107.6	107.8	112.4	500
K	1.3	1.3	1.3	1.3	1.3	1.3	1.7	
Mg	8.0	8.0	8.0	8.0	8.0	8.0	8.3	
Mn	0.1473	0.1473	0.1473	0.1473	0.1473	0.1474	0.1445	
Na	3.1	3.1	3.1	3.2	3.2	3.3	7.7	
Ni	0.0024	0.0024	0.0027	0.0028	0.0027	0.0027	0.0038	0.052
Pb	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.0032
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0037	0.0055
Se	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0007	0.005
SO ₄	9.6	9.6	9.6	9.6	9.6	9.7	13.1	250
Tl	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00028
V	0.0011	0.0011	0.0011	0.0012	0.0012	0.0012	0.0024	
Zn	0.0167	0.0167	0.0167	0.0167	0.0167	0.0168	0.0173	0.106

Table 5-27. Deterministic Water Quality Predictions in Colby Lake (mg/L)

Colby Lake

High Flow Conditions - Mine Site - Proposed Action

Parameter	Year 01	Year 05	Year 10	Year 15	Year 20	Closure	Post-Closure	Standard (Reference Hardness = 100 mg/L)
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0716	0.0717	0.0720	0.0722	0.0720	0.0720	0.0710	0.125
As	0.0021	0.0021	0.0022	0.0022	0.0022	0.0022	0.0051	0.01
B	0.0465	0.0465	0.0466	0.0466	0.0466	0.0466	0.0508	
Ba	0.0081	0.0081	0.0081	0.0081	0.0081	0.0081	0.0096	2
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.004
Ca	17.0	17.0	17.0	17.0	17.0	17.0	18.4	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0011
Cl	7.9	7.9	7.9	7.9	7.9	7.9	8.0	230
Co	0.0005	0.0005	0.0006	0.0007	0.0007	0.0007	0.0007	0.0028
Cu	0.0018	0.0018	0.0022	0.0025	0.0023	0.0023	0.0023	0.0093
F	0.0767	0.0768	0.0768	0.0768	0.0767	0.0771	0.0913	2
Fe	1.6284	1.6285	1.6288	1.6291	1.6286	1.6292	1.6056	0.3
Hardness	108.7	108.7	108.7	108.8	108.8	108.8	112.7	500
K	1.3	1.3	1.3	1.3	1.3	1.3	1.6	
Mg	8.0	8.0	8.0	8.0	8.0	8.0	8.2	
Mn	0.1486	0.1486	0.1487	0.1488	0.1487	0.1487	0.1468	
Na	2.8	2.8	2.9	2.9	2.9	2.9	5.2	
Ni	0.0020	0.0021	0.0033	0.0044	0.0041	0.0040	0.0047	0.052
Pb	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.0032
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0031	0.0055
Se	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.005
SO ₄	9.3	9.3	9.4	9.4	9.4	9.4	12.4	250
Tl	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00028
V	0.0010	0.0010	0.0010	0.0011	0.0011	0.0011	0.0022	
Zn	0.0164	0.0164	0.0165	0.0165	0.0165	0.0165	0.0169	0.106

Table 5-28. Multiplying factors for concentrations of leachate from Category 3 Waste Rock stockpile, Category 3 Lean Ore stockpile, Category 4 Waste Rock stockpile, and Lean Ore Surge Pile as well as for concentrations of seepage from East Pit and West Pit that would cause the Partridge River and Colby Lake water chemistry predictions to exceed the Minnesota surface water quality standards

Partridge River

Proposed Action

Parameter	Low Flow, Low Liner Yield					Average Flow, Average Liner Yield					High Flow, High Liner Yield				
	Standard (mg/L) ¹	Factor	Year	Location	Corresponding SO ₄ concentration (mg/L)	Standard (mg/L) ¹	Factor	Year	Location	Corresponding SO ₄ concentration (mg/L)	Standard (mg/L) ¹	Factor	Year	Location	Corresponding SO ₄ concentration (mg/L)
As	0.0530	18.6	Post-Closure	SW-004a	154.3	0.0530	11.8	Post-Closure	SW-004a	89.0	0.0530	21.9	Post-Closure	SW-004a	65.3
Co	0.0050	4.1	Year 15	SW-004	20.0	0.0050	14.4	Post-Closure	SW-004a	106.6	0.0050	35.3	Year 15	SW-004	10.4
Cu	0.0084	1.6	Year 15	SW-004	19.4	0.0100	9.2	Year 15	SW-003	10.7	0.0101	15.4	Year 15	SW-004	9.7
Ni	0.0469	2.3	Year 15	SW-004	19.6	0.0591	17.9	Post-Closure	SW-004a	130.3	0.0565	31.0	Year 15	SW-004	10.3
Sb	0.0310	8.1	Post-Closure	SW-004a	79.0	0.0310	6.1	Post-Closure	SW-004a	50.5	0.0310	24.0	Post-Closure	SW-004a	70.7

Reasonable Alternative 1

Parameter	Low Flow, Low Liner Yield					Average Flow, Average Liner Yield					High Flow, High Liner Yield				
	Standard (mg/L) ¹	Factor	Year	Location	Corresponding SO ₄ concentration (mg/L)	Standard (mg/L) ¹	Factor	Year	Location	Corresponding SO ₄ concentration (mg/L)	Standard (mg/L) ¹	Factor	Year	Location	Corresponding SO ₄ concentration (mg/L)
As	0.0530	22.0	Post-Closure	SW-004a	192.1	0.0530	13.5	Post-Closure	SW-004a	108.1	0.0530	24.2	Post-Closure	SW-004a	74.0
Co	0.0050	20.2	Post-Closure	SW-004a	178.0	0.0050	21.6	Post-Closure	SW-004a	167.4	0.0050	61.3	Post-Closure	SW-004a	173.8
Cu	0.0086	27.0	Post-Closure	SW-004a	231.1	0.0107	29.9	Post-Closure	SW-004a	228.2	0.0104	103.0	Post-Closure	SW-004a	286.0
Ni	0.0483	21.6	Post-Closure	SW-004a	188.9	0.0598	30.6	Post-Closure	SW-004a	233.3	0.0580	93.4	Post-Closure	SW-004a	260.2
Sb	0.0310	9.4	Post-Closure	SW-004a	93.8	0.0310	6.9	Post-Closure	SW-004a	59.8	0.0310	27.1	Post-Closure	SW-004a	81.8

Colby Lake

Proposed Action

Parameter	Low Flow, Low Liner Yield			
	Standard (mg/L) ¹	Factor	Year	Location
As	0.0100	5.4	Post-Closure	Colby Lake
Co	0.0028	14.6	Post-Closure	Colby Lake
Cu	0.0093	32.8	Post-Closure	Colby Lake
Ni	0.0520	32.0	Post-Closure	Colby Lake
Sb	0.0055	2.1	Post-Closure	Colby Lake
SO ₄	250	62.0	Post-Closure	Colby Lake

Average Flow, Average Liner Yield			
Standard (mg/L) ¹	Factor	Year	Location
0.0100	4.5	Post-Closure	Colby Lake
0.0028	17.6	Post-Closure	Colby Lake
0.0093	36.0	Post-Closure	Colby Lake
0.0520	38.0	Post-Closure	Colby Lake
0.0055	2.1	Post-Closure	Colby Lake
250	87.0	Post-Closure	Colby Lake

High Flow, High Liner Yield			
Standard (mg/L) ¹	Factor	Year	Location
0.0100	3.2	Post-Closure	Colby Lake
0.0028	11.3	Post-Closure	Colby Lake
0.0093	10.2	Year 15	Colby Lake
0.0520	19.0	Post-Closure	Colby Lake
0.0055	3.1	Post-Closure	Colby Lake
250	88.0	Post-Closure	Colby Lake

Reasonable Alternative 1

Parameter	Low Flow, Low Liner Yield			
	Standard (mg/L) ¹	Factor	Year	Location
As	0.0100	6.3	Post-Closure	Colby Lake
Co	0.0028	21.1	Post-Closure	Colby Lake
Cu	0.0093	59.7	Post-Closure	Colby Lake
Ni	0.0520	51.3	Post-Closure	Colby Lake
Sb	0.0055	2.3	Post-Closure	Colby Lake
SO ₄	250	60.2	Post-Closure	Colby Lake

Average Flow, Average Liner Yield			
Standard (mg/L) ¹	Factor	Year	Location
0.0100	5.1	Post-Closure	Colby Lake
0.0028	26.5	Post-Closure	Colby Lake
0.0093	59.8	Post-Closure	Colby Lake
0.0520	64.3	Post-Closure	Colby Lake
0.0055	2.3	Post-Closure	Colby Lake
250	80.2	Post-Closure	Colby Lake

High Flow, High Liner Yield			
Standard (mg/L) ¹	Factor	Year	Location
0.0100	3.6	Post-Closure	Colby Lake
0.0028	29.2	Post-Closure	Colby Lake
0.0093	83.8	Post-Closure	Colby Lake
0.0520	78.0	Post-Closure	Colby Lake
0.0055	3.5	Post-Closure	Colby Lake
250	84.0	Post-Closure	Colby Lake

¹ As and Co standards are hardness independent. Cu and Ni standards are hardness dependent and assume that the hardness and standards do not change from Tables 5-4 to 5-27 and Tables 7-1 to 7-24.

Table 5-29. Comparison of concentrations of leachate from Category 3 Waste Rock stockpile, Category 3 Lean Ore stockpile, Category 4 Waste Rock stockpile, and Lean Ore Surge Pile as well as for concentrations of seepage from East Pit and West Pit (all occurring concurrently) that would cause Partridge River water chemistry predictions to exceed the Minnesota surface water quality standards and the "Base Case" concentrations of these mine site features. "Base Case" concentrations are those presented in Section 4 Tables.

Partridge River Proposed Action																														
Flow/Yield Condition	As						Co						Cu						Ni						Sb					
	Low Flow, Low Liner Yield		Average Flow, Average Liner Yield		High Flow, High Liner Yield		Low Flow, Low Liner Yield		Average Flow, Average Liner Yield		High Flow, High Liner Yield		Low Flow, Low Liner Yield		Average Flow, Average Liner Yield		High Flow, High Liner Yield		Low Flow, Low Liner Yield		Average Flow, Average Liner Yield		High Flow, High Liner Yield		Low Flow, Low Liner Yield		Average Flow, Average Liner Yield		High Flow, High Liner Yield	
Year when Standard Exceeded	Post-Closure		Post-Closure		Post-Closure		Year 15		Post-Closure		Year 15		Year 15		Year 15		Year 15		Year 15		Post-Closure		Year 15		Post-Closure		Post-Closure		Post-Closure	
Feature	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)
Category 3 Waste Rock stockpile	0.7100	13.2060	0.7100	8.3780	0.7100	15.5490	44.0000	180.4000	44.0000	633.6000	36.0519	1,272.631	202.0000	327.2400	202.0000	1,858.400	202.0000	3,110.800	762.0	1,767.8	762.0	13,639.8	432.9	13,420.1	0.0800	0.6480	0.0800	0.4880	0.0800	1.9200
Category 3 Lean Ore stockpile	0.7100	13.2060	0.7100	8.3780	0.7100	15.5490	44.0000	180.4000	44.0000	633.6000	44.0000	1,553.200	202.0000	327.2400	202.0000	1,858.400	202.0000	3,110.800	762.0	1,767.8	762.0	13,639.8	661.3	20,500.5	0.0800	0.6480	0.0800	0.4880	0.0800	1.9200
Category 4 Waste Rock stockpile	0.7100	13.2060	0.7100	8.3780	0.7100	15.5490	44.0000	180.4000	29.0355	418.1108	19.4356	686.0770	9.1376	14.8029	5.2407	48.2149	3.5080	54.0236	618.7	1,435.3	762.0	13,639.8	237.5	7,362.8	0.0800	0.6480	0.0800	0.4880	0.0800	1.9200
Lean Ore Surge Pile	N/A	N/A	N/A	N/A	N/A																									

Partridge River Reasonable Alternative 1																															
Flow/Yield Condition	As						Co						Cu						Ni						Sb						
	Low Flow, Low Liner Yield		Average Flow, Average Liner Yield		High Flow, High Liner Yield		Low Flow, Low Liner Yield		Average Flow, Average Liner Yield		High Flow, High Liner Yield		Low Flow, Low Liner Yield		Average Flow, Average Liner Yield		High Flow, High Liner Yield		Low Flow, Low Liner Yield		Average Flow, Average Liner Yield		High Flow, High Liner Yield		Low Flow, Low Liner Yield		Average Flow, Average Liner Yield		High Flow, High Liner Yield		
Year when Standard Exceeded	Post-Closure		Post-Closure		Post-Closure		Post-Closure		Post-Closure		Post-Closure		Post-Closure		Post-Closure		Post-Closure		Post-Closure		Post-Closure		Post-Closure		Post-Closure		Post-Closure		Post-Closure		
Feature	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	"Base Case" Concentration (mg/L)	Concentration causing exceedance (mg/L)	
Category 2/3 Waste Rock stockpile	0.7070	15.5532	0.3258	4.3977	0.2260	5.4701	0.0520	1.0504	0.0493	1.0658	0.0342	2.0988	0.0920	2.4840	0.0920	2.7508	0.0920	9.4760	0.6973	15.0616	0.3213	9.8319	0.2229	20.8231	0.0800	0.7520	0.0800	0.5520	0.0800	2.1680	
Category 3 Lean Ore stockpile	0.7100	15.6200	0.4300	5.8049	0.2984	7.2204	0.0520	1.0504	0.0520	1.1232	0.0452	2.7703	0.0920	2.4840	0.0920	2.7508	0.0920	9.4760	0.8600	18.5760	0.4241	12.9779	0.2943	27.4860	0.0800	0.7520	0.0800	0.5520	0.0800	2.1680	
Category 4 Waste Rock stockpile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lean Ore Surge Pile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
East Pit	0.0177	0.3898	0.0																												

Table 5-30. Comparison of concentrations of leachate from Category 3 Waste Rock stockpile, Category 3 Lean Ore stockpile, Category 4 Waste Rock stockpile, and Lean Ore Surge Pile as well as for concentrations of seepage from East Pit and West Pit (all occurring concurrently) that would cause Colby Lake water chemistry predictions to exceed the Minnesota surface water quality standards and the "Base Case" concentrations of these mine site features. "Base Case" concentrations are those presented Section 4 Tables.

Colby Lake Proposed Action																																				
Flow/Yield Condition	As						Co						Cu						Ni						Sb						SO ₄					
	Low Flow, Low Liner Yield		Average Flow, Average Liner Yield		High Flow, High Liner Yield		Low Flow, Low Liner Yield		Average Flow, Average Liner Yield		High Flow, High Liner Yield		Low Flow, Low Liner Yield		Average Flow, Average Liner Yield		High Flow, High Liner Yield		Low Flow, Low Liner Yield		Average Flow, Average Liner Yield		High Flow, High Liner Yield		Low Flow, Low Liner Yield		Average Flow, Average Liner Yield		High Flow, High Liner Yield		Low Flow, Low Liner Yield					

Colby Lake Reasonable Alternative 1																																				
Flow/Yield Condition	As						Co						Cu						Ni						Sb						SO ₄					
	Low Flow, Low Liner Yield		Average Flow, Average Liner Yield		High Flow, High Liner Yield		Low Flow, Low Liner Yield		Average Flow, Average Liner Yield		High Flow, High Liner Yield		Low Flow, Low Liner Yield		Average Flow, Average Liner Yield		High Flow, High Liner Yield		Low Flow, Low Liner Yield		Average Flow, Average Liner Yield		High Flow, High Liner Yield		Low Flow, Low Liner Yield		Average Flow,									

Table 6-1. Hydraulic Conductivity Values Used in Previous Model (RS22)

	Kx=Ky	Kz
	(ft/day)	(ft/day)
Wetland Deposits	9.3	0.0000033
Glacial Drift	2.6	0.0000033
Duluth Complex	0.0024	0.0024
Virginia Formation – Upper Portion	0.34	0.34
Virginia Formation – Lower Portion	0.085	0.085
BIF	0.98	0.98
Giants Range batholith	0.029	0.029

Table 6-2. Cell Dimensions, Cross-Section Models

Δx	25 meters
Δy	10 meters
Δz , surficial deposits	1 meter
Δz , bedrock	20 meters

Table 6-3. Hydraulic Conductivity Values, Cross-Section Models

	Mine Site Models	Mine Site Models
$K_x = K_y = K_z$, surficial deposits	2.83 m/d	9.3 ft/day
$K_x = K_y = K_z$, bedrock	7.32×10^{-4} m/d	0.0024 ft/day

Table 6-4. Dispersion Coefficients, Cross-Section Models

Model	D_x (m)	D_z (m)
Category 1/2 - Overburden Stockpile	17.3	0.865
West Pit	13.2	0.66
East Pit and Category 4 Waste Rock Stockpile	14.3	0.715
Category 3 Waste Rock Stockpile	12.5	0.625
Category 3 Lean Ore Stockpile	12.2	0.61
Lean Ore Surge Pile	13.4	0.67

Table 6-5. Background and Recharge Concentration Sources, Used in the Mine Site-Proposed Action Cross-Section Models

Model	Recharge concentration source data (surficial deposits)¹	Background concentration source data (surficial deposits)¹	Background concentration source data (bedrock)
Category 1/2 – Overburden Stockpile	Average values from well MW-05-8	Average values from well MW-05-8	N/A
West Pit	Average values from well MW-05-8	West Pit water quality predictions	Average values from mine site bedrock wells
East Pit and Category 4 Waste Rock Stockpile	Average values from well MW-05-2	East Pit water quality predictions	Average values from mine site bedrock wells
Category 3 Waste Rock Stockpile	Average values from well MW-05-2	East Pit water quality predictions	N/A
Category 3 Lean Ore Stockpile	Average values from well MW-05-2	Average values from well MW-05-2	N/A
Lean Ore Surge Pile	Average values from well MW-05-2	Average values from well MW-05-2	N/A

¹ Recharge and background concentrations were set using water quality data from the well nearest the cross-section

Table 6-6. Predicted Groundwater Concentrations - Screening Level Model - Proposed Action, Category 1/2 Stockpile with Overburden - Low Liner Leakage Concentrations

Source Proportional Contribution

	Surficial Deposits	
	Property Boundary	Partridge River
Category 1/2	0.2156	0.1703
Recharge	0.1616	0.3379
Overburden	0.6228	0.4918

Parameter	Units	GW Standard	EPA sMCL	Cat 1/2 Predicted Concentrations Post-Closure	Recharge/background concentration	Overburden concentration	Surficial Deposits	
							Predicted concentration, property boundary	Predicted concentration, Partridge River
Ag	mg/L	0.030	0.10	0.0007	0.00066	0	0.0003	0.0003
Al	mg/L	--	0.05	1.6800	1.653	0.14	0.7165	0.9135
As	mg/L	0.010	--	0.7100	0.00283	0.0027	0.1552	0.1232
B	mg/L	0.600	--	0.7600	0.02683	0.037	0.1912	0.1567
Ba	mg/L	2	--	0.1900	0.03087	0.014	0.0547	0.0497
Be	mg/L	8.0E-05	--	0.0002	0.00010	0	0.0001	0.0001
Ca	mg/L	--	--	540.0000	13.83	15.8	128.4992	104.4056
Cd	mg/L	0.004	--	0.0002	0.00010	0	0.0001	0.0001
Cl	mg/L	--	250.00	0.0000	1.19	2.33	1.6434	1.5480
Co	mg/L	--	--	0.0520	0.0013	0.0013	0.0122	0.0099
Cu	mg/L	1.3	1.00	0.0920	0.00783	0.017	0.0317	0.0267
F	mg/L	4	2.00	0.0621	0.16	0.42	0.3008	0.2712
Fe	mg/L	--	0.30	0.8100	1.85	0.15	0.5670	0.8368
Hardness	mg/L	--	--	1729.3495	62.40	71.5	427.4618	350.7569
K	mg/L	--	--	49.0000	1.57	4.45	13.5896	11.0637
Mg	mg/L	--	--	93.0000	6.76	9.01	26.7546	22.5532
Mn	mg/L	--	0.05	0.7500	0.197	0.116	0.2658	0.2513
Na	mg/L	--	--	681.0000	12.17	7.19	153.2682	123.6226
Ni	mg/L	0.100	--	0.3824	0.00570	0.019	0.0952	0.0764
Pb	mg/L	0.015	--	0.0457	0.00050	0	0.0099	0.0079
Sb	mg/L	0.006	--	0.0800	0.0015	0.0004	0.0177	0.0143
Se	mg/L	0.030	--	0.0029	0.001	0.002	0.0020	0.0018
SO ₄	mg/L	250	250.00	2128.7143	17.57	68.30	504.3274	402.0469
Tl	mg/L	6E-04	--	0.0000	0.001	0.00000	0.0002	0.0003
V	mg/L	0.050	--	0.1900	0.00	0.0014	0.0418	0.0330
Zn	mg/L	2	5.00	0.0900	0.0075	0.003	0.0225	0.0193

Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge/background concentrations are average groundwater quality data from MW-05-8 with non-detects set at 1/2 the detection limit

Table 6-7. Predicted Groundwater Concentrations - Screening Level Model - Proposed Action, Category 1/2 Stockpile with Overburden - Average Liner Leakage Concentrations

Source Proportional Contribution

	Surficial Deposits	
	Property Boundary	Partridge River
Category 1/2	0.2156	0.1703
Recharge	0.1616	0.3379
Overburden	0.6228	0.4918

Parameter	Units	GW Standard	EPA SMCL	Cat 1/2 Predicted Concentrations Post-Closure	Recharge/background concentration	Overburden concentration	Surficial Deposits	
							Predicted concentration, property boundary	Predicted concentration, Partridge River
Ag	mg/L	0.030	0.10	0.0007	0.00066	0	0.0003	0.0003
Al	mg/L	--	0.05	1.6800	1.653	0.14	0.7165	0.9135
As	mg/L	0.010	--	0.7100	0.00283	0.0027	0.1552	0.1232
B	mg/L	0.600	--	0.7600	0.02683	0.037	0.1912	0.1567
Ba	mg/L	2	--	0.1900	0.03087	0.014	0.0547	0.0497
Be	mg/L	8.0E-05	--	0.0002	0.00010	0	0.00006	0.00007
Ca	mg/L	--	--	435.9790	13.83	15.8	106.0722	86.6908
Cd	mg/L	0.004	--	0.0002	0.00010	0	0.0001	0.0001
Cl	mg/L	--	250.00	0.0000	1.19	2.33	1.6434	1.5480
Co	mg/L	--	--	0.0272	0.0013	0.0013	0.0069	0.0057
Cu	mg/L	1.3	1.00	0.0920	0.00783	0.017	0.0317	0.0267
F	mg/L	4	2.00	0.0623	0.16	0.42	0.3009	0.2712
Fe	mg/L	--	0.30	0.8100	1.85	0.15	0.5670	0.8368
Hardness	mg/L	--	--	1412.9373	62.40	71.5	359.2433	296.8719
K	mg/L	--	--	49.0000	1.57	4.45	13.5896	11.0637
Mg	mg/L	--	--	79.1470	6.76	9.01	23.7679	20.1941
Mn	mg/L	--	0.05	0.5937	0.197	0.116	0.2321	0.2247
Na	mg/L	--	--	443.6984	12.17	7.19	102.1060	83.2101
Ni	mg/L	0.100	--	0.1762	0.00570	0.019	0.0507	0.0413
Pb	mg/L	0.015	--	0.0210	0.00050	0	0.0046	0.0038
Sb	mg/L	0.006	--	0.0800	0.0015	0.0004	0.0177	0.0143
Se	mg/L	0.030	--	0.0029	0.001	0.002	0.0020	0.0018
SO ₄	mg/L	250	250.00	980.8782	17.57	68.30	256.8539	206.5704
Tl	mg/L	6E-04	--	0.0000	0.001	0.00000	0.0002	0.0003
V	mg/L	0.050	--	0.1900	0.00	0.0014	0.0418	0.0330
Zn	mg/L	2	5.00	0.0900	0.0075	0.003	0.0225	0.0193

Groundwater standard exceedance

EPA SMCL exceedance

-- No applicable standard

Recharge/background concentrations are average groundwater quality data from MW-05-8 with non-detects set at 1/2 the detection limit

Table 6-8. Predicted Groundwater Concentrations - Screening Level Model - Proposed Action, Category 1/2 Stockpile with Overburden - High Liner Leakage Concentrations

Source Proportional Contribution

	Surficial Deposits	
	Property Boundary	Partridge River
Category 1/2	0.2156	0.1703
Recharge	0.1616	0.3379
Overburden	0.6228	0.4918

Parameter	Units	GW Standard	EPA sMCL	Cat 1/2 Predicted Concentrations Post-Closure	Recharge/background concentration	Overburden concentration	Surficial Deposits	
							Predicted concentration, property boundary	Predicted concentration, Partridge River
Ag	mg/L	0.030	0.10	0.0007	0.00066	0	0.0003	0.0003
Al	mg/L	--	0.05	1.6800	1.653	0.14	0.7165	0.9135
As	mg/L	0.010	--	0.7100	0.00283	0.0027	0.1552	0.1232
B	mg/L	0.600	--	0.7600	0.02683	0.037	0.1912	0.1567
Ba	mg/L	2	--	0.1900	0.03087	0.014	0.0547	0.0497
Be	mg/L	8.0E-05	--	0.0002	0.00010	0	0.00006	0.00007
Ca	mg/L	--	--	302.5160	13.83	15.8	77.2976	63.9621
Cd	mg/L	0.004	--	0.0002	0.00010	0	0.0001	0.0001
Cl	mg/L	--	250.00	0.0000	1.19	2.33	1.6434	1.5480
Co	mg/L	--	--	0.0189	0.0013	0.0013	0.0051	0.0043
Cu	mg/L	1.3	1.00	0.0920	0.00783	0.017	0.0317	0.0267
F	mg/L	4	2.00	0.0625	0.16	0.42	0.3009	0.2713
Fe	mg/L	--	0.30	0.8100	1.85	0.15	0.5670	0.8368
Hardness	mg/L	--	--	980.4055	62.40	71.5	265.9895	223.2117
K	mg/L	--	--	49.0000	1.57	4.45	13.5896	11.0637
Mg	mg/L	--	--	54.9183	6.76	9.01	18.5442	16.0679
Mn	mg/L	--	0.05	0.4120	0.197	0.116	0.1929	0.1938
Na	mg/L	--	--	307.8723	12.17	7.19	72.8219	60.0789
Ni	mg/L	0.100	--	0.1223	0.00570	0.019	0.0391	0.0321
Pb	mg/L	0.015	--	0.0146	0.00050	0	0.0032	0.0027
Sb	mg/L	0.006	--	0.0800	0.0015	0.0004	0.0177	0.0143
Se	mg/L	0.030	--	0.0029	0.001	0.002	0.0020	0.0018
SO ₄	mg/L	250	250.00	680.6093	17.57	68.30	192.1159	155.4346
Tl	mg/L	6E-04	--	0.0000	0.001	0.00000	0.0002	0.0003
V	mg/L	0.050	--	0.1900	0.00	0.0014	0.0418	0.0330
Zn	mg/L	2	5.00	0.0900	0.0075	0.003	0.0225	0.0193

Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge/background concentrations are average groundwater quality data from MW-05-8 with non-detects set at 1/2 the detection limit

Table 6-9. Predicted Groundwater Concentrations - Screening Level Model - Proposed Action, West Pit Flow Path - Low Liner Leakage Rates

Source Proportional Contribution									
	Surficial Deposits				Bedrock				
	Property Boundary	Partridge River	Property Boundary	Partridge River	Property Boundary	Partridge River	Property Boundary	Partridge River	Property Boundary
West Pit	0.4224	0.4048	0.4214	0.3099					
Recharge	0.5776	0.5952	0.5786	0.6901					

Parameter	Units	GW Standard	EPA sMCL	West Pit Predicted Concentrations Post-Closure (Year 77)	Recharge/ background concentration, surficial deposits	Surficial deposits		Bedrock	
						Predicted concentration, property boundary	Predicted concentration, Partridge River	Predicted concentration, property boundary	Predicted concentration, Partridge River
SO ₄	mg/l	--	250.00	246.99	17.57	114.48	110.44	114.25	88.67
Ag	mg/l	0.030	0.100	0.0010	6.60E-04	0.00080	0.00080	0.00080	0.00077
Al	mg/l	--	0.05	0.019	1.653	0.96	0.99	0.96	1.15
As	mg/l	0.01		0.097	0.0028	0.043	0.041	0.043	0.032
B	mg/l	0.60		0.26	0.0268	0.12	0.12	0.12	0.10
Ba	mg/l	2		0.095	0.0309	0.06	0.06	0.06	0.05
Be	mg/l	8.00E-05		0.00080	1.00E-04	0.00039	0.00038	0.00039	0.00032
Ca	mg/l	--		94.24	13.83	47.80	46.38	47.71	38.75
Cd	mg/l	0.004		0.00012	1.00E-04	0.00011	0.00011	0.00011	0.00011
Cl	mg/l	--	250.00	13.47	1.19	6.38	6.16	6.36	5.00
Co	mg/l	--		0.0080	0.0013	0.0041	0.0040	0.0041	0.0034
Cu	mg/l	1.30	1.00	0.006	0.00783	0.0071	0.0071	0.0071	0.0073
F	mg/l	4.00	2.00	1.32	0.16	0.65	0.63	0.65	0.52
Fe	mg/l	--	0.30	0.10	1.85	1.11	1.14	1.11	1.31
Hardness	mg/l	--		313.28	62.40	168.38	163.96	168.12	140.15
K	mg/L	--		15.64	1.57	7.51	7.26	7.50	5.93
Mg	mg/l	--		19.02	6.76	11.94	11.72	11.93	10.56
Mn	mg/l	--	0.05	0.01	0.197	0.12	0.12	0.12	0.14
Na	mg/l	--		169.78	12.17	78.75	75.97	78.59	61.01
Ni	mg/l	0.10		0.072	0.0057	0.034	0.032	0.033	0.026
Pb	mg/l	0.015		0.0065	5.00E-04	0.0030	0.0029	0.0030	0.0024
Sb	mg/l	0.006		0.1201	1.50E-03	0.0516	0.0495	0.0515	0.0383
Se	mg/l	0.030		0.0057	0.001	0.0030	0.0029	0.0030	0.0024
Tl	mg/l	0.0006		0.00026	0.001	0.00069	0.00070	0.00069	0.00077
V	mg/l	0.050		0.0571	0.000	0.0241	0.0231	0.0241	0.0177
Zn	mg/l	2.00	5.00	0.038	0.0075	0.020	0.020	0.020	0.017

Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge/background concentrations are average groundwater quality data from MW-05-8 with non-detects set at 1/2 the detection limit

Table 6-10. Predicted Groundwater Concentrations - Screening Level Model - Proposed Action, West Pit Flow Path - Average Liner Leakage Rates

Source Proportional Contribution									
						Surficial Deposits		Bedrock	
						Property Boundary	Partridge River	Property Boundary	Partridge River
West Pit						0.4224	0.4048	0.4214	0.3099
Recharge						0.5776	0.5952	0.5786	0.6901

						Surficial deposits		Bedrock	
Parameter	Units	GW Standard	EPA sMCL	West Pit Predicted Concentrations Post-Closure (Year 67)	Recharge/ background concentration, surficial deposits	Predicted concentration, property boundary	Predicted concentration, Partridge River	Predicted concentration, property boundary	Predicted concentration, Partridge River
SO ₄	mg/l	--	250.00	173.26	17.57	83.34	80.60	83.18	65.82
Ag	mg/l	0.030	0.100	0.0009	6.60E-04	0.00077	0.00077	0.00077	0.00074
Al	mg/l	--	0.05	0.019	1.653	0.96	0.99	0.96	1.15
As	mg/l	0.01		0.105	0.0028	0.046	0.044	0.046	0.035
B	mg/l	0.60		0.28	0.0268	0.13	0.13	0.13	0.10
Ba	mg/l	2		0.093	0.0309	0.06	0.06	0.06	0.05
Be	mg/l	8.00E-05		0.00070	1.00E-04	0.00035	0.00034	0.00035	0.00028
Ca	mg/l	--		98.81	13.83	49.73	48.23	49.64	40.16
Cd	mg/l	0.004		0.00015	1.00E-04	0.00012	0.00012	0.00012	0.00012
Cl	mg/l	--	250.00	21.40	1.19	9.73	9.37	9.71	7.45
Co	mg/l	--		0.0060	0.0013	0.0033	0.0032	0.0033	0.0027
Cu	mg/l	1.30	1.00	0.006	0.00783	0.0071	0.0071	0.0071	0.0073
F	mg/l	4.00	2.00	2.25	0.16	1.04	1.01	1.04	0.81
Fe	mg/l	--	0.30	0.10	1.85	1.11	1.14	1.11	1.31
Hardness	mg/l	--		330.74	62.40	175.76	171.03	175.48	145.56
K	mg/L	--		17.20	1.57	8.17	7.90	8.16	6.41
Mg	mg/l	--		20.50	6.76	12.56	12.32	12.55	11.02
Mn	mg/l	--	0.05	0.01	0.197	0.12	0.12	0.12	0.14
Na	mg/l	--		220.03	12.17	99.98	96.31	99.76	76.59
Ni	mg/l	0.10		0.054	0.0057	0.026	0.025	0.026	0.021
Pb	mg/l	0.015		0.0052	5.00E-04	0.0025	0.0024	0.0025	0.0020
Sb	mg/l	0.006		0.1064	1.50E-03	0.0458	0.0440	0.0457	0.0340</

Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge/background concentrations are average groundwater quality data from MW-05-8 with non-detects set at 1/2 the detection limit

Table 6-11. Predicted Groundwater Concentrations - Screening Level Model - Proposed Action, West Pit Flow Path - High Liner Leakage Rates

Source Proportional Contribution				
	Surficial Deposits		Bedrock	
	Property Boundary	Partridge River	Property Boundary	Partridge River
West Pit	0.4224	0.4048	0.4214	0.3099
Recharge	0.5776	0.5952	0.5786	0.6901

Parameter	Units	GW Standard	EPA sMCL	West Pit Predicted Concentrations Post-Closure (Year 61)	Recharge concentration	Surficial deposits		Bedrock	
						Predicted concentration, property boundary	Predicted concentration, Partridge River	Predicted concentration, property boundary	Predicted concentration, Partridge River
SO ₄	mg/l	--	250.00	211.84	17.57	99.64	96.21	99.44	77.77
Ag	mg/l	0.030	0.100	0.0009	6.60E-04	0.00076	0.00076	0.00076	0.00074
Al	mg/l	--	0.05	0.019	1.653	0.96	0.99	0.96	1.15
As	mg/l	0.01		0.198	0.0028	0.085	0.082	0.085	0.063
B	mg/l	0.60		0.33	0.0268	0.16	0.15	0.15	0.12
Ba	mg/l	2		0.108	0.0309	0.06	0.06	0.06	0.05
Be	mg/l	8.00E-05		0.00064	1.00E-04	0.00033	0.00032	0.00033	0.00027
Ca	mg/l	--		109.87	13.83	54.40	52.71	54.30	43.59
Cd	mg/l	0.004		0.00014	1.00E-04	0.00012	0.00012	0.00012	0.00011
Cl	mg/l	--	250.00	11.54	1.19	5.56	5.38	5.55	4.40
Co	mg/l	--		0.0075	0.0013	0.0039	0.0038	0.0039	0.0032
Cu	mg/l	1.30	1.00	0.006	0.00783	0.0071	0.0071	0.0071	0.0073
F	mg/l	4.00	2.00	1.06	0.16	0.54	0.52	0.54	0.44
Fe	mg/l	--	0.30	0.10	1.85	1.11	1.14	1.11	1.31
Hardness	mg/l	--		364.08	62.40	189.84	184.52	189.53	155.89
K	mg/L	--		20.67	1.57	9.64	9.30	9.62	7.49
Mg	mg/l	--		21.90	6.76	13.15	12.89	13.14	11.45
Mn	mg/l	--	0.05	0.01	0.197	0.12	0.12	0.12	0.14
Na	mg/l	--		162.16	12.17	75.53	72.89	75.37	58.65
Ni	mg/l	0.10		0.064	0.0057	0.030	0.029	0.030	0.024
Pb	mg/l	0.015		0.0055	5.00E-04	0.0026	0.0025	0.0026	0.0020
Sb	mg/l	0.006		0.1059	1.50E-03	0.0456	0.0438	0.0455	0.0339
Se	mg/l	0.030		0.0052	0.001	0.0028	0.0027	0.0028	0.0023
V	mg/l	0.050		0.0778	0.000	0.0329	0.0315	0.0328	0.0241
Tl	mg/l	0.0006		0.00024	0.001	0.00068	0.00069	0.00068	0.00076
Zn	mg/l	2.00	5.00	0.049	0.0075	0.025	0.024	0.025	0.020

Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge concentrations are average groundwater quality data from MW-05-8 with non-detects set at 1/2 the detection limit

**Table 6-12. Predicted Groundwater Concentrations - Screening Level Model - Proposed Action
East Pit & Category 4 Stockpile Flow Path - Low Liner Leakage**

Source Area Proportional Contributions

	Surficial Deposits	Bedrock
	Partridge River/ Property Boundary	Partridge River/ Property Boundary
Category 4 Stockpile	8.09E-05	8.09E-05
East Pit (Surficial)	0.1707	0.1717
East Pit (Bedrock)	2.03E-04	2.04E-04
Recharge	0.8287	0.8278

Parameter	Units	GW Standard	EPA sMCL	Cat 4 Predicted Concentrations Post-Closure	East Pit Pore Water Predicted Concentrations (Bedrock Background)	Total East Pit Water Predicted Concentrations (Surficial Background)	Recharge concentration	Surficial Deposits	Bedrock
								Predicted concentration, Partridge River/property boundary	Predicted concentration, Partridge River/property boundary
Ag	mg/L	0.030	0.10	0.0007	0.0002	0.0003	0.00075	0.001	0.001
Al	mg/L	--	0.05	83.0000	1.20	0.72	0.1768	0.277	0.277
As	mg/L	0.010	--	0.7100	0.029	0.024	0.00210	0.0059	0.0059
B	mg/L	0.600	--	0.7600	0.10	0.21	0.02125	0.0542	0.0544
Ba	mg/L	2	--	0.1900	0.03	0.04	0.00500	0.0104	0.0104
Be	mg/L	8.0E-05	--	0.0023	0.00018	0.00015	0.00010	1.08E-04	1.08E-04
Ca	mg/L	--	--	480.00	47.54	89.18	24.35	35.5	35.5
Cd	mg/L	0.004	--	0.0149	4.35E-05	1.08E-04	0.00010	0.0001	0.0001
Cl	mg/L	--	250.00	43.5190	7.97	50.80	1.21	9.7	9.7
Co	mg/L	--	--	44.0000	0.0029	0.0018	0.00050	0.004	0.004
Cu	mg/L	1.3	1.00	202.00	0.108	0.0651	0.00680	0.033	0.033
F	mg/L	4	2.00	0.0629	0.33	6.40	0.13	1.200	1.206
Fe	mg/L	--	0.30	235.0000	1.36	0.81	0.202	0.325	0.326
Hardness	mg/L	--	--	5,435.69	167.1	303.9	77.3	116.4	116.6
K	mg/L	--	--	38.0000	6.83	14.94	1.365	3.7	3.7
Mg	mg/L	--	--	1,030.00	11.80	19.74	3.98	6.8	6.8
Mn	mg/L	--	0.05	47.0000	0.30	0.18	0.039	0.066	0.066
Na	mg/L	--	--	338.00	41.37	428.66	8.64	80.4	80.8
Ni	mg/L	0.100	--	762.00	0.025	0.015	0.001	0.065	0.065
Pb	mg/L	0.015	--	0.0528	0.0025	0.0062	0.00050	0.001	0.001
Sb	mg/L	0.006	--	0.0800	0.040	0.028	0.0015	0.0061	0.0061
Se	mg/L	0.030	--	0.0029	0.0010	0.013	0.0001	0.0024	0.0024
SO ₄	mg/L	--	250.00	34.88	95.78	178.78	13.6	41.8	42.0
Tl	mg/L	6E-04	--	0.0001	0.00044	0.00027	0.001	0.001	0.001
V	mg/L	0.050	--	0.19	0.016	0.030		0.0051	0.0051
Zn	mg/L	2	5.00	26.0000	0.030	0.028	0.00875	0.014	0.014

Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Table 6-13. Predicted Groundwater Concentrations - Screening Level Model - Proposed Action, East Pit & Category 4 Stockpile Flow Path - Average Liner Leakage

Source Area Proportional Contributions

	Surficial Deposits	Bedrock
	Partridge River/ Property Boundary	Partridge River/ Property Boundary
Category 4 Stockpile	1.30E-04	1.30E-04
East Pit (Surficial)	0.1707	0.1716
East Pit (Bedrock)	2.02E-04	2.03E-04
Recharge	0.8287	0.8280

Parameter	Units	GW Standard	EPA sMCL	Cat 4 Predicted Concentrations Post-Closure	East Pit Pore Water Predicted Concentrations (Bedrock Background)	Total East Pit Water Predicted Concentrations (Surficial Background)	Recharge concentration	Surficial Deposits	Bedrock
								Predicted concentration, Partridge River/property boundary	Predicted concentration, Partridge River/property boundary
Ag	mg/L	0.030	0.10	0.0007	0.0002	0.0002	0.00075	0.001	0.001
Al	mg/L	--	0.05	83.0000	0.80	0.54	0.1768	0.249	0.249
As	mg/L	0.010	--	0.7100	0.027	0.023	0.00210	0.0058	0.0058
B	mg/L	0.600	--	0.7600	0.08	0.18	0.02125	0.0487	0.0489
Ba	mg/L	2	--	0.1900	0.02	0.031	0.00500	0.0094	0.0094
Be	mg/L	8.0E-05	--	0.0023	0.00013	0.00012	0.00010	1.04E-04	1.04E-04
Ca	mg/L	--	--	480.00	33.41	72.95	24.35	32.7	32.8
Cd	mg/L	0.004	--	0.0149	2.73E-05	8.68E-05	0.00010	0.0001	0.0001
Cl	mg/L	--	250.00	14.5063	6.21	42.55	1.21	8.3	8.3
Co	mg/L	--	--	44.0000	0.0015	0.0010	0.00050	0.006	0.006
Cu	mg/L	1.3	1.00	151.63	0.076	0.051	0.00680	0.034	0.034
F	mg/L	4	2.00	0.0630	0.20	5.31	0.13	1.014	1.019
Fe	mg/L	--	0.30	235.0000	1.23	0.81	0.202	0.336	0.337
Hardness	mg/L	--	--	5,435.69	120.38	250.36	77.3	107.5	107.7
K	mg/L	--	--	38.0000	4.74	12.22	1.365	3.2	3.2
Mg	mg/L	--	--	1,030.00	9.01	16.59	3.98	6.3	6.3
Mn	mg/L	--	0.05	47.0000	0.22	0.15	0.039	0.063	0.063
Na	mg/L	--	--	338.00	25.13	353.9	8.64	67.6	67.9
Ni	mg/L	0.100	--	762.00	0.013	0.0086	0.001	0.101	0.102
Pb	mg/L	0.015	--	0.0528	0.0015	0.0049	0.00050	0.001	0.001
Sb	mg/L	0.006	--	0.0800	0.026	0.021	0.0015	0.0049	0.0049
Se	mg/L	0.030	--	0.0029	0.0008	0.011	0.0001	0.0020	0.0020
SO ₄	mg/L	--	250.00	9,600.00	46.40	132.42	13.6	35.1	35.2
Tl	mg/L	6E-04	--	0.0001	0.00033	0.00022	0.001	0.001	0.001
V	mg/L	0.050	--	0.19	0.013	0.025		0.0044	0.0044
Zn	mg/L	2	5.00	26.0000	0.021	0.023	0.00875	0.015	0.015

Groundwater standard exceedance

EPA sMCL exceedance

No applicable standard

Table 6-14. Predicted Groundwater Concentrations - Screening Level Model - Proposed Action, East Pit & Category 4 Stockpile Flow Path - High Liner Leakage

Source Area Proportional Contributions

	Surficial Deposits	Bedrock
	Partridge River/ Property Boundary	Partridge River/ Property Boundary
Category 4 Stockpile	3.68E-03	3.68E-03
East Pit (Surficial)	0.1681	0.1689
East Pit (Bedrock)	1.97E-04	1.98E-04
Recharge	0.8277	0.8269

Parameter	Units	GW Standard	EPA sMCL	Cat 4 Predicted Concentrations Post-Closure	East Pit Pore Water Predicted Concentrations (Bedrock Background)	Total East Pit Water Predicted Concentrations (Surficial Background)	Recharge concentration	Surficial Deposits	Bedrock
								Predicted concentration, Partridge River/property boundary	Predicted concentration, Partridge River/property boundary
Ag	mg/L	0.030	0.10	0.0007	0.0002	0.0002	0.00075	0.001	0.001
Al	mg/L	--	0.05	83.0000	0.75	0.65	0.1768	0.561	0.579
As	mg/L	0.010	--	0.7100	0.023	0.022	0.00210	0.0080	0.0082
B	mg/L	0.600	--	0.7600	0.08	0.12	0.02125	0.0406	0.0335
Ba	mg/L	2	--	0.1900	0.03	0.03	0.00500	0.0098	0.0095
Be	mg/L	8.0E-05	--	0.0023	0.00012	0.00012	0.00010	1.11E-04	1.11E-04
Ca	mg/L	--	--	480.00	33.87	50.25	24.35	30.4	27.6
Cd	mg/L	0.004	--	0.0149	3.16E-05	5.57E-05	0.00010	0.0001	0.0001
Cl	mg/L	--	250.00	6.5052	6.30	21.40	1.21	4.6	2.1
Co	mg/L	--	--	44.0000	0.0020	0.0017	0.00050	0.163	0.163
Cu	mg/L	1.3	1.00	30.33	0.072	0.062	0.00680	0.128	0.129
F	mg/L	4	2.00	0.0630	0.25	2.37	0.13	0.506	0.150
Fe	mg/L	--	0.30	235.0000	0.94	0.81	0.202	1.168	1.191
Hardness	mg/L	--	--	5,435.69	120.04	174.15	77.3	113.3	104.2
K	mg/L	--	--	38.0000	4.81	7.91	1.365	2.6	2.1
Mg	mg/L	--	--	1,030.00	8.65	11.85	3.98	9.1	8.5
Mn	mg/L	--	0.05	47.0000	0.22	0.185	0.039	0.236	0.241
Na	mg/L	--	--	338.00	27.04	163.49	8.64	35.9	13.0
Ni	mg/L	0.100	--	762.00	0.017	0.015	0.001	2.807	2.806
Pb	mg/L	0.015	--	0.0528	0.0019	0.0033	0.00050	0.001	0.001
Sb	mg/L	0.006	--	0.0800	0.026	0.024	0.0015	0.0056	0.0059
Se	mg/L	0.030	--	0.0029	0.0009	0.0052	0.0001	0.0010	0.0002
SO ₄	mg/L	--	250.00	9,600.00	63.04	96.47	13.6	62.8	57.2
TI	mg/L	6E-04	--	0.0001	0.00035	0.00030	0.001	0.001	0.001
V	mg/L	0.050	--	0.19	0.014	0.019		0.0039	0.0031
Zn	mg/L	2	5.00	26.0000	0.023	0.024	0.00875	0.107	0.107

Groundwater standard exceedance

EPA sMCL exceedance

Table 6-15. Predicted Groundwater Concentrations - Screening Level Model - Proposed Action, Category 3 Stockpile Flow Path - Low Liner Leakage

Source Proportional Contribution

	Surficial Deposits
	Partridge River
Category 3	3.313E-03
Recharge	0.3884
Up-Gradient (East Pit)	0.6083

Parameter	Units	GW Standard	EPA sMCL	Cat 3 Predicted Concentrations Post-Closure	East Pit Predicted Concentrations During West Pit Flooding (Background)	Recharge Concentration	Surficial Deposits
							Predicted concentration, Partridge River
Ag	mg/L	0.030	0.10	0.0007	0.00	0.00075	0.001
Al	mg/L	--	0.05	83.0000	1.58	0.1768	1.304
As	mg/L	0.010		0.7100	0.08	0.00210	0.049
B	mg/L	0.600		0.7600	0.21	0.02125	0.137
Ba	mg/L	2		0.1900	0.14	0.00500	0.085
Be	mg/L	8.0E-05		0.0023	0.00	0.00010	0.000
Ca	mg/L	--		540.00	104.39	24.35	74.741
Cd	mg/L	0.004		0.0149	0.00	0.00010	0.000
Cl	mg/L	--	250.00	35.0562	6.53	1.21	4.557
Co	mg/L	--		44.0000	0.01	0.00050	0.151
Cu	mg/L	1.3	1.00	202.00	0.09	0.00680	0.727
F	mg/L	4	2.00	0.0623	1.39	0.13	0.896
Fe	mg/L	--	0.30	235.0000	0.81	0.202	1.350
Hardness	mg/L	--		5,435.69		77.3	48.033
K	mg/L	--		49.0000	17.02	1.365	11.043
Mg	mg/L	--		1,030.00	11.53	3.98	11.971
Mn	mg/L	--	0.05	47.0000	0.32	0.039	0.365
Na	mg/L	--		681.00	86.84	8.64	58.430
Ni	mg/L	0.100		762.00	0.08	0.001	2.576
Pb	mg/L	0.015		0.0528	0.01	0.00050	0.004
Sb	mg/L	0.006		0.0800	0.08	0.0015	0.047
Se	mg/L	0.030		0.0029	0.00	0.0001	0.003
SO ₄	mg/L	--	250.00	9,600.00	201.24	13.6	159.489
TI	mg/L	6E-04		0.0001	0.00	0.001	0.001
V	mg/L	0.050		0.19		0.00	0.001
Zn	mg/L	2	5.00	26.0000	0.09	0.00875	0.144

	Groundwater standard exceedance
	EPA sMCL exceedance
--	No applicable standard

Recharge concentrations are average groundwater quality data from MW-05-2 with non-detects set at 1/2 the detection limit

Background concentrations are predicted East Pit concentrations during West Pit Filling

**Table 6-16. Predicted Groundwater Concentrations - Screening Level Model - Proposed Action
Category 3 Stockpile Flow Path - Average Liner Leakage**

Source Proportional Contribution

	Surficial Deposits Partridge River
Category 3	5.453E-03
Recharge	0.3881
Up-Gradient (East Pit)	0.6064

Parameter	Units	GW Standard	EPA sMCL	Cat 3 Predicted Concentrations Post-Closure	East Pit Predicted Concentrations During West Pit Flooding (Background)	Recharge concentration	Surficial Deposits
							Predicted concentration, Partridge River
Ag	mg/L	0.030	0.10	0.0007	0.0011	0.00075	0.001
Al	mg/L	--	0.05	83.0000	1.5593	0.1768	1.467
As	mg/L	0.010		0.7100	0.0780	0.00210	0.052
B	mg/L	0.600		0.7600	0.2097	0.02125	0.140
Ba	mg/L	2		0.1900	0.1335	0.00500	0.084
Be	mg/L	8.0E-05		0.0023	0.0002	0.00010	0.000
Ca	mg/L	--		540.00	103.0704	24.35	74.902
Cd	mg/L	0.004		0.0149	0.0002	0.00010	0.000
Cl	mg/L	--	250.00	16.1010	6.3932	1.21	4.435
Co	mg/L	--		44.0000	0.0082	0.00050	0.245
Cu	mg/L	1.3	1.00	202.00	0.0911	0.00680	1.159
F	mg/L	4	2.00	0.0626	1.3688	0.13	0.881
Fe	mg/L	--	0.30	235.0000	0.8100	0.202	1.851
Hardness	mg/L	--		5,435.69		77.3	59.641
K	mg/L	--		49.0000	17.0130	1.365	11.114
Mg	mg/L	--		1,030.00	11.4701	3.98	14.117
Mn	mg/L	--	0.05	47.0000	0.3145	0.039	0.462
Na	mg/L	--		400.79	83.6719	8.64	56.281
Ni	mg/L	0.100		762.00	0.0816	0.001	4.205
Pb	mg/L	0.015		0.0528	0.0064	0.00050	0.004
Sb	mg/L	0.006		0.0800	0.0747	0.0015	0.046
Se	mg/L	0.030		0.0029	0.0042	0.0001	0.003
SO ₄	mg/L	--	250.00	9,600.00	185.6043	13.6	170.186
Tl	mg/L	6E-04		0.0001	0.0007	0.001	0.001
V	mg/L	0.050		0.19		0.00	0.001
Zn	mg/L	2	5.00	26.0000	0.090	0.00875	0.200

Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge concentrations are average groundwater quality data from MW-05-2 with non-detects set at 1/2 the detection limit

Background concentrations are predicted East Pit concentrations during West Pit Filling

Table 6-17. Predicted Groundwater Concentrations - Screening Level Model - Proposed Action, Category 3 Stockpile Flow Path - High Liner Leakage

Source Proportional Contribution

	Surficial Deposits
	Partridge River
Category 3	2.809E-02
Recharge	0.3847
Up-Gradient (East Pit)	0.5872

Parameter	Units	GW Standard	EPA sMCL	Cat 3 Predicted Concentrations Post-Closure	East Pit Predicted Concentrations During West Pit Flooding (Background)	Recharge/ background concentration	Surficial Deposits
							Predicted concentration, Partridge River
Ag	mg/L	0.030	0.10	0.0007	0.0011	0.00075	0.001
Al	mg/L	--	0.05	83.0000	1.4966	0.1768	3.278
As	mg/L	0.010		0.7100	0.0992	0.00210	0.079
B	mg/L	0.600		0.7600	0.2263	0.02125	0.162
Ba	mg/L	2		0.1900	0.1254	0.00500	0.081
Be	mg/L	8.0E-05		0.0023	0.0002	0.00010	0.000
Ca	mg/L	--		496.99	105.9401	24.35	85.536
Cd	mg/L	0.004		0.0149	0.0002	0.00010	0.001
Cl	mg/L	--	250.00	10.8576	6.1676	1.21	4.392
Co	mg/L	--		44.0000	0.0083	0.00050	1.241
Cu	mg/L	1.3	1.00	202.00	0.0900	0.00680	5.729
F	mg/L	4	2.00	0.0627	1.2681	0.13	0.796
Fe	mg/L	--	0.30	235.0000	0.8100	0.202	7.154
Hardness	mg/L	--		5,435.69		77.3	182.415
K	mg/L	--		49.0000	17.3531	1.365	12.091
Mg	mg/L	--		1,030.00	12.3288	3.98	37.701
Mn	mg/L	--	0.05	47.0000	0.3044	0.039	1.514
Na	mg/L	--		338.00	87.2204	8.64	64.034
Ni	mg/L	0.100		762.00	0.0819	0.001	21.452
Pb	mg/L	0.015		0.0528	0.0065	0.00050	0.005
Sb	mg/L	0.006		0.0800	0.0039	0.0015	0.005
Se	mg/L	0.030		0.0029		0.0001	0.000
SO ₄	mg/L	--	250.00	9,600.00	194.3083	13.6	388.977
Tl	mg/L	6E-04		0.0001	0.0007	0.001	0.001
V	mg/L	0.050		0.19		0.00	0.005
Zn	mg/L	2	5.00	26.0000	0.0898	0.00875	0.786

Groundwater standard exceedance

No applicable standard

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Recharge concentrations are average groundwater quality data from MW-05-2 with non-detects set at 1/2 the detection limit

Background concentrations are predicted East Pit concentrations during West Pit Filling

Table 6-18. Predicted Groundwater Concentrations - Screening Level Model - Proposed Action Category 3 Lean Ore Stockpile Flow Path - Low Liner Leakage

Source Proportional Contribution

	Surficial Deposits
	Partridge River
Category 3 Lean Ore	1.396E-04
Recharge/Background	0.9999

						Surficial Deposits
Parameter	Units	GW Standard	EPA sMCL	Cat 3 LO Predicted Concentrations Post Closure	Recharge/ background concentration	Predicted concentration, Partridge River
Ag	mg/L	0.030	0.10	0.0007	0.00075	0.001
Al	mg/L	--	0.05	83.0000	0.1768	0.188
As	mg/L	0.010	--	0.7100	0.00210	0.002
B	mg/L	0.600	--	0.7600	0.02125	0.021
Ba	mg/L	2	--	0.1900	0.00500	0.005
Be	mg/L	8.0E-05	--	0.0023	0.00010	0.00010
Ca	mg/L	--	--	540.00	24.35	24.422
Cd	mg/L	0.004	--	0.0149	0.00010	0.00010
Cl	mg/L	--	250.00	29.6384	1.21	1.214
Co	mg/L	--	--	44.0000	0.00050	0.007
Cu	mg/L	1.3	1.00	202.00	0.00680	0.035
F	mg/L	4	2.00	0.0622	0.13	0.130
Fe	mg/L	--	0.30	235.0000	0.202	0.235
Hardness	mg/L	--	--	5,435.69	77.3	78.048
K	mg/L	--	--	49.0000	1.365	1.372
Mg	mg/L	--	--	1,030.00	3.98	4.123
Mn	mg/L	--	0.05	47.0000	0.039	0.045
Na	mg/L	--	--	681.00	8.64	8.734
Ni	mg/L	0.100	--	762.00	0.001	0.107
Pb	mg/L	0.015	--	0.0528	0.00050	0.001
Sb	mg/L	0.006	--	0.0800	0.0015	0.002
Se	mg/L	0.030	--	0.0029	0.0001	0.000
SO ₄	mg/L	--	250.00	9,600.00	13.6	14.938
Tl	mg/L	6E-04	--	0.0001	0.001	0.001
V	mg/L	0.050	--	0.19	0.00	0.000
Zn	mg/L	2	5.00	26.0000	0.00875	0.012

 Groundwater standard exceedance

 EPA sMCL exceedance

-- No applicable standard

Recharge/background concentrations are average groundwater quality data from MW-05-2 with non-detects set at 1/2 the detection limit

Table 6-19. Predicted Groundwater Concentrations - Screening Level Model - Proposed Action Category 3 Lean Ore Stockpile Flow Path - Average Liner Leakage

Source Proportional Contribution

	Surficial Deposits
	Partridge River
Category 3 Lean Ore	2.328E-04
Recharge/Background	0.9998

Parameter	Units	GW Standard	EPA sMCL	Cat 3 LO Predicted Concentrations Post Closure	Recharge/ background concentration	Surficial Deposits
						Predicted concentration, Partridge River
Ag	mg/L	0.030	0.10	0.0007	0.00075	0.001
Al	mg/L	--	0.05	83.0000	0.1768	0.196
As	mg/L	0.010	--	0.7100	0.00210	0.002
B	mg/L	0.600	--	0.7600	0.02125	0.021
Ba	mg/L	2	--	0.1900	0.00500	0.005
Be	mg/L	8.0E-05	--	0.0023	0.00010	0.00010
Ca	mg/L	--	--	540.0000	24.35	24.470
Cd	mg/L	0.004	--	0.0149	0.00010	0.00010
Cl	mg/L	--	250.00	17.1151	1.21	1.214
Co	mg/L	--	--	44.0000	0.00050	0.011
Cu	mg/L	1.3	1.00	202.0000	0.00680	0.054
F	mg/L	4	2.00	0.0625	0.13	0.130
Fe	mg/L	--	0.30	235.0000	0.202	0.257
Hardness	mg/L	--	--	5,435.6906	77.3	78.547
K	mg/L	--	--	49.0000	1.365	1.376
Mg	mg/L	--	--	1,030.0000	3.98	4.219
Mn	mg/L	--	0.05	47.0000	0.039	0.049
Na	mg/L	--	--	543.2659	8.64	8.764
Ni	mg/L	0.100	--	762.0000	0.001	0.178
Pb	mg/L	0.015	--	0.0528	0.00050	0.001
Sb	mg/L	0.006	--	0.0800	0.0015	0.002
Se	mg/L	0.030	--	0.0029	0.0001	0.000
SO ₄	mg/L	--	250.00	9,600.0000	13.6	15.832
Tl	mg/L	6E-04	--	0.0001	0.001	0.001
V	mg/L	0.050	--	0.1900	0.00	0.000
Zn	mg/L	2	5.00	26.0000	0.00875	0.015

 Groundwater standard exceedance

 EPA sMCL exceedance

-- No applicable standard

Recharge/background concentrations are average groundwater quality data from MW-05-2 with non-detects set at 1/2 the detection limit

Table 6-20. Predicted Groundwater Concentrations - Screening Level Model - Proposed Action, Category 3 Lean Ore Stockpile Flow Path - High Liner Leakage

Source Proportional Contribution

	Surficial Deposits Partridge River
Category 3 Lean Ore	7.800E-03
Recharge/Background	0.9922

Parameter	Units	GW Standard	EPA sMCL	Cat 3 LO Predicted Concentrations Post Closure	Recharge/ background concentration	Surficial Deposits
						Predicted concentration, Partridge River
Ag	mg/L	0.030	0.10	0.0007	0.00075	0.001
Al	mg/L	--	0.05	83.0000	0.1768	0.823
As	mg/L	0.010	--	0.7100	0.00210	0.008
B	mg/L	0.600	--	0.7600	0.02125	0.027
Ba	mg/L	2	--	0.1900	0.00500	0.006
Be	mg/L	8.0E-05	--	0.0023	0.00010	0.000
Ca	mg/L	--	--	540.00	24.35	28.372
Cd	mg/L	0.004	--	0.0149	0.00010	0.000
Cl	mg/L	--	250.00	11.9135	1.21	1.293
Co	mg/L	--	--	44.0000	0.00050	0.344
Cu	mg/L	1.3	1.00	202.00	0.00680	1.582
F	mg/L	4	2.00	0.0627	0.13	0.129
Fe	mg/L	--	0.30	235.0000	0.202	2.033
Hardness	mg/L	--	--	5,435.69	77.3	119.095
K	mg/L	--	--	49.0000	1.365	1.737
Mg	mg/L	--	--	1,030.00	3.98	11.983
Mn	mg/L	--	0.05	47.0000	0.039	0.405
Na	mg/L	--	--	378.02	8.64	11.521
Ni	mg/L	0.100	--	762.00	0.001	5.945
Pb	mg/L	0.015	--	0.0528	0.00050	0.001
Sb	mg/L	0.006	--	0.0800	0.0015	0.002
Se	mg/L	0.030	--	0.0029	0.0001	0.000
SO ₄	mg/L	--	250.00	9,600.00	13.6	88.374
Tl	mg/L	6E-04	--	0.0001	0.001	0.001
V	mg/L	0.050	--	0.19	0.00	0.001
Zn	mg/L	2	5.00	26.0000	0.00875	0.211

Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge/background concentrations are average groundwater quality data from MW-05-2 with non-detects set at 1/2 the detection limit

Table 6-21. Predicted Groundwater Concentrations - Screening Level Model - Proposed Action, Lean Ore Surge Pile Flow Path - Low Liner Leakage

Source Area Proportional Contributions

	Surficial Deposits
	Partridge River/ Property Boundary
Lean Ore Surge Pile	7.71E-05
Recharge	0.6143
Background	0.3856

Parameter	Units	GW Standard	EPA sMCL	Lean Ore Surge Pile Predicted Concentrations Post- Closure	Recharge/ background concentration, surficial deposits	Surficial Deposits
						Predicted concentration, Partridge River/property boundary
Ag	mg/L	0.030	0.10	0.0007	0.00075	0.001
Al	mg/L	--	0.05	83.0000	0.1768	0.183
As	mg/L	0.010	--	0.2847	0.00210	0.0021
B	mg/L	0.600	--	0.7600	0.02125	0.0213
Ba	mg/L	2	--	0.1900	0.00500	0.0050
Be	mg/L	8.0E-05	--	0.0023	0.00010	1.00E-04
Ca	mg/L	--	--	480.00	24.35	24.4
Cd	mg/L	0.004	--	0.0149	0.00010	0.0001
Cl	mg/L	--	250.00	2.5396	1.21	1.2
Co	mg/L	--	--	20.3955	0.00050	0.002
Cu	mg/L	1.3	1.00	3.68	0.00680	0.007
F	mg/L	4	2.00	0.0630	0.13	0.130
Fe	mg/L	--	0.30	235.0000	0.202	0.220
Hardness	mg/L	--	--	3,900.70	77.3	77.6
K	mg/L	--	--	38.0000	1.365	1.4
Mg	mg/L	--	--	657.00	3.98	4.0
Mn	mg/L	--	0.05	46.1159	0.039	0.042
Na	mg/L	--	--	248.25	8.64	8.7
Ni	mg/L	0.100	--	249.24	0.001	0.020
Pb	mg/L	0.015	--	0.0528	0.00050	0.001
Sb	mg/L	0.006	--	0.0800	0.0015	0.0015
Se	mg/L	0.030	--	0.0029	0.0001	0.0001
SO ₄	mg/L	--	250.00	9,600.00	13.6	14.3
Tl	mg/L	6E-04	--	0.0001	0.001	0.001
V	mg/L	0.050	--	0.04	0.00	0.000003
Zn	mg/L	2	5.00	26.0000	0.00875	0.011

Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge/background concentrations are average groundwater quality data from MW-05-2 with non-detects set at 1/2 the detection limit

Table 6-22. Predicted Groundwater Concentrations - Screening Level Model - Proposed Action, Lean Ore Surge Pile Flow Path - Average Liner Leakage

Source Area Proportional Contributions

	Surficial Deposits
	Partridge River/ Property Boundary
Lean Ore Surge Pile	1.26E-04
Recharge	0.6148
Background	0.3851

Parameter	Units	GW Standard	EPA sMCL	Lean Ore Surge Pile Predicted Concentrations Post- Closure	Recharge/ background concentration, surficial deposits	Surficial Deposits
						Predicted concentration, Partridge River/property boundary
Ag	mg/L	0.030	0.10	0.0007	0.00075	0.001
Al	mg/L	--	0.05	83.0000	0.1768	0.187
As	mg/L	0.010	--	0.1644	0.00210	0.0021
B	mg/L	0.600	--	0.7600	0.02125	0.0213
Ba	mg/L	2	--	0.1900	0.00500	0.0050
Be	mg/L	8.0E-05	--	0.0023	0.00010	1.00E-04
Ca	mg/L	--	--	334.58	24.35	24.4
Cd	mg/L	0.004	--	0.0149	0.00010	0.0001
Cl	mg/L	--	250.00	1.4665	1.21	1.2
Co	mg/L	--	--	11.7777	0.00050	0.002
Cu	mg/L	1.3	1.00	2.13	0.00680	0.007
F	mg/L	4	2.00	0.0631	0.13	0.130
Fe	mg/L	--	0.30	235.0000	0.202	0.232
Hardness	mg/L	--	--	2,395.66	77.3	77.6
K	mg/L	--	--	38.0000	1.365	1.4
Mg	mg/L	--	--	379.39	3.98	4.0
Mn	mg/L	--	0.05	26.6303	0.039	0.042
Na	mg/L	--	--	143.36	8.64	8.7
Ni	mg/L	0.100	--	143.93	0.001	0.019
Pb	mg/L	0.015	--	0.0528	0.00050	0.001
Sb	mg/L	0.006	--	0.0603	0.0015	0.0015
Se	mg/L	0.030	--	0.0029	0.0001	0.0001
SO ₄	mg/L	--	250.00	9,600.00	13.6	14.8
TI	mg/L	6E-04	--	0.0001	0.001	0.001
V	mg/L	0.050	--	0.02	0.00	0.0000
Zn	mg/L	2	5.00	26.0000	0.00875	0.012

Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge/background concentrations are average groundwater quality data from MW-05-2 with non-detects set at 1/2 the detection limit

Table 6-23. Predicted Groundwater Concentrations - Screening Level Model - Proposed Action, Lean Ore Surge Pile Flow Path - High Liner Leakage

Source Area Proportional Contributions

	Surficial Deposits Partridge River/ Property Boundary
Lean Ore Surge Pile	3.56E-03
Recharge	0.6144
Background	0.3820

Parameter	Units	GW Standard	EPA sMCL	Lean Ore Surge Pile Predicted Concentrations Post- Closure	Recharge/ background concentration, surficial deposits	Surficial Deposits Predicted concentration, Partridge River/property boundary
Ag	mg/L	0.030	0.10	0.0007	0.00075	0.001
Al	mg/L	--	0.05	83.0000	0.1768	0.472
As	mg/L	0.010	--	0.1144	0.00210	0.0025
B	mg/L	0.600	--	0.7600	0.02125	0.0239
Ba	mg/L	2	--	0.1900	0.00500	0.0057
Be	mg/L	8.0E-05	--	0.0023	0.00010	1.08E-04
Ca	mg/L	--	--	232.90	24.35	25.1
Cd	mg/L	0.004	--	0.0149	0.00010	0.0002
Cl	mg/L	--	250.00	1.0208	1.21	1.2
Co	mg/L	--	--	8.1982	0.00050	0.030
Cu	mg/L	1.3	1.00	1.48	0.00680	0.012
F	mg/L	4	2.00	0.0631	0.13	0.130
Fe	mg/L	--	0.30	235.0000	0.202	1.039
Hardness	mg/L	--	--	1,667.57	77.3	83.0
K	mg/L	--	--	38.0000	1.365	1.5
Mg	mg/L	--	--	264.09	3.98	4.9
Mn	mg/L	--	0.05	18.5368	0.039	0.104
Na	mg/L	--	--	99.79	8.64	9.0
Ni	mg/L	0.100	--	100.19	0.001	0.358
Pb	mg/L	0.015	--	0.0528	0.00050	0.001
Sb	mg/L	0.006	--	0.0420	0.0015	0.0016
Se	mg/L	0.030	--	0.0029	0.0001	0.0001
SO ₄	mg/L	--	250.00	9,600.00	13.6	47.8
Tl	mg/L	6E-04	--	0.0001	0.001	0.001
V	mg/L	0.050	--	0.02	0.00	0.0001
Zn	mg/L	2	5.00	26.0000	0.00875	0.101

Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge/background concentrations are average groundwater quality data from MW-05-2 with non-detects set at 1/2 the detection limit

Table 6-24. Summary of Potential Groundwater Criteria Exceedances in either Bedrock or the Surficial Aquifer using Screening Level Models for Mine Site-Proposed Action

Model	Potential Groundwater Exceedances
Category 1/2 – Overburden Stockpile	As, Sb, SO ₄ , <u>Al</u> , <u>Fe</u> , <u>Mn</u>
West Pit	As, Sb, <u>Al</u> , <u>Fe</u> , <u>Mn</u>
East Pit and Category 4 Waste Rock Stockpile	Fe, Mn, Ni, Sb, <u>Al</u> ,
Category 3 Waste Rock Stockpile	As, Cu, Fe, Mn, Ni, Sb, SO ₄ , <u>Al</u>
Category 3 Lean Ore Stockpile	Cu, Fe, Mn, Ni, <u>Al</u>
Lean Ore Surge Pile	Fe, Mn, Ni, <u>Al</u>

NOTE: Background concentrations of the parameters in italics and underlined exceed criteria

Table 6-25. Transient Model Stress Period Set-Up

Stress Period		Duration (days)	Period Simulated	Stockpile Leakage/Concentration Data Used
1		1825	Year 0 – Year 5	Year 5
2		1825	Year 6 – Year 10	Year 10
3		1825	Year 11 – Year 15	Year 15
4		1825	Year 16 – Year 20	Year 20
Low Linear Leakage	5	20440	Year 21 – Year 76	Closure Data
	6	702260	Year 77 – Year 2000	Post-Closure Data
Ave. Linear Leakage	5	16790	Year 21 – Year 66	Closure Data
	6	705910	Year 67 – Year 2000	Post-Closure Data
High Linear Leakage	5	14600	Year 21 – Year 60	Closure Data
	6	708100	Year 61 – Year 2000	Post-Closure Data

Table 6-26. Source concentrations used in transient groundwater quality models with low liner leakage - Mine Site Proposed Action

Model	Source	Parameter	Mine Year 5 (mg/L)	Mine Year 10 (mg/L)	Mine Year 15 (mg/L)	Mine Year 20 (mg/L)	Closure (mg/L)	Post-Closure (mg/L)
Category 1/2 - Overburden Stockpile Model	Category 1/2 Stockpile	As	0.71	0.71	0.71	0.71	0.71	0.71
	Overburden portion of Stockpile	As	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027
	Background/Recharge	As	0.00283	0.00283	0.00283	0.00283	0.00283	0.00283
	Category 1/2 Stockpile	Sb	0.08	0.08	0.08	0.08	0.08	0.08
	Overburden portion of Stockpile	Sb	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
	Background/Recharge	Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
	Category 1/2 Stockpile	SO ₄	514	1289	2129	2129	2129	2129
	Overburden portion of Stockpile	SO ₄	68.30	68.30	68.30	68.30	68.30	68.30
West Pit Model	Background/Recharge	SO ₄	17.57	17.57	17.57	17.57	17.57	17.57
	West Pit	As	--	--	--	--	--	0.097
	Background/Recharge	As	--	--	--	--	--	0.0028
	West Pit	Sb	--	--	--	--	--	0.12
	Background/Recharge	Sb	--	--	--	--	--	0.0015
	West Pit	SO ₄	--	--	--	--	--	246.99
Lean Ore Surge Pile Model	Background/Recharge	SO ₄	--	--	--	--	--	17.57
	Lean Ore Surge Pile	Fe	235	235	235	235	0.202	0.202
	Background/Recharge	Fe	0.202	0.202	0.202	0.202	0.202	0.202
	Lean Ore Surge Pile	Mn	4.8	6.9	18.5	14.9	0.039	0.039
	Background/Recharge	Mn	0.039	0.039	0.039	0.039	0.039	0.039
	Lean Ore Surge Pile	Ni	26.0	37.4	100.2	80.4	0.001	0.001
	Background/Recharge	Ni	0.001	0.001	0.001	0.001	0.001	0.001
	Lean Ore Surge Pile	SO ₄	401.86	6755	9600	9600	13.6	13.6
East Pit and Category 4 Stockpile Model	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6
	Category 4 Stockpile	Fe	235	235	235	235	235	235
	East Pit/Upgradient Source (Overburden)	Fe	0.202	0.202	0.202	0.202	0.811	0.810
	East Pit/Upgradient Source (Bedrock)	Fe	1.36	1.36	1.36	1.36	1.48	1.36
	Background/Recharge	Fe	0.202	0.202	0.202	0.202	0.202	0.202
	Category 4 Stockpile	Mn	36.3	47.0	47.0	47.0	47.0	47.0
	East Pit/Upgradient Source (Overburden)	Mn	0.039	0.039	0.039	0.039	0.328	0.178
	East Pit/Upgradient Source (Bedrock)	Mn	0.076	0.076	0.076	0.076	0.60	0.30
	Background/Recharge	Mn	0.039	0.039	0.039	0.039	0.039	0.039
	Category 4 Stockpile	Ni	78.2	178.8	237.5	762.0	762.0	762.0
	East Pit/Upgradient Source (Overburden)	Ni	0.001	0.001	0.001	0.001	0.084	0.015
	East Pit/Upgradient Source (Bedrock)	Ni	0.019	0.019	0.019	0.019	0.15	0.025
	Background/Recharge	Ni	0.001	0.001	0.001	0.001	0.001	0.001
	Category 4 Stockpile	Sb	0.08	0.08	0.08	0.08	0.08	0.08
	East Pit/Upgradient Source (Overburden)	Sb	0.0015	0.0015	0.0015	0.0015	0.0811	0.0285
	East Pit/Upgradient Source (Bedrock)	Sb	0.0015	0.0015	0.0015	0.0015	0.141	0.0402
	Background/Recharge	Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
	Category 4 Stockpile	SO ₄	9600	9600	9600	9600	9600	9600
	East Pit/Upgradient Source (Overburden)	SO ₄	13.6	13.6	13.6	13.6	321.8	178.8
	East Pit/Upgradient Source (Bedrock)	SO ₄	16.8	16.8	16.8	16.8	339.8	95.8
Category 3 Stockpile Model	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6
	Category 3 Stockpile	As	0.71	0.71	0.71	0.71	0.71	0.71
	East Pit/Upgradient Source	As	0.0021	0.0021	0.0021	0.0021	0.08727	0.02386
	Background/Recharge	As	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021
	Category 3 Stockpile	Cu	0.092	139.7	202	202	202	202
	East Pit/Upgradient Source	Cu	0.0068	0.0068	0.0068	0.0068	0.096	0.065
	Background/Recharge	Cu	0.0068	0.0068	0.0068	0.0068	0.0068	0.0068
	Category 3 Stockpile	Fe	0.810	148	219	235	235	235
	East Pit/Upgradient Source	Fe	0.202	0.202	0.202	0.202	0.811	0.810
	Background/Recharge	Fe	0.202	0.202	0.202	0.202	0.202	0.202
	Category 3 Stockpile	Mn	0.75	47	47	47	47	47
	East Pit/Upgradient Source	Mn	0.039	0.039	0.039	0.039	0.328	0.178
	Background/Recharge	Mn	0.039	0.039	0.039	0.039	0.039	0.039
	Category 3 Stockpile	Ni	0.86	762	762	762	762	762
	East Pit/Upgradient Source	Ni	0.001	0.001	0.001	0.001	0.084	0.015
	Background/Recharge	Ni	0.001	0.001	0.001	0.001	0.001	0.001
	Category 3 Stockpile	Sb	0.08	0.08	0.08	0.08	0.080	0.080
	East Pit/Upgradient Source	Sb	0.0015	0.0015	0.0015	0.0015	0.0811	0.0285
	Background/Recharge	Sb	0.0015	0.0015	0.0015	0.0015	0.002	0.002
Category 3 Lean Ore Stockpile Model	Category 3 Stockpile	SO ₄	2340	9600	9600	9600	9600	9600
	East Pit/Upgradient Source	SO ₄	13.6	13.6	13.6	13.6	321.8	178.8
	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6
	Category 3 Lean Ore Stockpile	Cu	0.092	202	202	202	202	202
	Background/Recharge	Cu	0.0068	0.0068	0.0068	0.0068	0.0068	0.0068
	Category 3 Lean Ore Stockpile	Fe	0.81	95.6	127.3	235	235	235
	Background/Recharge	Fe	0.202	0.202	0.202	0.202	0.202	0.202
	Category 3 Lean Ore Stockpile	Mn	0.75	47.0	47.0	47.0	47.0	47.0
Category 3 Lean Ore Stockpile Model	Background/Recharge	Mn	0.039	0.039	0.039	0.039	0.039	0.039
	Category 3 Lean Ore Stockpile	Ni	0.86	762.00	762.00	762.00	762.00	762.00
	Background/Recharge	Ni	0.001	0.001	0.001	0.001	0.001	0.001
	Category 3 Lean Ore Stockpile	SO ₄	2340	9600	9600	9600	9600	9600
	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6
	Category 3 Lean Ore Stockpile	Cu	0.092	202	202	202	202	202
	Background/Recharge	Cu	0.0068	0.0068	0.0068	0.0068	0.0068	0.0068
	Category 3 Lean Ore Stockpile	Fe	0.81	95.6	127.3	235	235	235

Table 6-27. Source concentrations used in transient groundwater quality models with average liner leakage - Mine Site Proposed Action

Model	Source	Parameter	Mine Year 5 (mg/L)	Mine Year 10 (mg/L)	Mine Year 15 (mg/L)	Mine Year 20 (mg/L)	Closure (mg/L)	Post-Closure (mg/L)
Category 1/2 - Overburden Stockpile Model	Category 1/2 Stockpile	As	0.49	0.71	0.71	0.71	0.71	0.71
	Overburden portion of Stockpile	As	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027
	Background/Recharge	As	0.00283	0.00283	0.00283	0.00283	0.00283	0.00283
	Category 1/2 Stockpile	Sb	0.08	0.08	0.08	0.08	0.08	0.08
	Overburden portion of Stockpile	Sb	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
	Background/Recharge	Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
	Category 1/2 Stockpile	SO ₄	284	684	981	981	981	981
	Overburden portion of Stockpile	SO ₄	68.30	68.30	68.30	68.30	68.30	68.30
West Pit Model	Background/Recharge	SO ₄	17.57	17.57	17.57	17.57	17.57	17.57
	West Pit	As	--	--	--	--	--	0.11
	Background/Recharge	As	--	--	--	--	--	0.0028
	West Pit	Sb	--	--	--	--	--	0.11
	Background/Recharge	Sb	--	--	--	--	--	0.0015
	West Pit	SO ₄	--	--	--	--	--	173.26
Lean Ore Surge Pile Model	Background/Recharge	SO ₄	--	--	--	--	--	17.57
	Lean Ore Surge Pile	Fe	235	235	235	235	0.202	0.202
	Background/Recharge	Fe	0.202	0.202	0.202	0.202	0.202	0.202
	Lean Ore Surge Pile	Mn	6.9	9.9	26.6	21.4	0.039	0.039
	Background/Recharge	Mn	0.039	0.039	0.039	0.039	0.039	0.039
	Lean Ore Surge Pile	Ni	37.3	53.7	143.9	115.5	0.001	0.001
	Background/Recharge	Ni	0.001	0.001	0.001	0.001	0.001	0.001
	Lean Ore Surge Pile	SO ₄	3901	5614	9600	9600	13.6	13.6
East Pit and Category 4 Stockpile Model	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6
	Category 4 Stockpile	Fe	235	235	235	235	235	235
	East Pit/Upgradient Source (Overburden)	Fe	0.202	0.202	0.202	0.202	0.810	0.810
	East Pit/Upgradient Source (Bedrock)	Fe	1.36	1.36	1.36	1.36	1.71	1.23
	Background/Recharge	Fe	0.202	0.202	0.202	0.202	0.202	0.202
	Category 4 Stockpile	Mn	20.1	47.0	47.0	47.0	47.0	47.0
	East Pit/Upgradient Source (Overburden)	Mn	0.039	0.039	0.039	0.039	0.323	0.146
	East Pit/Upgradient Source (Bedrock)	Mn	0.076	0.076	0.076	0.076	0.682	0.221
	Background/Recharge	Mn	0.039	0.039	0.039	0.039	0.039	0.039
	Category 4 Stockpile	Ni	113	265	355	762	762	762
	East Pit/Upgradient Source (Overburden)	Ni	0.001	0.001	0.001	0.001	0.081	0.0086
	East Pit/Upgradient Source (Bedrock)	Ni	0.019	0.019	0.019	0.019	0.166	0.0126
	Background/Recharge	Ni	0.001	0.001	0.001	0.001	0.001	0.001
	Category 4 Stockpile	Sb	0.047	0.080	0.080	0.080	0.080	0.080
	East Pit/Upgradient Source (Overburden)	Sb	0.0015	0.0015	0.0015	0.0015	0.080	0.021
	East Pit/Upgradient Source (Bedrock)	Sb	0.0015	0.0015	0.0015	0.0015	0.16	0.026
	Background/Recharge	Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
	Category 4 Stockpile	SO ₄	9600	9600	9600	9600	9600	9600
	East Pit/Upgradient Source (Overburden)	SO ₄	13.6	13.6	13.6	13.6	324.3	132.4
	East Pit/Upgradient Source (Bedrock)	SO ₄	16.8	16.8	16.8	16.8	352.4	46.4
Category 3 Stockpile Model	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6
	Category 3 Stockpile	As	0.71	0.71	0.71	0.71	0.71	0.71
	East Pit/Upgradient Source	As	0.0021	0.0021	0.0021	0.0021	0.0879	0.0229
	Background/Recharge	As	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021
	Category 3 Stockpile	Cu	0.090	201	202	202	202	202
	East Pit/Upgradient Source	Cu	0.0068	0.0068	0.0068	0.0068	0.094	0.051
	Background/Recharge	Cu	0.0068	0.0068	0.0068	0.0068	0.0068	0.0068
	Category 3 Stockpile	Fe	0.810	83	120	235	235	235
	East Pit/Upgradient Source	Fe	0.202	0.202	0.202	0.202	0.810	0.810
	Background/Recharge	Fe	0.202	0.202	0.202	0.202	0.202	0.202
	Category 3 Stockpile	Mn	0.75	47	47	47	47	47
	East Pit/Upgradient Source	Mn	0.039	0.039	0.039	0.039	0.323	0.146
	Background/Recharge	Mn	0.039	0.039	0.039	0.039	0.039	0.039
	Category 3 Stockpile	Ni	0.86	428.9	623.6	762	762	762
	East Pit/Upgradient Source	Ni	0.001	0.001	0.001	0.001	0.081	0.0086
	Background/Recharge	Ni	0.001	0.001	0.001	0.001	0.001	0.001
	Category 3 Stockpile	Sb	0.08	0.08	0.08	0.08	0.080	0.080
	East Pit/Upgradient Source	Sb	0.0015	0.0015	0.0015	0.0015	0.0796	0.0213
	Background/Recharge	Sb	0.0015	0.0015	0.0015	0.0015	0.002	0.002
Category 3 Lean Ore Stockpile Model	Category 3 Stockpile	SO ₄	2340	9600	9600	9600	9600	9600
	East Pit/Upgradient Source	SO ₄	13.6	13.6	13.6	13.6	324.3	132.4
	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6
	Category 3 Lean Ore Stockpile	Cu	0.092	202	202	202	202	202
	Background/Recharge	Cu	0.0068	0.0068	0.0068	0.0068	0.0068	0.0068
	Category 3 Lean Ore Stockpile	Fe	0.81	137.8	184	235	235	235
	Background/Recharge	Fe	0.202	0.202	0.202	0.202	0.202	0.202
	Category 3 Lean Ore Stockpile	Mn	0.75	47	47	47	47	47
	Background/Recharge	Mn	0.039	0.039	0.039	0.039	0.039	0.039
Category 3 Lean Ore Stockpile Model	Category 3 Lean Ore Stockpile	Ni	0.86	715.91	762.00	762.00	762.00	762.00
	Background/Recharge	Ni	0.001	0.001	0.001	0.001	0.001	0.001
	Category 3 Lean Ore Stockpile	SO ₄	2340	9600	9600	9600	9600	9600
	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6

Table 6-28. Source concentrations used in transient groundwater quality models with high liner leakage - Mine Site Proposed Action

Model	Source	Parameter	Mine Year 5 (mg/L)	Mine Year 10 (mg/L)	Mine Year 15 (mg/L)	Mine Year 20 (mg/L)	Closure (mg/L)	Post-Closure (mg/L)
Category 1/2 - Overburden Stockpile Model	Category 1/2 Stockpile	As	0.34	0.71	0.71	0.71	0.71	0.71
	Overburden portion of Stockpile	As	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027
	Background/Recharge	As	0.00283	0.00283	0.00283	0.00283	0.00283	0.00283
	Category 1/2 Stockpile	Sb	0.08	0.08	0.08	0.08	0.08	0.08
	Overburden portion of Stockpile	Sb	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
	Background/Recharge	Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
	Category 1/2 Stockpile	SO ₄	198	475	681	681	681	681
	Overburden portion of Stockpile	SO ₄	68.30	68.30	68.30	68.30	68.30	68.30
West Pit Model	Background/Recharge	SO ₄	17.57	17.57	17.57	17.57	17.57	17.57
	West Pit	As	--	--	--	--	--	0.20
	Background/Recharge	As	--	--	--	--	--	0.0028
	West Pit	Sb	--	--	--	--	--	0.11
	Background/Recharge	Sb	--	--	--	--	--	0.0015
	West Pit	SO ₄	--	--	--	--	--	211.84
Lean Ore Surge Pile Model	Background/Recharge	SO ₄	--	--	--	--	--	17.57
	Lean Ore Surge Pile	Fe	235	235	235	235	0.202	0.202
	Background/Recharge	Fe	0.202	0.202	0.202	0.202	0.202	0.202
	Lean Ore Surge Pile	Mn	12.0	17.2	46.1	37.0	0.039	0.039
	Background/Recharge	Mn	0.039	0.039	0.039	0.039	0.039	0.039
	Lean Ore Surge Pile	Ni	64.6	93.0	249.2	200.1	0.001	0.001
	Background/Recharge	Ni	0.001	0.001	0.001	0.001	0.001	0.001
	Lean Ore Surge Pile	SO ₄	6755	9600	9600	9600	13.6	13.6
East Pit and Category 4 Stockpile Model	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6
	Category 4 Stockpile	Fe	235	235	235	235	235	235
	East Pit/Upgradient Source (Overburden)	Fe	0.202	0.202	0.202	0.202	0.811	0.810
	East Pit/Upgradient Source (Bedrock)	Fe	1.36	1.36	1.36	1.36	1.40	0.943
	Background/Recharge	Fe	0.202	0.202	0.202	0.202	0.202	0.202
	Category 4 Stockpile	Mn	14.5	33.1	43.9	47.0	47.0	47.0
	East Pit/Upgradient Source (Overburden)	Mn	0.039	0.039	0.039	0.039	0.330	0.185
	East Pit/Upgradient Source (Bedrock)	Mn	0.076	0.076	0.076	0.076	0.572	0.215
	Background/Recharge	Mn	0.039	0.039	0.039	0.039	0.039	0.039
	Category 4 Stockpile	Ni	78	179	238	762	762	762
	East Pit/Upgradient Source (Overburden)	Ni	0.001	0.001	0.001	0.001	0.084	0.015
	East Pit/Upgradient Source (Bedrock)	Ni	0.019	0.019	0.019	0.019	0.142	0.017
	Background/Recharge	Ni	0.001	0.001	0.001	0.001	0.001	0.001
	Category 4 Stockpile	Sb	0.080	0.080	0.080	0.080	0.080	0.080
	East Pit/Upgradient Source (Overburden)	Sb	0.0015	0.0015	0.0015	0.0015	0.081	0.024
	East Pit/Upgradient Source (Bedrock)	Sb	0.0015	0.0015	0.0015	0.0015	0.14	0.026
	Background/Recharge	Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
	Category 4 Stockpile	SO ₄	8179	9600	9600	9600	9600	9600
	East Pit/Upgradient Source (Overburden)	SO ₄	13.6	13.6	13.6	13.6	313.6	96.5
	East Pit/Upgradient Source (Bedrock)	SO ₄	16.8	16.8	16.8	16.8	323.5	63.0
Category 3 Stockpile Model	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6
	Category 3 Stockpile	As	0.71	0.71	0.71	0.71	0.71	0.71
	East Pit/Upgradient Source	As	0.0021	0.0021	0.0021	0.0021	0.0878	0.0216
	Background/Recharge	As	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021
	Category 3 Stockpile	Cu	0.090	140	202	202	202	202
	East Pit/Upgradient Source	Cu	0.0068	0.0068	0.0068	0.0068	0.095	0.062
	Background/Recharge	Cu	0.0068	0.0068	0.0068	0.0068	0.0068	0.0068
	Category 3 Stockpile	Fe	0.810	57	83	235	235	235
	East Pit/Upgradient Source	Fe	0.202	0.202	0.202	0.202	0.811	0.810
	Background/Recharge	Fe	0.202	0.202	0.202	0.202	0.202	0.202
	Category 3 Stockpile	Mn	0.75	40.6	47	47	47	47
	East Pit/Upgradient Source	Mn	0.039	0.039	0.039	0.039	0.330	0.185
	Background/Recharge	Mn	0.039	0.039	0.039	0.039	0.039	0.039
	Category 3 Stockpile	Ni	0.86	298	433	762	762	762
	East Pit/Upgradient Source	Ni	0.001	0.001	0.001	0.001	0.084	0.015
	Background/Recharge	Ni	0.001	0.001	0.001	0.001	0.001	0.001
	Category 3 Stockpile	Sb	0.080	0.080	0.080	0.080	0.080	0.080
	East Pit/Upgradient Source	Sb	0.0015	0.0015	0.0015	0.0015	0.081	0.024
	Background/Recharge	Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
	Category 3 Stockpile	SO ₄	2235	9600	9600	9600	9600	9600
Category 3 Lean Ore Stockpile Model	East Pit/Upgradient Source	SO ₄	13.6	13.6	13.6	13.6	313.6	96.5
	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6
	Category 3 Lean Ore Stockpile	Cu	0.09	202	202	202	202	202
	Background/Recharge	Cu	0.0068	0.0068	0.0068	0.0068	0.0068	0.0068
	Category 3 Lean Ore Stockpile	Fe	0.81	95.62	127.28	235	235	235
	Background/Recharge	Fe	0.202	0.202	0.202	0.202	0.202	0.202
	Category 3 Lean Ore Stockpile	Mn	0.75	47	47	47	47	47
	Background/Recharge	Mn	0.039	0.039	0.039	0.039	0.039	0.039
	Category 3 Lean Ore Stockpile	Ni	0.86	496.80	661.30	762.00	762.00	762.00
	Background/Recharge	Ni	0.001	0.001	0.001	0.001	0.001	0.001
Category 3 Lean Ore Stockpile Model	Category 3 Lean Ore Stockpile	SO ₄	2340	9600	9600	9600	9600	9600
	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6

Table 6-29. K_d Parameters from EPA References Used in Mine Site-Proposed Action Analysis

Constituent	Results from Literature Study (U.S. EPA, 2005)			EPA Recommended Values (U.S. EPA, 1996b) (L/kg)	Values Used in Cross-Section Models (L/kg)
	Minimum K_d (L/kg)	Maximum K_d (L/kg)	Mean K_d (L/kg)		
Arsenic	2	20,000	16,000	25-31	25
Copper	1.3	4,000	320	--	22
Nickel	10	6,300	800	16-1900	16
Antimony	1.3	500	200	45	45

Table 6-30. Summary of maximum concentration data predicted using the transient groundwater quality models for Mine Site Proposed Action with low liner leakage (Page 1 of 2)

	Years 1-76		Years 77-2000		Final Concentration (mg/L)
	Maximum Concentration	Time of Max	Maximum Concentration	Time of Max	
	(mg/L)	(Year)	(mg/L)	(Year)	
Category 1/2 and Overburden Stockpile					
Arsenic					
No Sorption	0.019	76	0.14	168-2000	0.14
With Sorption	0.0028	1-76	0.0028	77-2000	0.0028
Antimony					
No Sorption	0.0027	76	0.016	167-2000	0.016
With Sorption	0.0015	1-76	0.0015	77-2000	0.0015
Sulfate					
No Sorption	64	76	460	218-2000	460
West Pit					
Arsenic					
No Sorption	---	---	0.041	487-2000	0.041
With Sorption	---	---	0.0021	77-112	0.0021
Antimony					
No Sorption	---	---	0.049	446-2000	0.049
With Sorption	---	---	0.0015	77-2000	0.0015
Sulfate					
No Sorption	---	---	110	391-2000	110
East Pit and Category 4 Stockpile					
Iron					
No Sorption	0.27	1-6	0.31	126-281	0.30
Manganese					
No Sorption	0.041	1-20, 40-66, 70-76	0.090	135-139	0.062
Nickel					
No Sorption	0.0059	57-61	0.019	129-144	0.0069
With Sorption	0.0010	1-76	0.0011	1956-2000	0.0011
Antimony					
No Sorption	0.0019	76	0.015	126-150	0.0059
With Sorption	0.0015	1-76	0.0015	77-2000	0.0015
Sulfate					
No Sorption	15	74-76	67	131-144	41

Table 6-30. Summary of maximum concentration data predicted using the transient groundwater quality models for Mine Site Proposed Action with low liner leakage (Page 2 of 2)

	Years 1-76		Years 77-2000		Final Concentration (mg/L)
	Maximum Concentration	Time of Max	Maximum Concentration	Time of Max	
	(mg/L)	(Year)	(mg/L)	(Year)	
Category 3 Stockpile					
Arsenic					
No Sorption	0.0033	76	0.045	371	0.016
With Sorption	0.0021	1-76	0.0021	77-2000	0.0021
Copper					
No Sorption	0.22	74-76	0.35	132-185	0.34
With Sorption	0.0068	1-76	0.011	1891-2000	0.011
Iron					
No Sorption	0.45	76	0.92	212-2000	0.92
Manganese					
No Sorption	0.093	76	0.25	142-164	0.19
Nickel					
No Sorption	0.22	76	1.2	277-426	1.1
With Sorption	0.0010	1-76	0.092	1997-2000	0.092
Antimony					
No Sorption	0.0016	42-76	0.041	370-373	0.018
With Sorption	0.0015	1-76	0.0016	1099-2000	0.0016
Sulfate					
No Sorption	26	76	180	142-167	130
Category 3 Lean Ore Stockpile					
Copper					
No Sorption	0.023	47-76	0.023	77-2000	0.023
With Sorption	0.0068	1-76	0.0074	1960-2000	0.0074
Iron					
No Sorption	0.22	47-76	0.22	77-2000	0.22
Manganese					
No Sorption	0.043	45-76	0.043	77-2000	0.043
Nickel					
No Sorption	0.064	52-57	0.061	77-2000	0.061
With Sorption	0.0010	1-76	0.012	1959-2000	0.012
Sulfate					
No Sorption	14	1-76	14.0	77-2000	14.0
Lean Ore Surge Pile					
Iron					
No Sorption	0.21	43-76	0.21	77-85	0.20
Manganese					
No Sorption	0.039	1-76	0.039	77-2000	0.039
Nickel					
No Sorption	0.0036	63	0.0028	77	0.0010
With Sorption	0.0010	1-76	0.0010	77-2000	0.0010
Sulfate					
No Sorption	14	1-76	14	77-2000	14

Table 6-31. Summary of maximum concentration data predicted using the transient groundwater quality models for Mine Site Proposed Action with average liner leakage (Page 1 of 2)

	Years 1-66		Years 67-2000		Final Concentration (mg/L)
	Maximum Concentration (mg/L)	Time of Max (Year)	Maximum Concentration (mg/L)	Time of Max (Year)	
Category 1/2 and Overburden Stockpile					
Arsenic					
No Sorption	0.0060	66	0.14	174-2000	0.14
With Sorption	0.0028	1-66	0.0028	67-2000	0.0028
Antimony					
No Sorption	0.0015	1-29	0.016	167-2000	0.016
With Sorption	0.0015	1-66	0.0015	67-2000	0.0015
Sulfate					
No Sorption	45	66	240	247-2000	240
West Pit					
Arsenic					
No Sorption	---	---	0.046	453-2000	0.046
With Sorption	---	---	0.0028	67-102	0.0021
Antimony					
No Sorption	---	---	0.045	436-2000	0.045
With Sorption	---	---	0.0015	67-2000	0.0015
Sulfate					
No Sorption	---	---	80	463-2000	80
East Pit and Category 4 Stockpile					
Iron					
No Sorption	0.27	1-6	0.32	127-167	0.31
Manganese					
No Sorption	0.041	1-20, 39-66	0.089	123-132	0.058
Nickel					
No Sorption	0.011	53-60	0.018	119-135	0.0059
With Sorption	0.0010	1-66	0.0011	1967-2000	0.0011
Antimony					
No Sorption	0.0016	66	0.015	119-135	0.0048
With Sorption	0.0015	1-66	0.0015	67-2000	0.0015
Sulfate					
No Sorption	14	1-66	68	123-132	34

Table 6-31. Summary of maximum concentration data predicted using the transient groundwater quality models for Mine Site Proposed Action with average liner leakage (Page 2 of 2)

	Years 1-66		Years 67-2000		Final Concentration (mg/L)
	Maximum Concentration	Time of Max	Maximum Concentration	Time of Max	
	(mg/L)	(Year)	(mg/L)	(Year)	
Category 3 Stockpile					
Arsenic					
No Sorption	0.0036	64-66	0.041	144	0.017
With Sorption	0.0021	1-66	0.0021	67-2000	0.0021
Copper					
No Sorption	0.37	66	0.65	141-148	0.63
With Sorption	0.0068	1-66	0.023	1979-2000	0.023
Iron					
No Sorption	0.54	66	1.3	178-2000	1.3
Manganese					
No Sorption	0.12	62-66	0.30	136-156	0.24
Nickel					
No Sorption	1.2	64-66	2.3	128-186	2.2
With Sorption	0.0010	1-66	0.18	1983-2000	0.18
Antimony					
No Sorption	0.0017	60-66	0.035	140-148	0.014
With Sorption	0.0015	1-66	0.0016	1101-2000	0.0016
Sulfate					
No Sorption	31	64-66	180	140-153	110
Category 3 Lean Ore Stockpile					
Copper					
No Sorption	0.039	57-63	0.038	67-2000	0.038
With Sorption	0.0068	1-66	0.0080	1980-2000	0.0080
Iron					
No Sorption	0.24	54-66	0.24	67-2000	0.24
Manganese					
No Sorption	0.046	45-66	0.046	67-2000	0.046
Nickel					
No Sorption	0.12	52-66	0.12	67-2000	0.12
With Sorption	0.0010	1-66	0.023	1980-2000	0.023
Sulfate					
No Sorption	15	35-66	15	67-2000	15
Lean Ore Surge Pile					
Iron					
No Sorption	0.22	54-66	0.22	67-70	0.20
Manganese					
No Sorption	0.040	49-66	0.040	67-82	0.039
Nickel					
No Sorption	0.0070	63-66	0.0068	67	0.0010
With Sorption	0.0010	1-66	0.0010	67-2000	0.0010
Sulfate					
No Sorption	14	1-66	14	67-2000	14

Table 6-32. Summary of maximum concentration data predicted using the transient groundwater quality models for Mine Site Proposed Action with high liner leakage (Page 1 of 2)

	Years 1-60		Years 61-2000		Final Concentration (mg/L)
	Maximum Concentration (mg/L)	Time of Max (Year)	Maximum Concentration (mg/L)	Time of Max (Year)	
Category 1/2 and Overburden Stockpile					
Arsenic					
No Sorption	0.0035	60	0.14	178-2000	0.14
With Sorption	0.0028	1-60	0.0028	61-2000	0.0028
Antimony					
No Sorption	0.0015	1-29	0.016	167-2000	0.016
With Sorption	0.0015	1-60	0.0015	61-2000	0.0015
Sulfate					
No Sorption	41	60	180	219-2000	180
West Pit					
Arsenic					
No Sorption	---	---	0.082	455-2000	0.082
With Sorption	---	---	0.0028	61-96	0.0021
Antimony					
No Sorption	---	---	0.045	430-2000	0.045
With Sorption	---	---	0.0015	61-2000	0.0015
Sulfate					
No Sorption	---	---	96	529-2000	96
East Pit and Category 4 Stockpile					
Iron					
No Sorption	0.50	51-56	0.47	61	0.40
Manganese					
No Sorption	0.075	54-59	0.11	122-131	0.082
Nickel					
No Sorption	0.25	58-60	0.29	113-2000	0.29
With Sorption	0.0010	1-60	0.0037	1999-2000	0.0037
Antimony					
No Sorption	0.0016	42-60	0.015	119-129	0.0054
With Sorption	0.0015	1-60	0.0015	61-2000	0.0015
Sulfate					
No Sorption	24	50-59	67	121-129	31

Table 6-32. Summary of maximum concentration data predicted using the transient groundwater quality models for Mine Site Proposed Action with high liner leakage (Page 2 of 2)

	Years 1-60		Years 61-2000		Final Concentration (mg/L)
	Maximum Concentration	Time of Max	Maximum Concentration	Time of Max	
	(mg/L)	(Year)	(mg/L)	(Year)	
Category 3 Stockpile					
Arsenic					
No Sorption	0.0092	60	0.046	140-142	0.025
With Sorption	0.0021	1-60	0.0023	1844-2000	0.0023
Copper					
No Sorption	1.6	59-60	3.2	119-2000	3.2
With Sorption	0.0068	1-60	0.10	1948-2000	0.10
Iron					
No Sorption	1.6	58-60	4.2	148-2000	4.2
Manganese					
No Sorption	0.42	59-60	0.90	138-153	0.86
Nickel					
No Sorption	5.1	60	12	122-2000	12
With Sorption	0.0010	1-60	1.0	1956-2000	1.0
Antimony					
No Sorption	0.0023	58-60	0.033	135-148	0.016
With Sorption	0.0015	1-60	0.0015	61-2000	0.0015
Sulfate					
No Sorption	97	60	280	133-148	210
Category 3 Lean Ore Stockpile					
Copper					
No Sorption	0.92	56-60	0.92	61-74	0.91
With Sorption	0.0068	1-60	0.043	2000	0.043
Iron					
No Sorption	1.2	60	1.3	83-2000	1.3
Manganese					
No Sorption	0.25	51-60	0.25	61-2000	0.25
Nickel					
No Sorption	3.3	57-60	3.4	62-2000	3.4
With Sorption	0.0010	0-60	0.65	2000	0.65
Sulfate					
No Sorption	58	55-60	58	61	56
Lean Ore Surge Pile					
Iron					
No Sorption	0.47	60	0.47	61	0.20
Manganese					
No Sorption	0.065	59-60	0.066	61-64	0.039
Nickel					
No Sorption	0.14	58-60	0.15	63	0.0010
With Sorption	0.0010	1-60	0.0010	61-2000	0.0010
Sulfate					
No Sorption	23	56-60	23	61-66	14

Table 7-1. Deterministic Water Quality Predictions at surface water monitoring station SW-001 (mg/L)

Partridge River SW-001

Low Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001
Al	0.0169	0.0337	0.0337	0.0337	0.0337	0.0337	0.0337	0.0337	0.0337	0.125
As	0.0065	0.0058	0.0058	0.0058	0.0058	0.0058	0.0058	0.0058	0.0058	0.053
B	0.0960	0.0946	0.0946	0.0946	0.0946	0.0946	0.0946	0.0946	0.0946	0.5
Ba	0.0050	0.0076	0.0076	0.0076	0.0076	0.0076	0.0076	0.0076	0.0076	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	24.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	
Cl	1.6	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	230
Co	0.0005	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.005
Cu	0.0012	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	
Cu-Std	0.0101	0.0096	0.0096	0.0096	0.0096	0.0096	0.0096	0.0096	0.0096	
F	0.1400	0.1614	0.1614	0.1614	0.1614	0.1614	0.1614	0.1614	0.1614	
Fe	0.0300	0.4593	0.4593	0.4593	0.4593	0.4593	0.4593	0.4593	0.4593	
Hardness	110.0	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	
K	2.7	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	
Mg	10.5	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	
Mn	0.0086	0.0262	0.0262	0.0262	0.0262	0.0262	0.0262	0.0262	0.0262	
Na	4.8	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	
Ni	0.0005	0.0038	0.0038	0.0038	0.0038	0.0038	0.0038	0.0038	0.0038	
Ni-Std	0.0565	0.0536	0.0536	0.0536	0.0536	0.0536	0.0536	0.0536	0.0536	
Pb	0.0002	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	
Pb-Std	0.0036	0.0033	0.0033	0.0033	0.0033	0.0033	0.0033	0.0033	0.0033	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.031
Se	0.0005	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.005
SO ₄	22.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	
Tl	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.00056
V	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	
Zn	0.0073	0.0104	0.0104	0.0104	0.0104	0.0104	0.0104	0.0104	0.0104	
Zn-Std	0.1149	0.1090	0.1090	0.1090	0.1090	0.1090	0.1090	0.1090	0.1090	

Notes

- 1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.
- 2) Deterministic Water Quality Predictions at SW-001 does not change during mine operation and closure because it is upstream of the mine.

Table 7-2. Deterministic Water Quality Predictions at surface water monitoring station SW-001 (mg/L)

Partridge River SW-001

Average Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0169	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.125
As	0.0065	0.0029	0.0029	0.0029	0.0029	0.0029	0.0029	0.0029	0.0029	0.053
B	0.0960	0.0553	0.0553	0.0553	0.0553	0.0553	0.0553	0.0553	0.0553	0.5
Ba	0.0050	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	24.5	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	
Cl	1.6	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	230
Co	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.005
Cu	0.0012	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	
Cu-Std	0.0101	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	
F	0.1400	0.0889	0.0889	0.0889	0.0889	0.0889	0.0889	0.0889	0.0889	
Fe	0.0300	1.3639	1.3639	1.3639	1.3639	1.3639	1.3639	1.3639	1.3639	
Hardness	110.0	108.6	108.6	108.6	108.6	108.6	108.6	108.6	108.6	
K	2.7	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	
Mg	10.5	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	
Mn	0.0086	0.1244	0.1244	0.1244	0.1244	0.1244	0.1244	0.1244	0.1244	
Na	4.8	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	
Ni	0.0005	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	
Ni-Std	0.0565	0.0559	0.0559	0.0559	0.0559	0.0559	0.0559	0.0559	0.0559	
Pb	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	
Pb-Std	0.0036	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.031
Se	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.005
SO ₄	22.1	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	
Ti	0.0003	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0043	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	
Zn	0.0073	0.0148	0.0148	0.0148	0.0148	0.0148	0.0148	0.0148	0.0148	
Zn-Std	0.1149	0.1137	0.1137	0.1137	0.1137	0.1137	0.1137	0.1137	0.1137	

Notes

- 1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.
- 2) Deterministic Water Quality Predictions at SW-001 does not change during mine operation and closure because it is upstream of the mine.

Table 7-3. Deterministic Water Quality Predictions at surface water monitoring station SW-001 (mg/L)

Partridge River SW-001

High Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0169	0.0695	0.0695	0.0695	0.0695	0.0695	0.0695	0.0695	0.0695	0.125
As	0.0065	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.053
B	0.0960	0.0457	0.0457	0.0457	0.0457	0.0457	0.0457	0.0457	0.0457	0.5
Ba	0.0050	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	24.5	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	
Cl	1.6	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	230
Co	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.005
Cu	0.0012	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	
Cu-Std	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	
F	0.1400	0.0713	0.0713	0.0713	0.0713	0.0713	0.0713	0.0713	0.0713	
Fe	0.0300	1.5842	1.5842	1.5842	1.5842	1.5842	1.5842	1.5842	1.5842	
Hardness	110.0	109.9	109.9	109.9	109.9	109.9	109.9	109.9	109.9	
K	2.7	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	
Mg	10.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
Mn	0.0086	0.1483	0.1483	0.1483	0.1483	0.1483	0.1483	0.1483	0.1483	
Na	4.8	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Ni	0.0005	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	
Ni-Std	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	
Pb	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	
Pb-Std	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.031
Se	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.005
SO ₄	22.1	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	
Ti	0.0003	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0043	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	
Zn	0.0073	0.0159	0.0159	0.0159	0.0159	0.0159	0.0159	0.0159	0.0159	
Zn-Std	0.1149	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	

Notes

- 1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.
- 2) Deterministic Water Quality Predictions at SW-001 does not change during mine operation and closure because it is upstream of the mine.

Table 7-4. Deterministic Water Quality Predictions at surface water monitoring station SW-002 (mg/L)

Partridge River SW-002

Low Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.001
Al	0.0459	0.0550	0.0540	0.0527	0.0526	0.0523	0.0501	0.0501	0.0506	0.125
As	0.0010	0.0050	0.0050	0.0051	0.0051	0.0051	0.0052	0.0052	0.0052	0.053
B	0.0585	0.0928	0.0929	0.0930	0.0931	0.0931	0.0933	0.0933	0.0932	0.5
Ba	0.0096	0.0109	0.0108	0.0106	0.0105	0.0105	0.0102	0.0102	0.0102	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	24.5	21.1	21.2	21.3	21.3	21.3	21.5	21.5	21.5	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0012	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	
Cl	1.8	3.4	3.3	3.2	3.2	3.2	3.1	3.1	3.1	230
Co	0.0005	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.005
Cu	0.0005	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	
Cu-Std	0.0103	0.0089	0.0089	0.0090	0.0090	0.0090	0.0091	0.0091	0.0091	
F	0.1100	0.1891	0.1877	0.1860	0.1858	0.1856	0.1826	0.1826	0.1833	
Fe	1.2200	1.0160	0.9891	0.9546	0.9510	0.9456	0.8868	0.8868	0.9000	
Hardness	112.0	94.7	95.1	95.7	95.7	95.8	96.7	96.7	96.5	
K	2.0	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	
Mg	7.5	9.6	9.7	9.7	9.7	9.7	9.7	9.7	9.7	
Mn	0.1420	0.0490	0.0479	0.0465	0.0464	0.0461	0.0437	0.0437	0.0443	
Na	3.2	7.8	7.7	7.6	7.6	7.6	7.4	7.4	7.4	
Ni	0.0008	0.0067	0.0066	0.0064	0.0064	0.0063	0.0060	0.0060	0.0061	
Ni-Std	0.0574	0.0498	0.0500	0.0503	0.0503	0.0503	0.0507	0.0507	0.0506	
Pb	0.0003	0.0005	0.0005	0.0005	0.0005	0.0005	0.0004	0.0004	0.0004	
Pb-Std	0.0037	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.031
Se	0.0005	0.0010	0.0010	0.0010	0.0010	0.0010	0.0009	0.0009	0.0009	0.005
SO ₄	6.3	19.9	20.0	20.1	20.1	20.1	20.2	20.2	20.2	
Ti	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.00056
V	0.0009	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	
Zn	0.0101	0.0144	0.0142	0.0140	0.0139	0.0139	0.0135	0.0135	0.0136	
Zn-Std	0.1167	0.1012	0.1016	0.1021	0.1022	0.1022	0.1031	0.1031	0.1029	

Notes

- 1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 7-5. Deterministic Water Quality Predictions at surface water monitoring station SW-002 (mg/L)

Partridge River SW-002

Average Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0459	0.0680	0.0679	0.0677	0.0677	0.0677	0.0675	0.0674	0.0675	0.125
As	0.0010	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.053
B	0.0585	0.0515	0.0514	0.0513	0.0513	0.0513	0.0512	0.0513	0.0511	0.5
Ba	0.0096	0.0081	0.0081	0.0081	0.0081	0.0081	0.0080	0.0080	0.0080	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	24.5	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	
Cl	1.8	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	230
Co	0.0005	0.0006	0.0006	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.005
Cu	0.0005	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	
Cu-Std	0.0103	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	
F	0.1100	0.0861	0.0858	0.0853	0.0853	0.0852	0.0844	0.0846	0.0844	
Fe	1.2200	1.5208	1.5181	1.5147	1.5144	1.5140	1.5091	1.5076	1.5110	
Hardness	112.0	107.9	108.0	108.1	108.1	108.1	108.3	108.3	108.3	
K	2.0	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
Mg	7.5	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	
Mn	0.1420	0.1363	0.1363	0.1363	0.1363	0.1363	0.1364	0.1362	0.1366	
Na	3.2	3.2	3.2	3.2	3.2	3.2	3.1	3.1	3.1	
Ni	0.0008	0.0023	0.0022	0.0022	0.0022	0.0022	0.0021	0.0021	0.0021	
Ni-Std	0.0574	0.0556	0.0557	0.0557	0.0557	0.0557	0.0558	0.0558	0.0558	
Pb	0.0003	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	
Pb-Std	0.0037	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.031
Se	0.0005	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.005
SO ₄	6.3	10.5	10.5	10.5	10.5	10.5	10.4	10.5	10.4	
Ti	0.0002	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0009	0.0014	0.0014	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	
Zn	0.0101	0.0158	0.0158	0.0157	0.0157	0.0157	0.0157	0.0157	0.0157	
Zn-Std	0.1167	0.1131	0.1132	0.1132	0.1133	0.1133	0.1134	0.1134	0.1134	

Notes

- 1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 7-6. Deterministic Water Quality Predictions at surface water monitoring station SW-002 (mg/L)

Partridge River SW-002

High Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0459	0.0699	0.0699	0.0699	0.0698	0.0698	0.0698	0.0698	0.0698	0.125
As	0.0010	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.053
B	0.0585	0.0454	0.0454	0.0454	0.0454	0.0454	0.0454	0.0454	0.0454	0.5
Ba	0.0096	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	24.5	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	
Cl	1.8	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	230
Co	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.005
Cu	0.0005	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	
Cu-Std	0.0103	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	
F	0.1100	0.0711	0.0710	0.0710	0.0710	0.0710	0.0709	0.0710	0.0709	
Fe	1.2200	1.5948	1.5946	1.5944	1.5944	1.5944	1.5941	1.5939	1.5942	
Hardness	112.0	109.9	109.9	109.9	109.9	109.9	109.9	109.9	109.9	
K	2.0	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	
Mg	7.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
Mn	0.1420	0.1491	0.1491	0.1491	0.1491	0.1491	0.1491	0.1491	0.1491	
Na	3.2	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Ni	0.0008	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	
Ni-Std	0.0574	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	
Pb	0.0003	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	
Pb-Std	0.0037	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.031
Se	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.005
SO ₄	6.3	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	
Ti	0.0002	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	
Zn	0.0101	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	
Zn-Std	0.1167	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	

Notes

- 1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 7-7. Deterministic Water Quality Predictions at surface water monitoring station SW-003 (mg/L)

Partridge River SW-003

Low Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.001
Al	0.0603	0.0596	0.0587	0.0575	0.0574	0.0573	0.0547	0.0554	0.0554	0.125
As	0.0010	0.0048	0.0048	0.0049	0.0049	0.0049	0.0050	0.0051	0.0051	0.053
B	0.0661	0.0925	0.0926	0.0927	0.0927	0.0927	0.0922	0.0952	0.0952	0.5
Ba	0.0100	0.0116	0.0115	0.0113	0.0113	0.0113	0.0109	0.0112	0.0113	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	20.7	20.7	20.8	20.9	20.9	20.9	21.0	22.2	22.1	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	
Cl	10.5	3.6	3.5	3.5	3.5	3.5	3.3	4.5	4.3	230
Co	0.0005	0.0010	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.005
Cu	0.0011	0.0019	0.0019	0.0019	0.0019	0.0019	0.0018	0.0019	0.0018	
Cu-Std	0.0094	0.0088	0.0088	0.0088	0.0088	0.0088	0.0089	0.0092	0.0092	
F	0.0900	0.1950	0.1938	0.1922	0.1921	0.1919	0.1877	0.1921	0.1929	
Fe	1.6300	1.1357	1.1107	1.0787	1.0768	1.0740	1.0089	1.0148	1.0260	
Hardness	101.1	92.9	93.3	93.8	93.8	93.9	94.1	98.5	97.8	
K	2.0	2.3	2.3	2.3	2.3	2.3	2.4	2.6	2.6	
Mg	9.0	9.5	9.5	9.6	9.6	9.6	9.6	9.9	9.8	
Mn	0.1920	0.0539	0.0529	0.0516	0.0515	0.0514	0.0487	0.0493	0.0494	
Na	3.8	8.2	8.1	8.0	8.0	8.0	7.7	16.0	15.7	
Ni	0.0016	0.0073	0.0072	0.0071	0.0070	0.0070	0.0067	0.0067	0.0068	
Ni-Std	0.0526	0.0490	0.0492	0.0494	0.0494	0.0494	0.0495	0.0515	0.0512	
Pb	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.0006	
Pb-Std	0.0032	0.0029	0.0029	0.0029	0.0029	0.0029	0.0029	0.0031	0.0031	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0016	0.0016	0.031
Se	0.0005	0.0011	0.0010	0.0010	0.0010	0.0010	0.0010	0.0013	0.0012	0.005
SO ₄	10.9	19.7	19.8	19.9	19.9	19.9	19.8	22.2	22.2	
Ti	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.00056
V	0.0009	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	0.0047	0.0047	
Zn	0.0064	0.0153	0.0151	0.0148	0.0148	0.0148	0.0143	0.0162	0.0146	
Zn-Std	0.1070	0.0996	0.0999	0.1004	0.1004	0.1005	0.1007	0.1046	0.1040	

Notes

- 1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 7-8. Deterministic Water Quality Predictions at surface water monitoring station SW-003 (mg/L)

Partridge River SW-003

Average Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0603	0.0687	0.0686	0.0685	0.0685	0.0684	0.0682	0.0682	0.0683	0.125
As	0.0010	0.0024	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.053
B	0.0661	0.0510	0.0509	0.0509	0.0509	0.0509	0.0507	0.0511	0.0509	0.5
Ba	0.0100	0.0082	0.0082	0.0081	0.0081	0.0081	0.0081	0.0081	0.0081	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	20.7	17.5	17.5	17.5	17.5	17.5	17.5	17.6	17.6	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0011	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	
Cl	10.5	7.4	7.4	7.4	7.4	7.4	7.4	7.6	7.5	230
Co	0.0005	0.0006	0.0006	0.0006	0.0006	0.0006	0.0005	0.0005	0.0005	0.005
Cu	0.0011	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	
Cu-Std	0.0094	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	
F	0.0900	0.0857	0.0854	0.0851	0.0850	0.0850	0.0841	0.0849	0.0846	
Fe	1.6300	1.5415	1.5389	1.5357	1.5355	1.5353	1.5292	1.5285	1.5321	
Hardness	101.1	107.8	107.9	108.0	108.0	108.0	108.1	108.6	108.5	
K	2.0	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.4	
Mg	9.0	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	
Mn	0.1920	0.1379	0.1379	0.1379	0.1379	0.1379	0.1379	0.1377	0.1381	
Na	3.8	3.2	3.2	3.2	3.2	3.2	3.1	4.2	3.9	
Ni	0.0016	0.0023	0.0023	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	
Ni-Std	0.0526	0.0556	0.0556	0.0557	0.0557	0.0557	0.0557	0.0559	0.0559	
Pb	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	
Pb-Std	0.0032	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.031
Se	0.0005	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.005
SO ₄	10.9	10.3	10.3	10.3	10.3	10.3	10.3	10.6	10.5	
Ti	0.0002	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0009	0.0013	0.0013	0.0013	0.0013	0.0013	0.0013	0.0014	0.0013	
Zn	0.0064	0.0159	0.0159	0.0159	0.0159	0.0159	0.0158	0.0160	0.0158	
Zn-Std	0.1070	0.1130	0.1131	0.1131	0.1132	0.1132	0.1132	0.1137	0.1136	

Notes

- 1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 7-9. Deterministic Water Quality Predictions at surface water monitoring station SW-003 (mg/L)

Partridge River SW-003

High Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0603	0.0699	0.0699	0.0699	0.0699	0.0699	0.0699	0.0699	0.0699	0.125
As	0.0010	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.053
B	0.0661	0.0453	0.0453	0.0453	0.0453	0.0453	0.0453	0.0453	0.0453	0.5
Ba	0.0100	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	20.7	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0011	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	
Cl	10.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	230
Co	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.005
Cu	0.0011	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	
Cu-Std	0.0094	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	
F	0.0900	0.0709	0.0709	0.0709	0.0709	0.0709	0.0708	0.0708	0.0708	
Fe	1.6300	1.5967	1.5965	1.5963	1.5963	1.5963	1.5960	1.5960	1.5962	
Hardness	101.1	109.9	109.9	109.9	109.9	109.9	109.9	109.9	109.9	
K	2.0	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	
Mg	9.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
Mn	0.1920	0.1493	0.1493	0.1493	0.1493	0.1493	0.1493	0.1493	0.1493	
Na	3.8	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.6	
Ni	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	
Ni-Std	0.0526	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	
Pb	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	
Pb-Std	0.0032	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.031
Se	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.005
SO ₄	10.9	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	
Ti	0.0002	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	
Zn	0.0064	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	
Zn-Std	0.1070	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	

Notes

- 1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 7-10. Deterministic Water Quality Predictions at surface water monitoring station SW-004 (mg/L)

Partridge River SW-004

Low Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.001
Al	0.0713	0.0861	0.0856	0.0851	0.0851	0.0850	0.0828	0.0671	0.0657	0.125
As	0.0010	0.0042	0.0043	0.0043	0.0043	0.0043	0.0043	0.0047	0.0064	0.053
B	0.0611	0.0902	0.0903	0.0903	0.0903	0.0903	0.0894	0.0958	0.0999	0.5
Ba	0.0050	0.0135	0.0134	0.0132	0.0132	0.0132	0.0128	0.0132	0.0148	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	20.7	19.2	19.3	19.4	19.4	19.4	19.3	21.8	23.5	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0011	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0011	0.0011	
Cl	9.1	4.1	4.1	4.0	4.0	4.0	3.9	5.7	5.9	230
Co	0.0005	0.0011	0.0011	0.0011	0.0011	0.0011	0.0010	0.0010	0.0011	0.005
Cu	0.0021	0.0030	0.0030	0.0030	0.0030	0.0030	0.0030	0.0021	0.0021	
Cu-Std	0.0088	0.0082	0.0083	0.0083	0.0083	0.0083	0.0083	0.0090	0.0094	
F	0.0900	0.2096	0.2086	0.2073	0.2073	0.2073	0.2027	0.2089	0.2140	
Fe	1.3400	1.3611	1.3386	1.3122	1.3121	1.3118	1.2499	1.3116	1.2949	
Hardness	92.9	86.5	86.8	87.2	87.2	87.2	86.8	96.4	100.9	
K	1.6	2.2	2.2	2.3	2.3	2.3	2.2	2.6	2.9	
Mg	8.3	9.1	9.1	9.1	9.1	9.1	9.0	9.8	9.9	
Mn	0.1290	0.0698	0.0690	0.0681	0.0681	0.0681	0.0656	0.0616	0.0604	
Na	3.5	8.8	8.7	8.7	8.7	8.7	8.4	22.3	28.1	
Ni	0.0019	0.0088	0.0088	0.0088	0.0091	0.0090	0.0085	0.0083	0.0094	
Ni-Std	0.0490	0.0461	0.0463	0.0465	0.0465	0.0465	0.0463	0.0506	0.0526	
Pb	0.0002	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0007	0.0009	
Pb-Std	0.0029	0.0026	0.0027	0.0027	0.0027	0.0027	0.0027	0.0030	0.0032	
Sb	0.0015	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0016	0.0039	0.031
Se	0.0005	0.0012	0.0011	0.0011	0.0011	0.0011	0.0011	0.0016	0.0017	0.005
SO ₄	10.0	19.9	20.0	20.1	20.1	20.1	19.9	23.1	28.2	
Ti	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.00056
V	0.0009	0.0042	0.0042	0.0042	0.0042	0.0042	0.0041	0.0049	0.0060	
Zn	0.0192	0.0167	0.0166	0.0164	0.0164	0.0164	0.0159	0.0195	0.0173	
Zn-Std	0.0996	0.0937	0.0940	0.0944	0.0944	0.0944	0.0940	0.1027	0.1068	

Notes

- 1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 7-11. Deterministic Water Quality Predictions at surface water monitoring station SW-004 (mg/L)

Partridge River SW-004

Average Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0713	0.0717	0.0717	0.0716	0.0716	0.0716	0.0713	0.0697	0.0696	0.125
As	0.0010	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0024	0.0025	0.053
B	0.0611	0.0498	0.0498	0.0497	0.0498	0.0498	0.0496	0.0499	0.0504	0.5
Ba	0.0050	0.0083	0.0083	0.0083	0.0083	0.0083	0.0082	0.0082	0.0084	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	20.7	17.2	17.2	17.3	17.3	17.3	17.2	17.5	17.6	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0011	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	
Cl	9.1	7.6	7.6	7.6	7.6	7.6	7.6	7.8	7.8	230
Co	0.0005	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.005
Cu	0.0021	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0017	0.0017	
Cu-Std	0.0088	0.0099	0.0099	0.0099	0.0099	0.0099	0.0099	0.0100	0.0101	
F	0.0900	0.0848	0.0846	0.0844	0.0844	0.0844	0.0836	0.0836	0.0841	
Fe	1.3400	1.5746	1.5724	1.5699	1.5699	1.5698	1.5640	1.5715	1.5707	
Hardness	92.9	107.5	107.6	107.6	107.6	107.6	107.6	108.7	109.1	
K	1.6	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.5	
Mg	8.3	8.1	8.1	8.1	8.1	8.1	8.1	8.2	8.2	
Mn	0.1290	0.1415	0.1414	0.1414	0.1414	0.1414	0.1413	0.1413	0.1413	
Na	3.5	3.2	3.2	3.1	3.1	3.1	3.1	4.5	5.0	
Ni	0.0019	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0022	0.0023	
Ni-Std	0.0490	0.0555	0.0555	0.0555	0.0555	0.0555	0.0555	0.0560	0.0562	
Pb	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	
Pb-Std	0.0029	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	0.0036	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0017	0.031
Se	0.0005	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.005
SO ₄	10.0	10.2	10.2	10.2	10.2	10.2	10.1	10.4	10.7	
Ti	0.0002	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0009	0.0012	0.0012	0.0012	0.0013	0.0012	0.0012	0.0013	0.0014	
Zn	0.0192	0.0161	0.0161	0.0160	0.0160	0.0160	0.0160	0.0164	0.0161	
Zn-Std	0.0996	0.1127	0.1127	0.1128	0.1128	0.1128	0.1128	0.1138	0.1142	

Notes

- 1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 7-12. Deterministic Water Quality Predictions at surface water monitoring station SW-004 (mg/L)

Partridge River SW-004

High Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0713	0.0701	0.0701	0.0701	0.0702	0.0702	0.0702	0.0700	0.0700	0.125
As	0.0010	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0022	0.053
B	0.0611	0.0453	0.0453	0.0453	0.0453	0.0453	0.0453	0.0453	0.0454	0.5
Ba	0.0050	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	20.7	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0011	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	
Cl	9.1	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	230
Co	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.005
Cu	0.0021	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	
Cu-Std	0.0088	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	
F	0.0900	0.0710	0.0710	0.0710	0.0710	0.0710	0.0709	0.0709	0.0709	
Fe	1.3400	1.5983	1.5983	1.5981	1.5981	1.5981	1.5978	1.5981	1.5981	
Hardness	92.9	109.8	109.8	109.8	109.8	109.8	109.8	109.9	109.9	
K	1.6	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	
Mg	8.3	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
Mn	0.1290	0.1494	0.1494	0.1494	0.1494	0.1494	0.1494	0.1494	0.1494	
Na	3.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.6	
Ni	0.0019	0.0016	0.0016	0.0016	0.0017	0.0017	0.0017	0.0016	0.0016	
Ni-Std	0.0490	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	
Pb	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	
Pb-Std	0.0029	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.031
Se	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.005
SO ₄	10.0	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	
Ti	0.0002	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	
Zn	0.0192	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	
Zn-Std	0.0996	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	0.1149	

Notes

- 1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 7-13. Deterministic Water Quality Predictions at surface water monitoring station SW-004a (mg/L)

Partridge River SW-004a

Low Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.001
Al	0.1051	0.1056	0.1052	0.1050	0.1048	0.1036	0.0954	0.0923	0.125
As	0.0034	0.0034	0.0039	0.0044	0.0043	0.0043	0.0045	0.0076	0.053
B	0.0884	0.0879	0.0897	0.0896	0.0895	0.0889	0.0926	0.0999	0.5
Ba	0.0169	0.0168	0.0171	0.0171	0.0171	0.0168	0.0172	0.0197	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	
Ca	17.4	17.5	18.6	18.5	18.4	18.4	19.8	22.9	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0009	0.0009	0.0010	0.0010	0.0010	0.0010	0.0010	0.0011	
Cl	5.1	5.1	5.3	5.3	5.2	5.0	6.0	6.8	230
Co	0.0013	0.0013	0.0014	0.0014	0.0014	0.0014	0.0014	0.0016	0.005
Cu	0.0032	0.0034	0.0033	0.0033	0.0033	0.0033	0.0028	0.0029	
Cu-Std	0.0075	0.0076	0.0079	0.0079	0.0078	0.0078	0.0082	0.0090	
F	0.2388	0.2402	0.2391	0.2391	0.2392	0.2368	0.2413	0.2479	
Fe	1.9303	1.9033	1.9128	1.9132	1.9135	1.8830	1.9362	1.8720	
Hardness	78.0	78.4	82.0	81.8	81.6	81.3	86.5	95.9	
K	2.1	2.1	2.2	2.2	2.2	2.2	2.4	2.9	
Mg	8.6	8.6	8.8	8.8	8.8	8.8	9.2	9.6	
Mn	0.0925	0.0924	0.0923	0.0926	0.0925	0.0913	0.0898	0.0867	
Na	10.5	10.5	11.3	11.8	11.7	11.6	19.6	30.3	
Ni	0.0118	0.0119	0.0124	0.0130	0.0129	0.0127	0.0127	0.0144	
Ni-Std	0.0423	0.0424	0.0441	0.0440	0.0439	0.0438	0.0462	0.0504	
Pb	0.0008	0.0008	0.0009	0.0009	0.0009	0.0009	0.0010	0.0012	
Pb-Std	0.0023	0.0023	0.0025	0.0025	0.0025	0.0024	0.0026	0.0030	
Sb	0.0014	0.0015	0.0016	0.0016	0.0016	0.0016	0.0017	0.0056	0.031
Se	0.0015	0.0015	0.0015	0.0015	0.0015	0.0014	0.0018	0.0020	0.005
SO ₄	18.8	19.4	21.1	22.7	22.4	22.4	24.3	33.1	
Tl	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00056
V	0.0042	0.0042	0.0045	0.0048	0.0047	0.0047	0.0051	0.0070	
Zn	0.0208	0.0206	0.0209	0.0208	0.0208	0.0206	0.0227	0.0219	
Zn-Std	0.0859	0.0862	0.0896	0.0894	0.0892	0.0890	0.0938	0.1023	

Notes

1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 7-14. Deterministic Water Quality Predictions at surface water monitoring station SW-004a (mg/L)

Partridge River SW-004a

Average Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.001
Al	0.0728	0.0728	0.0728	0.0729	0.0729	0.0727	0.0720	0.0693	0.125
As	0.0022	0.0022	0.0022	0.0023	0.0023	0.0023	0.0023	0.0070	0.053
B	0.0484	0.0484	0.0485	0.0485	0.0485	0.0484	0.0486	0.0631	0.5
Ba	0.0084	0.0084	0.0084	0.0084	0.0084	0.0084	0.0084	0.0122	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	17.0	17.0	17.1	17.1	17.1	17.1	17.2	22.4	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0013	
Cl	7.8	7.8	7.8	7.8	7.8	7.8	7.9	9.9	230
Co	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0008	0.005
Cu	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0020	
Cu-Std	0.0099	0.0099	0.0100	0.0100	0.0099	0.0100	0.0100	0.0112	
F	0.0833	0.0836	0.0834	0.0834	0.0835	0.0831	0.0832	0.1015	
Fe	1.6258	1.6238	1.6240	1.6240	1.6241	1.6214	1.6248	1.5472	
Hardness	107.5	107.5	107.8	107.8	107.8	107.8	108.3	123.5	
K	1.4	1.4	1.4	1.4	1.4	1.4	1.4	2.4	
Mg	8.0	8.1	8.1	8.1	8.1	8.1	8.1	9.0	
Mn	0.1455	0.1454	0.1454	0.1455	0.1454	0.1454	0.1454	0.1386	
Na	3.1	3.1	3.2	3.2	3.2	3.2	3.8	26.0	
Ni	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0044	
Ni-Std	0.0554	0.0554	0.0556	0.0556	0.0556	0.0556	0.0558	0.0624	
Pb	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0009	
Pb-Std	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	0.0042	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0063	0.031
Se	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0013	0.005
SO ₄	9.8	9.8	9.9	10.0	10.0	10.0	10.1	20.7	
Tl	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0043	
Zn	0.0164	0.0164	0.0164	0.0164	0.0164	0.0164	0.0165	0.0180	
Zn-Std	0.1127	0.1127	0.1130	0.1130	0.1130	0.1130	0.1134	0.1267	

Notes

1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 7-15. Deterministic Water Quality Predictions at surface water monitoring station SW-004a (mg/L)

Partridge River SW-004a

High Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0701	0.0702	0.0702	0.0702	0.0702	0.0702	0.0701	0.0694	0.125
As	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0047	0.053
B	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0496	0.5
Ba	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0089	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	17.0	17.0	17.0	17.0	17.0	17.0	17.0	18.5	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0013	
Cl	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.3	230
Co	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.005
Cu	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0018	
Cu-Std	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0104	
F	0.0707	0.0707	0.0707	0.0707	0.0707	0.0707	0.0707	0.0745	
Fe	1.6011	1.6009	1.6010	1.6010	1.6010	1.6009	1.6010	1.5797	
Hardness	109.9	109.9	109.9	109.9	109.9	109.9	109.9	114.1	
K	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.6	
Mg	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.3	
Mn	0.1498	0.1498	0.1498	0.1498	0.1498	0.1498	0.1498	0.1478	
Na	2.5	2.5	2.5	2.5	2.5	2.5	2.6	6.9	
Ni	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0023	
Ni-Std	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	0.0583	
Pb	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	
Pb-Std	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0038	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0028	0.031
Se	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.005
SO ₄	9.0	9.1	9.1	9.1	9.1	9.1	9.1	12.2	
Tl	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0020	
Zn	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0165	
Zn-Std	0.1148	0.1148	0.1148	0.1149	0.1148	0.1148	0.1149	0.1186	

Notes

1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 7-16. Deterministic Water Quality Predictions at surface water monitoring station SW-005 (mg/L)

Partridge River SW-005

Low Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.001
Al	0.1162	0.1129	0.1132	0.1131	0.1130	0.1128	0.1122	0.1074	0.1052	0.125
As	0.0010	0.0029	0.0029	0.0032	0.0035	0.0034	0.0034	0.0035	0.0054	0.053
B	0.0372	0.0878	0.0876	0.0886	0.0886	0.0885	0.0882	0.0903	0.0948	0.5
Ba	0.0088	0.0189	0.0188	0.0190	0.0190	0.0190	0.0189	0.0191	0.0206	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	
Ca	18.6	16.4	16.4	17.1	17.0	17.0	16.9	17.7	19.7	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0010	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0010	
Cl	6.2	5.7	5.7	5.8	5.8	5.8	5.6	6.3	6.7	230
Co	0.0006	0.0014	0.0014	0.0015	0.0015	0.0015	0.0015	0.0015	0.0016	0.005
Cu	0.0017	0.0031	0.0032	0.0032	0.0032	0.0032	0.0032	0.0029	0.0029	
Cu-Std	0.0079	0.0072	0.0072	0.0074	0.0074	0.0073	0.0073	0.0076	0.0081	
F	0.0900	0.2550	0.2558	0.2554	0.2554	0.2554	0.2541	0.2571	0.2606	
Fe	1.9900	2.2890	2.2725	2.2833	2.2834	2.2836	2.2681	2.3062	2.2577	
Hardness	82.9	73.5	73.7	75.8	75.7	75.5	75.3	78.3	84.2	
K	1.0	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.4	
Mg	7.5	8.4	8.4	8.5	8.5	8.5	8.5	8.7	9.0	
Mn	0.1990	0.1048	0.1048	0.1049	0.1051	0.1050	0.1044	0.1037	0.1015	
Na	2.9	11.6	11.6	12.1	12.4	12.4	12.3	17.0	23.5	
Ni	0.0021	0.0136	0.0136	0.0140	0.0143	0.0143	0.0141	0.0141	0.0151	
Ni-Std	0.0445	0.0402	0.0403	0.0413	0.0412	0.0411	0.0411	0.0424	0.0451	
Pb	0.0008	0.0009	0.0009	0.0010	0.0010	0.0010	0.0010	0.0010	0.0012	
Pb-Std	0.0025	0.0021	0.0022	0.0022	0.0022	0.0022	0.0022	0.0023	0.0026	
Sb	0.0015	0.0015	0.0015	0.0016	0.0016	0.0016	0.0016	0.0016	0.0040	0.031
Se	0.0005	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0018	0.0020	0.005
SO ₄	9.0	17.8	18.1	19.1	20.1	19.9	19.9	20.9	26.3	
Ti	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00056
V	0.0009	0.0042	0.0042	0.0044	0.0046	0.0046	0.0045	0.0048	0.0059	
Zn	0.0167	0.0234	0.0233	0.0235	0.0235	0.0235	0.0233	0.0247	0.0241	
Zn-Std	0.0904	0.0816	0.0818	0.0838	0.0837	0.0836	0.0834	0.0862	0.0917	

Notes

- 1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 7-17. Deterministic Water Quality Predictions at surface water monitoring station SW-005 (mg/L)

Partridge River SW-005

Average Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.1162	0.0730	0.0730	0.0730	0.0730	0.0730	0.0730	0.0726	0.0711	0.125
As	0.0010	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0048	0.053
B	0.0372	0.0480	0.0480	0.0480	0.0480	0.0480	0.0480	0.0481	0.0561	0.5
Ba	0.0088	0.0085	0.0085	0.0085	0.0085	0.0085	0.0085	0.0085	0.0106	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	18.6	17.0	17.0	17.0	17.0	17.0	17.0	17.1	19.9	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0010	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0013	
Cl	6.2	7.8	7.8	7.8	7.8	7.8	7.8	7.9	9.0	230
Co	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0007	0.005
Cu	0.0017	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0019	
Cu-Std	0.0079	0.0099	0.0099	0.0099	0.0099	0.0099	0.0099	0.0100	0.0106	
F	0.0900	0.0829	0.0830	0.0829	0.0830	0.0830	0.0828	0.0828	0.0929	
Fe	1.9900	1.6478	1.6469	1.6471	1.6472	1.6472	1.6458	1.6477	1.6039	
Hardness	82.9	107.5	107.5	107.7	107.6	107.6	107.6	107.9	116.3	
K	1.0	1.3	1.3	1.4	1.4	1.4	1.3	1.4	1.9	
Mg	7.5	8.0	8.0	8.0	8.0	8.0	8.0	8.1	8.6	
Mn	0.1990	0.1469	0.1468	0.1468	0.1469	0.1469	0.1468	0.1468	0.1430	
Na	2.9	3.1	3.1	3.2	3.2	3.2	3.2	3.5	15.7	
Ni	0.0021	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0035	
Ni-Std	0.0445	0.0554	0.0554	0.0555	0.0555	0.0555	0.0555	0.0556	0.0593	
Pb	0.0008	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0007	
Pb-Std	0.0025	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	0.0039	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0042	0.031
Se	0.0005	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0010	0.005
SO ₄	9.0	9.6	9.6	9.7	9.7	9.7	9.7	9.8	15.6	
Ti	0.0002	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0009	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0012	0.0029	
Zn	0.0167	0.0165	0.0165	0.0165	0.0165	0.0165	0.0165	0.0166	0.0174	
Zn-Std	0.0904	0.1127	0.1127	0.1128	0.1128	0.1128	0.1128	0.1130	0.1205	

Notes

- 1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 7-18. Deterministic Water Quality Predictions at surface water monitoring station SW-005 (mg/L)

Partridge River SW-005

High Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Average Measured Conditions	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.1162	0.0702	0.0702	0.0703	0.0703	0.0703	0.0703	0.0702	0.0696	0.125
As	0.0010	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0044	0.053
B	0.0372	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0491	0.5
Ba	0.0088	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0088	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	18.6	17.0	17.0	17.0	17.0	17.0	17.0	17.0	18.3	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0010	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0013	
Cl	6.2	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.3	230
Co	0.0006	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.005
Cu	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0018	
Cu-Std	0.0079	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0104	
F	0.0900	0.0710	0.0710	0.0710	0.0710	0.0710	0.0710	0.0710	0.0743	
Fe	1.9900	1.6036	1.6034	1.6035	1.6035	1.6035	1.6034	1.6035	1.5846	
Hardness	82.9	109.8	109.8	109.8	109.8	109.8	109.8	109.9	113.6	
K	1.0	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.6	
Mg	7.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.2	
Mn	0.1990	0.1498	0.1498	0.1498	0.1498	0.1498	0.1498	0.1498	0.1480	
Na	2.9	2.5	2.5	2.6	2.6	2.6	2.6	2.6	6.4	
Ni	0.0021	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0023	
Ni-Std	0.0445	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	0.0565	0.0581	
Pb	0.0008	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	
Pb-Std	0.0025	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0037	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0026	0.031
Se	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.005
SO ₄	9.0	9.0	9.1	9.1	9.1	9.1	9.1	9.1	11.9	
Ti	0.0002	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0018	
Zn	0.0167	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0165	
Zn-Std	0.0904	0.1147	0.1147	0.1148	0.1148	0.1148	0.1148	0.1148	0.1181	

Notes

- 1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 7-19. Deterministic Water Quality Predictions at USGS gage (mg/L)

Partridge River USGS Gage SW-006

Low Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.001
Al	0.1138	0.1141	0.1140	0.1139	0.1137	0.1132	0.1088	0.1067	0.125
As	0.0028	0.0029	0.0032	0.0034	0.0033	0.0033	0.0034	0.0052	0.053
B	0.0878	0.0875	0.0885	0.0884	0.0884	0.0881	0.0900	0.0942	0.5
Ba	0.0191	0.0191	0.0192	0.0192	0.0192	0.0191	0.0193	0.0207	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	16.2	16.3	16.9	16.9	16.8	16.8	17.5	19.3	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0010	
Cl	5.8	5.7	5.9	5.9	5.8	5.7	6.3	6.7	230
Co	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0016	0.005
Cu	0.0031	0.0032	0.0032	0.0032	0.0032	0.0031	0.0029	0.0029	
Cu-Std	0.0071	0.0071	0.0073	0.0073	0.0073	0.0073	0.0075	0.0079	
F	0.2569	0.2576	0.2573	0.2573	0.2573	0.2561	0.2589	0.2621	
Fe	2.3307	2.3155	2.3259	2.3261	2.3262	2.3123	2.3481	2.3022	
Hardness	72.9	73.1	75.1	75.0	74.8	74.7	77.4	82.9	
K	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.4	
Mg	8.4	8.4	8.5	8.5	8.5	8.4	8.7	8.9	
Mn	0.1063	0.1063	0.1064	0.1065	0.1065	0.1059	0.1053	0.1032	
Na	11.8	11.8	12.2	12.5	12.4	12.4	16.7	22.8	
Ni	0.0138	0.0138	0.0141	0.0145	0.0144	0.0143	0.0143	0.0152	
Ni-Std	0.0399	0.0400	0.0409	0.0409	0.0408	0.0407	0.0420	0.0445	
Pb	0.0010	0.0009	0.0010	0.0010	0.0010	0.0010	0.0010	0.0012	
Pb-Std	0.0021	0.0021	0.0022	0.0022	0.0022	0.0022	0.0023	0.0025	
Sb	0.0015	0.0015	0.0016	0.0016	0.0016	0.0015	0.0016	0.0038	0.031
Se	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0018	0.0020	0.005
SO ₄	17.6	18.0	18.9	19.8	19.6	19.6	20.6	25.6	
Tl	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00056
V	0.0042	0.0042	0.0044	0.0046	0.0045	0.0045	0.0048	0.0058	
Zn	0.0237	0.0236	0.0238	0.0238	0.0238	0.0237	0.0249	0.0244	
Zn-Std	0.0811	0.0813	0.0831	0.0831	0.0829	0.0827	0.0853	0.0904	

Notes

1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 7-20. Deterministic Water Quality Predictions at USGS gage (mg/L)

Partridge River USGS Gage SW-006

Average Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0731	0.0732	0.0732	0.0732	0.0732	0.0731	0.0728	0.0713	0.125
As	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0047	0.053
B	0.0481	0.0481	0.0481	0.0481	0.0481	0.0481	0.0482	0.0558	0.5
Ba	0.0085	0.0085	0.0085	0.0085	0.0085	0.0085	0.0085	0.0105	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	16.9	16.9	17.0	17.0	17.0	17.0	17.1	19.8	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0013	
Cl	7.8	7.8	7.8	7.8	7.8	7.8	7.9	8.9	230
Co	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0007	0.005
Cu	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0019	
Cu-Std	0.0099	0.0099	0.0099	0.0099	0.0099	0.0099	0.0099	0.0106	
F	0.0834	0.0835	0.0834	0.0834	0.0835	0.0833	0.0833	0.0929	
Fe	1.6521	1.6513	1.6515	1.6516	1.6516	1.6503	1.6521	1.6102	
Hardness	107.4	107.3	107.5	107.5	107.5	107.5	107.8	115.7	
K	1.3	1.3	1.4	1.4	1.4	1.3	1.4	1.9	
Mg	8.0	8.0	8.0	8.0	8.0	8.0	8.1	8.5	
Mn	0.1469	0.1469	0.1469	0.1469	0.1469	0.1469	0.1468	0.1432	
Na	3.2	3.2	3.2	3.2	3.2	3.2	3.5	15.1	
Ni	0.0024	0.0024	0.0025	0.0025	0.0025	0.0025	0.0024	0.0035	
Ni-Std	0.0554	0.0554	0.0555	0.0555	0.0555	0.0555	0.0556	0.0590	
Pb	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0007	
Pb-Std	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	0.0035	0.0038	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0040	0.031
Se	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0010	0.005
SO ₄	9.6	9.7	9.7	9.7	9.7	9.7	9.8	15.3	
Tl	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0011	0.0011	0.0011	0.0012	0.0012	0.0011	0.0012	0.0028	
Zn	0.0166	0.0165	0.0166	0.0166	0.0166	0.0165	0.0166	0.0174	
Zn-Std	0.1126	0.1126	0.1127	0.1127	0.1127	0.1127	0.1129	0.1200	

Notes

1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 7-21. Deterministic Water Quality Predictions at USGS gage (mg/L)

Partridge River USGS Gage SW-006

High Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Hardness Independent Standard
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0703	0.0703	0.0703	0.0703	0.0703	0.0703	0.0702	0.0697	0.125
As	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0044	0.053
B	0.0452	0.0452	0.0452	0.0453	0.0453	0.0453	0.0453	0.0492	0.5
Ba	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.0088	
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Ca	17.0	17.0	17.0	17.0	17.0	17.0	17.0	18.3	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	
Cd-Std	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0013	
Cl	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.3	230
Co	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.005
Cu	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0018	
Cu-Std	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0104	
F	0.0711	0.0711	0.0711	0.0711	0.0711	0.0711	0.0711	0.0745	
Fe	1.6041	1.6039	1.6040	1.6040	1.6040	1.6039	1.6040	1.5870	
Hardness	109.8	109.8	109.8	109.8	109.8	109.8	109.8	113.7	
K	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.6	
Mg	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.2	
Mn	0.1497	0.1497	0.1497	0.1498	0.1498	0.1497	0.1497	0.1482	
Na	2.6	2.6	2.6	2.6	2.6	2.6	2.6	6.4	
Ni	0.0016	0.0016	0.0016	0.0017	0.0016	0.0016	0.0016	0.0023	
Ni-Std	0.0565	0.0564	0.0565	0.0565	0.0565	0.0565	0.0565	0.0581	
Pb	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	
Pb-Std	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0037	
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0026	0.031
Se	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.005
SO ₄	9.1	9.1	9.1	9.1	9.1	9.1	9.1	11.9	
Tl	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00056
V	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0018	
Zn	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0160	0.0165	
Zn-Std	0.1147	0.1147	0.1148	0.1148	0.1148	0.1148	0.1148	0.1182	

Notes

1) The hardness dependent standards for Cd, Cu, Ni, Pb and Zn are listed below the Deterministic Water Quality Predictions for each parameter.

Table 7-22. Deterministic Water Quality Predictions in Colby Lake (mg/L)

Colby Lake

Low Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Standard (Reference Hardness = 100 mg/L)
Ag	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001
Al	0.0764	0.0764	0.0763	0.0763	0.0763	0.0762	0.0757	0.0745	0.125
As	0.0022	0.0022	0.0022	0.0023	0.0023	0.0023	0.0023	0.0041	0.01
B	0.0509	0.0509	0.0510	0.0510	0.0510	0.0509	0.0511	0.0562	
Ba	0.0093	0.0093	0.0093	0.0093	0.0093	0.0093	0.0093	0.0109	2
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.004
Ca	16.9	16.9	16.9	16.9	16.9	16.9	17.0	18.9	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0011
Cl	7.7	7.7	7.7	7.7	7.7	7.7	7.8	8.3	230
Co	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0008	0.0028
Cu	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0021	0.0093
F	0.0965	0.0967	0.0965	0.0965	0.0965	0.0962	0.0962	0.1030	2
Fe	1.7130	1.7114	1.7117	1.7118	1.7118	1.7096	1.7126	1.6805	0.3
Hardness	104.7	104.7	105.0	105.0	104.9	104.9	105.3	110.5	500
K	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.7	
Mg	8.0	8.0	8.1	8.1	8.1	8.1	8.1	8.4	
Mn	0.1443	0.1443	0.1443	0.1444	0.1444	0.1443	0.1443	0.1415	
Na	3.8	3.8	3.9	3.9	3.9	3.9	4.4	10.9	
Ni	0.0033	0.0033	0.0034	0.0034	0.0034	0.0034	0.0034	0.0045	0.052
Pb	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0007	0.0032
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0037	0.0055
Se	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0009	0.005
SO ₄	10.2	10.2	10.3	10.4	10.4	10.4	10.5	15.8	250
Tl	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0003	0.00028
Zn	0.0175	0.0175	0.0175	0.0175	0.0175	0.0175	0.0176	0.0180	0.106

Table 7-23. Deterministic Water Quality Predictions in Colby Lake (mg/L)

Colby Lake

Average Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Standard (Reference Hardness = 100 mg/L)
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0730	0.0730	0.0730	0.0730	0.0730	0.0730	0.0727	0.0716	0.125
As	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0041	0.01
B	0.0478	0.0478	0.0478	0.0479	0.0479	0.0478	0.0479	0.0539	
Ba	0.0085	0.0085	0.0085	0.0085	0.0085	0.0085	0.0085	0.0100	2
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.004
Ca	16.9	16.9	17.0	17.0	17.0	17.0	17.0	19.2	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0011
Cl	7.9	7.9	7.9	7.9	7.9	7.9	7.9	8.7	230
Co	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0007	0.0028
Cu	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0018	0.0019	0.0093
F	0.0826	0.0827	0.0826	0.0826	0.0826	0.0825	0.0825	0.0901	2
Fe	1.6534	1.6528	1.6530	1.6530	1.6531	1.6520	1.6534	1.6206	0.3
Hardness	107.5	107.5	107.6	107.6	107.6	107.6	107.8	114.0	500
K	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.7	
Mg	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.4	
Mn	0.1473	0.1473	0.1473	0.1473	0.1473	0.1473	0.1473	0.1444	
Na	3.1	3.1	3.1	3.2	3.2	3.1	3.4	12.5	
Ni	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0033	0.052
Pb	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0007	0.0032
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0035	0.0055
Se	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0009	0.005
SO ₄	9.6	9.6	9.6	9.6	9.6	9.6	9.7	14.0	250
Tl	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00028
Zn	0.0167	0.0167	0.0167	0.0167	0.0167	0.0167	0.0168	0.0174	0.106

Table 7-24. Deterministic Water Quality Predictions in Colby Lake (mg/L)

Colby Lake

High Flow Conditions - Mine Site - Reasonable Alternative 1

Parameter	Year 01	Year 05	Year 10	Year 12	Year 15	Year 20	Closure	Post-Closure	Standard (Reference Hardness = 100 mg/L)
Ag	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001
Al	0.0716	0.0717	0.0718	0.0718	0.0718	0.0718	0.0716	0.0707	0.125
As	0.0021	0.0021	0.0021	0.0022	0.0022	0.0022	0.0022	0.0049	0.01
B	0.0465	0.0465	0.0465	0.0466	0.0466	0.0465	0.0466	0.0512	
Ba	0.0081	0.0081	0.0081	0.0081	0.0081	0.0081	0.0081	0.0094	2
Be	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.004
Ca	17.0	17.0	17.0	17.0	17.0	17.0	17.0	18.6	
Cd	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0011
Cl	7.9	7.9	7.9	7.9	7.9	7.9	7.9	8.3	230
Co	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.0028
Cu	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0093
F	0.0767	0.0768	0.0768	0.0768	0.0768	0.0767	0.0767	0.0804	2
Fe	1.6284	1.6283	1.6284	1.6285	1.6286	1.6280	1.6286	1.6050	0.3
Hardness	108.7	108.7	108.9	108.9	108.8	108.8	108.9	113.5	500
K	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.6	
Mg	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.3	
Mn	0.1486	0.1486	0.1486	0.1486	0.1486	0.1486	0.1486	0.1466	
Na	2.8	2.8	2.9	2.9	2.9	2.9	3.0	7.5	
Ni	0.0020	0.0020	0.0021	0.0021	0.0021	0.0021	0.0020	0.0027	0.052
Pb	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.0032
Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0029	0.0055
Se	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0007	0.005
SO ₄	9.3	9.3	9.4	9.4	9.4	9.4	9.4	12.7	250
Tl	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.00028
Zn	0.0164	0.0164	0.0164	0.0164	0.0164	0.0164	0.0164	0.0169	0.106

Table 8-1. Background/Recharge Concentrations Used in Mine Site – RA1 Groundwater Models

Model	Recharge concentration source data (surficial deposits)¹	Background concentration source data (surficial deposits)¹	Background concentration source data (bedrock)
Category 1 – Overburden Stockpile	Average values from well MW-05-8	Average values from well MW-05-8	N/A
West Pit	Average values from well MW-05-8	West Pit water quality predictions	Average values from mine site bedrock wells
East Pit and Category 4 Waste Rock Stockpile	Average values from well MW-05-2	East Pit water quality predictions	Average values from mine site bedrock wells
Category 2/3 Waste Rock Stockpile	Average values from well MW-05-2	East Pit water quality predictions	N/A
Category 3 Lean Ore Stockpile	Average values from well MW-05-2	Average values from well MW-05-2	N/A
Lean Ore Surge Pile	Average values from well MW-05-2	Average values from well MW-05-2	N/A

¹ Recharge and background concentrations were set using water quality data from the well nearest the cross-section

**Table 8-2. Predicted Groundwater Concentrations - Screening Level Model - Mine Site RA1
Category 1 Stockpile with Overburden - Low Liner Leakage Concentrations**

Source Proportional Contribution

	Surficial Deposits	
	Property Boundary	Partridge River
Category 1	0.2063	0.1556
Recharge	0.1975	0.3949
Overburden	0.5962	0.4495

Parameter	Units	GW Standard	EPA sMCL	Cat 1 Predicted Concentrations Post-Closure	Recharge/ background concentration	Overburden concentration	Surficial Deposits	
							Predicted concentration, property boundary	Predicted concentration, Partridge River
Ag	mg/L	0.030	0.10	0.0007	0.00066	0	0.0003	0.0004
Al	mg/L	--	0.05	1.6800	1.653	0.14	0.7565	0.9771
As	mg/L	0.010	--	0.1552	0.00283	0.0027	0.0342	0.0265
B	mg/L	0.600	--	0.5810	0.02683	0.037	0.1472	0.1176
Ba	mg/L	2	--	0.1900	0.03087	0.014	0.0536	0.0480
Be	mg/L	8.0E-05	--	0.0002	0.00010	0	0.00006	0.00007
Ca	mg/L	--	--	540.0000	13.83	15.8	123.5534	96.5876
Cd	mg/L	0.004	--	0.0002	0.00010	0	0.0001	0.0001
Cl	mg/L	--	250.00	49.6586	1.19	2.33	11.8687	9.2441
Co	mg/L	--	--	0.0235	0.0013	0.0013	0.0059	0.0048
Cu	mg/L	1.3	1.00	0.0920	0.00783	0.017	0.0307	0.0250
F	mg/L	4	2.00	0.0630	0.16	0.42	0.2950	0.2618
Fe	mg/L	--	0.30	0.8100	1.85	0.15	0.6219	0.9240
Hardness	mg/L	--	--	1729.3495	62.40	71.5	411.7171	325.8678
K	mg/L	--	--	49.0000	1.57	4.45	13.0719	10.2447
Mg	mg/L	--	--	93.0000	6.76	9.01	25.8928	21.1903
Mn	mg/L	--	0.05	0.3549	0.197	0.116	0.1813	0.1852
Na	mg/L	--	--	242.4332	12.17	7.19	56.7042	45.7604
Ni	mg/L	0.100	--	0.1531	0.00570	0.019	0.0440	0.0346
Pb	mg/L	0.015	--	0.0183	0.00050	0	0.0039	0.0030
Sb	mg/L	0.006	--	0.0800	0.0015	0.0004	0.0170	0.0132
Se	mg/L	0.030	--	0.0029	0.001	0.002	0.0019	0.0017
SO ₄	mg/L	250	250.00	592.8026	17.57	68.30	166.4857	129.8793
Tl	mg/L	6E-04	--	0.0000	0.001	0.00000	0.0002	0.0004
V	mg/L	0.050	--	0.1900	0.00	0.0014	0.0400	0.0302
Zn	mg/L	2	5.00	0.0900	0.0075	0.003	0.0218	0.0183

Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge/background concentrations are average groundwater quality data from MW-05-8 with non-detects set at 1/2 the detection limit

Table 8-3. Predicted Groundwater Concentrations - Screening Level Model - Mine Site RA1
Category 1 Stockpile with Overburden - Average Liner Leakage Concentrations

Source Proportional Contribution		
	Surficial Deposits	
	Property Boundary	Partridge River
Category 1	0.2063	0.1556
Recharge	0.1975	0.3949
Overburden	0.5962	0.4495

Parameter	Units	GW Standard	EPA sMCL	Cat 1 Predicted Concentrations Post-Closure	Recharge/ background concentration	Overburden concentration	Surficial Deposits	
							Predicted concentration, property boundary	Predicted concentration, Partridge River
Ag	mg/L	0.030	0.10	0.0007	0.00066	0	0.0003	0.0003
Al	mg/L	--	0.05	1.6800	1.653	0.14	0.7565	0.7565
As	mg/L	0.010	--	0.2237	0.00283	0.0027	0.0483	0.0483
B	mg/L	0.600	--	0.7600	0.02683	0.037	0.1841	0.1841
Ba	mg/L	2	--	0.1900	0.03087	0.014	0.0536	0.0536
Be	mg/L	8.0E-05	--	0.0002	0.00010	0	0.00006	0.00006
Ca	mg/L	--	--	540.0000	13.83	15.8	123.5534	123.5534
Cd	mg/L	0.004	--	0.0002	0.00010	0	0.0001	0.0001
Cl	mg/L	--	250.00	71.4445	1.19	2.33	16.3632	16.3632
Co	mg/L	--	--	0.0339	0.0013	0.0013	0.0080	0.0080
Cu	mg/L	1.3	1.00	0.0920	0.00783	0.017	0.0307	0.0307
F	mg/L	4	2.00	0.0629	0.16	0.42	0.2950	0.2950
Fe	mg/L	--	0.30	0.8100	1.85	0.15	0.6219	0.6219
Hardness	mg/L	--	--	1729.3495	62.40	71.5	411.7171	411.7171
K	mg/L	--	--	49.0000	1.57	4.45	13.0719	13.0719
Mg	mg/L	--	--	93.0000	6.76	9.01	25.8928	25.8928
Mn	mg/L	--	0.05	0.5115	0.197	0.116	0.2136	0.2136
Na	mg/L	--	--	349.3890	12.17	7.19	78.7692	78.7692
Ni	mg/L	0.100	--	0.2206	0.00570	0.019	0.0580	0.0580
Pb	mg/L	0.015	--	0.0264	0.00050	0	0.0055	0.0055
Sb	mg/L	0.006	--	0.0800	0.0015	0.0004	0.0170	0.0170
Se	mg/L	0.030	--	0.0029	0.001	0.002	0.0019	0.0019
SO ₄	mg/L	250	250.00	854.3331	17.57	68.30	220.4395	220.4395
Tl	mg/L	6E-04	--	0.0000	0.001	0.00000	0.0002	0.0002
V	mg/L	0.050	--	0.1900	0.00	0.0014	0.0400	0.0400
Zn	mg/L	2	5.00	0.0900	0.0075	0.003	0.0218	0.0218

Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge/background concentrations are average groundwater quality data from MW-05-8 with non-detects set at 1/2 the detection limit

**Table 8-4. Predicted Groundwater Concentrations - Screening Level Model - Mine Site RA1
Category 1 Stockpile with Overburden - High Liner Leakage Concentrations**

Source Proportional Contribution

	Surficial Deposits	
	Property Boundary	Partridge River
Category 1	0.2063	0.1556
Recharge	0.1975	0.3949
Overburden	0.5962	0.4495

Parameter	Units	GW Standard	EPA sMCL	Cat 1 Predicted Concentrations Post-Closure	Recharge/background concentration	Overburden concentration	Surficial Deposits	
							Predicted concentration, property boundary	Predicted concentration, Partridge River
Ag	mg/L	0.030	0.10	0.0007	0.00066	0	0.0003	0.0004
Al	mg/L	--	0.05	1.6800	1.653	0.14	0.7565	0.9771
As	mg/L	0.010	--	0.4854	0.00283	0.0027	0.1023	0.0779
B	mg/L	0.600	--	0.7600	0.02683	0.037	0.1841	0.1455
Ba	mg/L	2	--	0.1900	0.03087	0.014	0.0536	0.0480
Be	mg/L	8.0E-05	--	0.0002	0.00010	0	0.00006	0.00007
Ca	mg/L	--	--	540.0000	13.83	15.8	123.5534	96.5876
Cd	mg/L	0.004	--	0.0002	0.00010	0	0.0001	0.0001
Cl	mg/L	--	250.00	136.3837	1.19	2.33	29.7601	22.7386
Co	mg/L	--	--	0.0520	0.0013	0.0013	0.0118	0.0092
Cu	mg/L	1.3	1.00	0.0920	0.00783	0.017	0.0307	0.0250
F	mg/L	4	2.00	0.0628	0.16	0.42	0.2950	0.2617
Fe	mg/L	--	0.30	0.8100	1.85	0.15	0.6219	0.9240
Hardness	mg/L	--	--	1729.3495	62.40	71.5	411.7171	325.8678
K	mg/L	--	--	49.0000	1.57	4.45	13.0719	10.2447
Mg	mg/L	--	--	93.0000	6.76	9.01	25.8928	21.1903
Mn	mg/L	--	0.05	0.7500	0.197	0.116	0.2628	0.2466
Na	mg/L	--	--	681.0000	12.17	7.19	147.1806	114.0014
Ni	mg/L	0.100	--	0.4787	0.00570	0.019	0.1112	0.0853
Pb	mg/L	0.015	--	0.0528	0.00050	0	0.0110	0.0084
Sb	mg/L	0.006	--	0.0800	0.0015	0.0004	0.0170	0.0132
Se	mg/L	0.030	--	0.0029	0.001	0.002	0.0019	0.0017
SO ₄	mg/L	250	250.00	1854.0847	17.57	68.30	426.6882	326.1348
Tl	mg/L	6E-04	--	0.0000	0.001	0.00000	0.0002	0.0004
V	mg/L	0.050	--	0.1900	0.00	0.0014	0.0400	0.0302
Zn	mg/L	2	5.00	0.0900	0.0075	0.003	0.0218	0.0183

Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge/background concentrations are average groundwater quality data from MW-05-8 with non-detects set at 1/2 the detection limit

Table 8-5. Predicted Groundwater Concentrations - Screening Level Model - Mine Site RA1
West Pit Flow Path - Low Liner Leakage Rates

Source Proportional Contribution				
	Surficial Deposits		Bedrock	
	Property Boundary	Partridge River	Property Boundary	Partridge River
West Pit	0.4224	0.4048	0.4214	0.3099
Recharge	0.5776	0.5952	0.5786	0.6901

Parameter	Units	GW Standard	EPA sMCL	West Pit Predicted Concentrations After West Pit Flooding	Recharge/ background concentration, surficial deposits	Surficial deposits		Bedrock	
						Predicted concentration, property boundary	Predicted concentration, Partridge River	Predicted concentration, property boundary	Predicted concentration, Partridge River
SO ₄	mg/l	--	250.00	270.86	17.57	124.57	120.10	124.31	96.06
Ag	mg/l	0.030	0.100	0.0009	6.60E-04	0.00078	0.00077	0.00078	0.00075
Al	mg/l	--	0.05	0.019	1.653	0.96	0.99	0.96	1.15
As	mg/l	0.01		0.090	0.0028	0.040	0.038	0.040	0.030
B	mg/l	0.60		0.30	0.0268	0.14	0.14	0.14	0.11
Ba	mg/l	2		0.086	0.0309	0.05	0.05	0.05	0.05
Be	mg/l	8.00E-05		0.00080	1.00E-04	0.00040	0.00038	0.00039	0.00032
Ca	mg/l	--		107.09	13.83	53.23	51.58	53.13	42.73
Cd	mg/l	0.004		0.00017	1.00E-04	0.00013	0.00013	0.00013	0.00012
Cl	mg/l	--	250.00	32.29	1.19	14.33	13.78	14.29	10.83
Co	mg/l	--		0.0069	0.0013	0.0036	0.0035	0.0036	0.0030
Cu	mg/l	1.30	1.00	0.006	0.00783	0.0071	0.0071	0.0071	0.0073
F	mg/l	4.00	2.00	0.42	0.16	0.27	0.26	0.27	0.24
Fe	mg/l	--	0.30	0.10	1.85	1.11	1.14	1.11	1.31
Hardness	mg/l	--		361.71	62.40	188.84	183.56	188.53	155.16
K	mg/l	--		17.59	1.57	8.34	8.05	8.32	6.53
Mg	mg/l	--		23.00	6.76	13.62	13.33	13.60	11.79
Mn	mg/l	--	0.05	0.01	0.197	0.12	0.12	0.12	0.14
Na	mg/l	--		324.84	12.17	144.25	138.74	143.93	109.06
Ni	mg/l	0.10		0.061	0.0057	0.029	0.028	0.029	0.023
Pb	mg/l	0.015		0.0077	5.00E-04	0.0036	0.0034	0.0036	0.0027
Sb	mg/l	0.006		0.1098	1.50E-03	0.0473	0.0454	0.0472	0.0351
Se	mg/l	0.030		0.0108	0.001	0.0051	0.0050	0.0051	0.0040
Tl	mg/l	0.0006		0.00019	0.001	0.00066	0.00067	0.00066	0.00075
Zn	mg/l	2.00	5.00	0.039	0.0075	0.021	0.020	0.021	0.017

 Groundwater standard exceedance

 EPA sMCL exceedance

-- No applicable standard

Recharge/background concentrations are average groundwater quality data from MW-05-8 with non-detects set at 1/2 the detection limit

Table 8-6. Predicted Groundwater Concentrations - Screening Level Model - Mine Site RA1
West Pit Flow Path - Average Liner Leakage Rates

Source Proportional Contribution									
		Surficial Deposits				Bedrock			
		Property Boundary		Partridge River		Property Boundary		Partridge River	
West Pit		0.4224		0.4048		0.4214		0.3099	
Recharge		0.5776		0.5952		0.5786		0.6901	

						Surficial deposits		Bedrock	
Parameter	Units	GW Standard	EPA sMCL	West Pit Predicted Concentrations After West Pit Flooding	Recharge/ background concentration, surficial deposits	Predicted concentration, property boundary	Predicted concentration, Partridge River	Predicted concentration, property boundary	Predicted concentration, Partridge River
SO ₄	mg/l	--	250.00	218.98	17.57	102.65	99.10	102.45	79.99
Ag	mg/l	0.030	0.100	0.0009	6.60E-04	0.00074	0.00074	0.00074	0.00072
Al	mg/l	--	0.05	0.019	1.653	0.96	0.99	0.96	1.15
As	mg/l	0.01		0.096	0.0028	0.042	0.041	0.042	0.032
B	mg/l	0.60		0.34	0.0268	0.16	0.15	0.16	0.12
Ba	mg/l	2		0.084	0.0309	0.05	0.05	0.05	0.05
Be	mg/l	8.00E-05		0.00070	1.00E-04	0.00035	0.00034	0.00035	0.00029
Ca	mg/l	--		120.01	13.83	58.68	56.81	58.57	46.74
Cd	mg/l	0.004		0.00023	1.00E-04	0.00015	0.00015	0.00015	0.00014
Cl	mg/l	--	250.00	48.05	1.19	20.99	20.16	20.94	15.71
Co	mg/l	--		0.0048	0.0013	0.0028	0.0027	0.0028	0.0024
Cu	mg/l	1.30	1.00	0.006	0.00783	0.0071	0.0071	0.0071	0.0073
F	mg/l	4.00	2.00	0.45	0.16	0.28	0.28	0.28	0.25
Fe	mg/l	--	0.30	0.10	1.85	1.11	1.14	1.11	1.31
Hardness	mg/l	--		407.49	62.40	208.18	202.09	207.82	169.34
K	mg/l	--		20.64	1.57	9.63	9.29	9.61	7.48
Mg	mg/l	--		26.30	6.76	15.01	14.67	14.99	12.81
Mn	mg/l	--	0.05	0.01	0.197	0.12	0.12	0.12	0.14
Na	mg/l	--		442.66	12.17	194.03	186.43	193.58	145.58
Ni	mg/l	0.10		0.043	0.0057	0.022	0.021	0.022	0.017
Pb	mg/l	0.015		0.0072	5.00E-04	0.0033	0.0032	0.0033	0.0026
Sb	mg/l	0.006		0.0961	1.50E-03	0.0415	0.0398	0.0414	0.0308
Se	mg/l	0.030		0.0148	0.001	0.0068	0.0066	0.0068	0.0053
Tl	mg/l	0.0006		0.00017	0.001	0.00065	0.00067	0.00065	0.00074
Zn	mg/l	2.00	5.00	0.048	0.0075	0.024	0.024	0.024	0.020

Groundwater standard exceedance
EPA sMCL exceedance
-- No applicable standard

Recharge/background concentrations are average groundwater quality data from MW-05-8 with non-detects set at 1/2 the detection limit

**Table 8-7. Predicted Groundwater Concentrations - Screening Level Model - Mine Site RA1
West Pit Flow Path - High Liner Leakage Rates**

Source Proportional Contribution				
	Surficial Deposits		Bedrock	
	Property Boundary	Partridge River	Property Boundary	Partridge River
West Pit	0.4224	0.4048	0.4214	0.3099
Recharge	0.5776	0.5952	0.5786	0.6901

Parameter	Units	GW Standard	EPA sMCL	West Pit Predicted Concentrations After West Pit Flooding	Recharge concentration	Surficial deposits		Bedrock	
						Predicted concentration, property boundary	Predicted concentration, Partridge River	Predicted concentration, property boundary	Predicted concentration, Partridge River
SO ₄	mg/l	--	250.00	233.18	17.57	108.65	104.85	108.43	84.39
Ag	mg/l	0.030	0.100	0.0008	6.60E-04	0.00071	0.00071	0.00071	0.00070
Al	mg/l	--	0.05	0.019	1.653	0.96	0.99	0.96	1.15
As	mg/l	0.01		0.188	0.0028	0.081	0.078	0.081	0.060
B	mg/l	0.60		0.36	0.0268	0.17	0.16	0.17	0.13
Ba	mg/l	2		0.094	0.0309	0.06	0.06	0.06	0.05
Be	mg/l	8.00E-05		0.00061	1.00E-04	0.00031	0.00031	0.00031	0.00026
Ca	mg/l	--		121.08	13.83	59.14	57.25	59.03	47.07
Cd	mg/l	0.004		0.00020	1.00E-04	0.00014	0.00014	0.00014	0.00013
Cl	mg/l	--	250.00	30.30	1.19	13.49	12.98	13.46	10.21
Co	mg/l	--		0.0063	0.0013	0.0034	0.0033	0.0034	0.0028
Cu	mg/l	1.30	1.00	0.006	0.00783	0.0071	0.0071	0.0071	0.0073
F	mg/l	4.00	2.00	0.34	0.16	0.24	0.23	0.24	0.22
Fe	mg/l	--	0.30	0.10	1.85	1.11	1.14	1.11	1.31
Hardness	mg/l	--		407.51	62.40	208.19	202.10	207.83	169.35
K	mg/L	--		22.01	1.57	10.21	9.85	10.18	7.91
Mg	mg/l	--		25.65	6.76	14.74	14.41	14.72	12.61
Mn	mg/l	--	0.05	0.01	0.197	0.12	0.12	0.12	0.14
Na	mg/l	--		310.42	12.17	138.16	132.90	137.85	104.60
Ni	mg/l	0.10		0.052	0.0057	0.025	0.024	0.025	0.020
Pb	mg/l	0.015		0.0066	5.00E-04	0.0031	0.0030	0.0031	0.0024
Sb	mg/l	0.006		0.0919	1.50E-03	0.0397	0.0381	0.0396	0.0295
Se	mg/l	0.030		0.0100	0.001	0.0048	0.0046	0.0048	0.0038
Tl	mg/l	0.0006		0.00018	0.001	0.00065	0.00067	0.00065	0.00074
Zn	mg/l	2.00	5.00	0.052	0.0075	0.026	0.025	0.026	0.021

Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge concentrations are average groundwater quality data from MW-05-8 with non-detects set at 1/2 the detection limit

Table 8-8. Predicted Groundwater Concentrations - Screening Level Model - Mine Site RA1, East Pit & Category 4 Stockpile Flow Path - Low Liner Leakage

Source Area Proportional Contributions

	Surficial Deposits	Bedrock
	Partridge River/ Property Boundary	Partridge River/ Property Boundary
Category 4 Stockpile	8.87E-05	8.91E-05
East Pit (Surficial)	0.1705	0.1713
East Pit (Bedrock)	0.0002	0.0002
Recharge	0.8288	0.8277

Parameter	Units	GW Standard	EPA sMCL	Cat 4 Predicted Concentrations (Mine Year 20)	East Pit Pore Water Predicted Concentrations (Bedrock Background)	Total East Pit Predicted Concentrations (Surficial Background)	Recharge concentration	Surficial Deposits	Bedrock
								Predicted concentration, Partridge River/property boundary	Predicted concentration, Partridge River/property boundary
Ag	mg/L	0.030	0.10	0.0007	0.0007	0.00035	0.00075	0.001	0.001
Al	mg/L	--	0.05	1.6800	1.68	0.016	0.1768	0.150	0.150
As	mg/L	0.010	--	0.7100	0.710	0.0177	0.00210	0.005	0.005
B	mg/L	0.600	--	0.7600	0.76	0.42	0.02125	0.090	0.090
Ba	mg/L	2	--	0.1900	0.19	0.048	0.00500	0.012	0.012
Be	mg/L	8.0E-05	--	0.0002	0.00020	1.19E-04	0.00010	0.0001	0.0001
Ca	mg/L	--	--	540.00	540.00	167.3	24.35	48.863	48.971
Cd	mg/L	0.004	--	0.0002	0.00018	2.3E-04	0.00010	0.000	0.000
Cl	mg/L	--	250.00	0.5331	340.07	126.41	1.21	22.626	22.726
Co	mg/L	--	--	0.0520	0.0520	8.75E-05	0.00050	0.000	0.000
Cu	mg/L	1.3	1.00	0.09	0.092	0.0010	0.00680	0.006	0.006
F	mg/L	4	2.00	0.0621	0.54	0.61	0.13	0.211	0.212
Fe	mg/L	--	0.30	0.8100	0.81	0.00028	0.202	0.168	0.167
Hardness	mg/L	--	--	1,729.35	1732.716049	561.6	77.3	160.333	160.699
K	mg/L	--	--	49.0000	49.00	29.89	1.365	6.241	6.264
Mg	mg/L	--	--	93.00	93.00	34.96	3.98	9.287	9.311
Mn	mg/L	--	0.05	0.7500	0.75	0.0002	0.039	0.032	0.032
Na	mg/L	--	--	681.00	681.00	1108.94	8.64	196.434	197.313
Ni	mg/L	0.100	--	0.86	0.860	0.00075	0.001	0.001	0.001
Pb	mg/L	0.015	--	0.0528	0.0528	0.0131	0.00050	0.003	0.003
Sb	mg/L	0.006	--	0.0800	0.080	0.0126	0.0015	0.003	0.003
Se	mg/L	0.030	--	0.0029	0.0029	0.035	0.0001	0.006	0.006
SO ₄	mg/L	--	250.00	2,340.00	2340.00	334.6	13.6	69.004	69.260
TI	mg/L	6E-04	--	0.0000	0.00002	0.00001	0.001	0.001	0.001
V	mg/L	0.050	--	0.19	0.19	0.056		0.010	0.010
Zn	mg/L	2	5.00	0.0900	0.090	0.029	0.00875	0.012	0.012

Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge concentrations are average groundwater quality data from MW-05-2 with non-detects set at 1/2 the detection limit

Background concentrations are predicted East Pit concentrations during West Pit Filling

Table 8-9. Predicted Groundwater Concentrations - Screening Level Model - Mine Site RA1, East Pit & Category 4 Stockpile Flow Path - Average Liner Leakage

Source Area Proportional Contributions

	Surficial Deposits	Bedrock
	Partridge River/ Property Boundary	Partridge River/ Property Boundary
Category 4 Stockpile	1.45E-04	1.46E-04
East Pit (Surficial)	0.1704	0.1713
East Pit (Bedrock)	2.02E-04	2.03E-04
Recharge	0.8287	0.8278

Parameter	Units	GW Standard	EPA SMCL	Cat 4 Predicted Concentrations (Mine Year 20)	East Pit Pore Water Predicted Concentrations (Bedrock Background)	Total East Pit Predicted Concentrations (Surficial Background)	Recharge concentration	Surficial Deposits Predicted concentration, Partridge River/property boundary	Bedrock Predicted concentration, Partridge River/property boundary
Ag	mg/L	0.030	0.10	0.0007	0.0007	0.00029	0.00075	0.001	0.001
Al	mg/L	--	0.05	1.6800	1.68	0.037	0.1768	0.153	0.153
As	mg/L	0.010	--	0.7100	0.710	0.0148	0.00210	0.005	0.005
B	mg/L	0.600	--	0.7600	0.76	0.37	0.02125	0.080	0.081
Ba	mg/L	2	--	0.1900	0.19	0.040	0.00500	0.011	0.011
Be	mg/L	8.0E-05	--	0.0002	0.00020	9.88E-05	0.00010	0.0001	0.0001
Ca	mg/L	--	--	540.00	540.00	144.9	24.35	45.050	45.160
Cd	mg/L	0.004	--	0.0002	0.00018	1.88E-04	0.00010	0.000	0.000
Cl	mg/L	--	250.00	0.7659	340.07	107.88	1.21	19.454	19.550
Co	mg/L	--	--	0.0520	0.0520	7.28E-05	0.00050	0.000	0.000
Cu	mg/L	1.3	1.00	0.09	0.092	0.0014	0.00680	0.006	0.006
F	mg/L	4	2.00	0.0621	0.54	0.53	0.13	0.198	0.198
Fe	mg/L	--	0.30	0.8100	0.81	0.54	0.202	0.260	0.260
Hardness	mg/L	--	--	1,729.35	1732.7	503.6	77.3	150.472	150.859
K	mg/L	--	--	49.0000	49.00	25.31	1.365	5.461	5.483
Mg	mg/L	--	--	93.00	93.00	31.74	3.98	8.739	8.764
Mn	mg/L	--	0.05	0.7500	0.75	0.05	0.039	0.041	0.041
Na	mg/L	--	--	681.00	681.00	924.26	8.64	164.890	165.715
Ni	mg/L	0.100	--	0.86	0.860	0.00062	0.001	0.001	0.001
Pb	mg/L	0.015	--	0.0528	0.0528	0.0111	0.00050	0.002	0.002
Sb	mg/L	0.006	--	0.0800	0.080	0.0110	0.0015	0.003	0.003
Se	mg/L	0.030	--	0.0029	0.0029	0.029	0.0001	0.005	0.005
SO ₄	mg/L	--	250.00	2,340.00	2340.00	281.56	13.6	60.060	60.305
Tl	mg/L	6E-04	--	0.0000	0.00002	0.00014	0.001	0.001	0.001
V	mg/L	0.050	--	0.19	0.19	0.047		0.008	0.008
Zn	mg/L	2	5.00	0.0900	0.090	0.029	0.00875	0.012	0.012

Groundwater standard exceedance

EPA SMCL exceedance

No applicable standard

Recharge concentrations are average groundwater quality data from MW-05-2 with non-detects set at 1/2 the detection limit

Background concentrations are predicted East Pit concentrations during West Pit Filling

Table 8-10. Predicted Groundwater Concentrations - Screening Level Model - Mine Site RA1, East Pit & Category 4 Stockpile Flow Path - High Liner Leakage

Source Area Proportional Contributions

	Surficial Deposits	Bedrock
	Partridge River/ Property Boundary	Partridge River/ Property Boundary
Category 4 Stockpile	4.09E-03	4.11E-03
East Pit (Surficial)	0.1676	0.1684
East Pit (Bedrock)	1.97E-04	1.98E-04
Recharge	0.8279	0.8267

Parameter	Units	GW Standard	EPA sMCL	Cat 4 Predicted Concentrations (Mine Year 20)	East Pit Pore Water Predicted Concentrations (Bedrock Background)	Total East Pit Predicted Concentrations (Surficial Background)	Recharge concentration	Surficial Deposits Predicted concentration, Partridge River/property boundary	Bedrock Predicted concentration, Partridge River/property boundary
Ag	mg/L	0.030	0.10	0.0007	0.0007	0.00020	0.00075	0.001	0.001
Al	mg/L	--	0.05	1.6800	1.68	0.046	0.1768	0.161	0.161
As	mg/L	0.010	--	0.7100	0.710	0.0100	0.00210	0.006	0.006
B	mg/L	0.600	--	0.7600	0.76	0.26	0.02125	0.064	0.065
Ba	mg/L	2	--	0.1900	0.19	0.027	0.00500	0.009	0.009
Be	mg/L	8.0E-05	--	0.0002	0.00020	6.67E-05	0.00010	0.0001	0.0001
Ca	mg/L	--	--	540.00	540.00	102.6	24.35	39.669	39.732
Cd	mg/L	0.004	--	0.0002	0.00018	1.27E-04	0.00010	0.000	0.000
Cl	mg/L	--	250.00	1.3263	340.07	75.1	1.21	13.657	13.716
Co	mg/L	--	--	0.0520	0.0520	4.92E-05	0.00050	0.001	0.001
Cu	mg/L	1.3	1.00	0.09	0.092	0.0014	0.00680	0.006	0.006
F	mg/L	4	2.00	0.0621	0.54	0.38	0.13	0.171	0.171
Fe	mg/L	--	0.30	0.8100	0.81	0.85	0.202	0.313	0.313
Hardness	mg/L	--	--	1,729.35	1732.7	371.0	77.3	133.596	133.835
K	mg/L	--	--	49.0000	49.00	17.45	1.365	4.265	4.278
Mg	mg/L	--	--	93.00	93.00	23.68	3.98	7.662	7.678
Mn	mg/L	--	0.05	0.7500	0.75	0.08	0.039	0.048	0.048
Na	mg/L	--	--	681.00	681.00	624.6	8.64	114.750	115.252
Ni	mg/L	0.100	--	0.86	0.860	0.00042	0.001	0.005	0.005
Pb	mg/L	0.015	--	0.0528	0.0528	0.0076	0.00050	0.002	0.002
Sb ⁽¹⁾	mg/L	0.006	--	0.0800	0.080	0.0079	0.0015	0.003	0.003
Se	mg/L	0.030	--	0.0029	0.0029	0.020	0.0001	0.003	0.003
SO ₄	mg/L	--	250.00	2,340.00	2340.00	192.6	13.6	53.576	53.761
Tl	mg/L	6E-04	--	0.0000	0.00002	0.00022	0.001	0.001	0.001
V	mg/L	0.050	--	0.19	0.19	0.032		0.006	0.006
Zn	mg/L	2	5.00	0.0900	0.090	0.024	0.00875	0.012	0.012

Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge concentrations are average groundwater quality data from MW-05-2 with non-detects set at 1/2 the detection limit

Background concentrations are predicted East Pit concentrations during West Pit Filling

Table 8-11. Predicted Groundwater Concentrations - Screening Level Model - Mine Site RA1, Category 2/3 Stockpile Flow Path - Low Liner Leakage

Source Proportional Contribution

	Surficial Deposits
	Partridge River
Category 2/3	3.313E-03
Recharge	0.3884
Up-Gradient (East Pit)	0.6083

Parameter	Units	GW Standard	EPA sMCL	Cat 2/3 Predicted Concentrations After West Pit Flooding	East Pit Predicted Concentrations During West Pit Flooding (Background)	Recharge Concentration	Surficial Deposits
							Predicted concentration, Partridge River
Ag	mg/L	0.030	0.10	0.0007	0.00035	0.00075	0.001
Al	mg/L	--	0.05	1.6800	0.016	0.1768	0.084
As	mg/L	0.010		0.7100	0.0177	0.00210	0.014
B	mg/L	0.600		0.7600	0.42	0.02125	0.268
Ba	mg/L	2		0.1900	0.048	0.00500	0.032
Be	mg/L	8.0E-05		0.0002	1.19E-04	0.00010	0.00011
Ca	mg/L	--		540.00	167.3	24.35	113.012
Cd	mg/L	0.004		0.0002	2.3E-04	0.00010	0.000
Cl	mg/L	--	250.00	67.4455	126.41	1.21	77.590
Co	mg/L	--		0.0520	8.75E-05	0.00050	0.000
Cu	mg/L	1.3	1.00	0.09	0.0010	0.00680	0.004
F	mg/L	4	2.00	0.0622	0.61	0.13	0.419
Fe	mg/L	--	0.30	0.8100	0.00028	0.202	0.081
Hardness	mg/L	--		1,729.35	561.6	77.3	377.394
K	mg/L	--		49.0000	29.89	1.365	18.871
Mg	mg/L	--		93.00	34.96	3.98	23.122
Mn	mg/L	--	0.05	0.7500	0.000	0.039	0.018
Na	mg/L	--		453.53	1108.94	8.64	679.413
Ni	mg/L	0.100		0.86	0.00075	0.001	0.004
Pb	mg/L	0.015		0.0267	0.0131	0.00050	0.008
Sb	mg/L	0.006		0.0800	0.0126	0.0015	0.009
Se	mg/L	0.030		0.0029	0.035	0.0001	0.021
SO ₄	mg/L	--	250.00	2,340.00	334.6	13.6	216.565
Tl	mg/L	6E-04		0.0000	0.00001	0.001	0.000
V	mg/L	0.050		0.19	0.056	0.00	0.035
Zn	mg/L	2	5.00	0.0900	0.029	0.00875	0.021



Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge concentrations are average groundwater quality data from MW-05-2 with non-detects set at 1/2 the detection limit

Background concentrations are predicted East Pit concentrations during West Pit Filling

**Table 8-12. Predicted Groundwater Concentrations - Screening Level Model - Mine Site RA1,
Category 2/3 Stockpile Flow Path - Average Liner Leakage**

Source Proportional Contribution

	Surficial Deposits
	Partridge River
Category 2/3	5.453E-03
Recharge	0.3881
Up-Gradient (East Pit)	0.6064

							Surficial Deposits
Parameter	Units	GW Standard	EPA sMCL	Cat 2/3 Predicted Concentrations After West Pit Flooding	East Pit Predicted Concentrations During West Pit Flooding (Background)	Recharge concentration	Predicted concentration, Partridge River
Ag	mg/L	0.030	0.10	0.0007	0.00029	0.00075	0.000
Al	mg/L	--	0.05	1.6800	0.037	0.1768	0.100
As	mg/L	0.010		0.7100	0.0148	0.00210	0.014
B	mg/L	0.600		0.7600	0.37	0.02125	0.235
Ba	mg/L	2		0.1900	0.040	0.00500	0.027
Be	mg/L	8.0E-05		0.0002	9.88E-05	0.00010	0.0001
Ca	mg/L	--		540.00	144.9	24.35	100.246
Cd	mg/L	0.004		0.0002	1.88E-04	0.00010	0.000
Cl	mg/L	--	250.00	97.2008	107.88	1.21	66.423
Co	mg/L	--		0.0520	7.28E-05	0.00050	0.001
Cu	mg/L	1.3	1.00	0.09	0.0014	0.00680	0.004
F	mg/L	4	2.00	0.0621	0.53	0.13	0.371
Fe	mg/L	--	0.30	0.8100	0.54	0.202	0.410
Hardness	mg/L	--		1,729.35	503.6	77.3	344.837
K	mg/L	--		49.0000	25.31	1.365	16.146
Mg	mg/L	--		93.00	31.74	3.98	21.300
Mn	mg/L	--	0.05	0.7500	0.05	0.039	0.050
Na	mg/L	--		651.55	924.26	8.64	567.421
Ni	mg/L	0.100		0.86	0.00062	0.001	0.005
Pb	mg/L	0.015		0.0385	0.0111	0.00050	0.007
Sb	mg/L	0.006		0.0800	0.0110	0.0015	0.008
Se	mg/L	0.030		0.0029	0.029	0.0001	0.018
SO ₄	mg/L	--	250.00	2,340.00	281.56	13.6	188.792
TI	mg/L	6E-04		0.0000	0.00014	0.001	0.000
V	mg/L	0.050		0.19	0.047	0.00	0.029
Zn	mg/L	2	5.00	0.0900	0.029	0.00875	0.022



Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge concentrations are average groundwater quality data from MW-05-2 with non-detects set at 1/2 the detection limit

Background concentrations are predicted East Pit concentrations during West Pit Filling

Table 8-13. Predicted Groundwater Concentrations - Screening Level Model - Mine Site RA1, Category 2/3 Stockpile Flow Path - High Liner Leakage

Source Proportional Contribution

	Surficial Deposits
	Partridge River
Category 2/3	2.809E-02
Recharge	0.3847
Up-Gradient (East Pit)	0.5872

Parameter	Units	GW Standard	EPA sMCL	Cat 2/3 Predicted Concentrations After West Pit Flooding	East Pit Predicted Concentrations During West Pit Flooding (Background)	Recharge concentration	Surficial Deposits
							Predicted concentration, Partridge River
Ag	mg/L	0.030	0.10	0.0007	0.00020	0.00075	0.000
Al	mg/L	--	0.05	1.6800	0.046	0.1768	0.142
As	mg/L	0.010		0.7100	0.0100	0.00210	0.027
B	mg/L	0.600		0.7600	0.26	0.02125	0.182
Ba	mg/L	2		0.1900	0.027	0.00500	0.023
Be	mg/L	8.0E-05		0.0002	6.67E-05	0.00010	0.0001
Ca	mg/L	--		540.00	102.6	24.35	84.773
Cd	mg/L	0.004		0.0002	1.27E-04	0.00010	0.000
Cl	mg/L	--	250.00	210.9465	75.1	1.21	50.477
Co	mg/L	--		0.0520	4.92E-05	0.00050	0.002
Cu	mg/L	1.3	1.00	0.09	0.0014	0.00680	0.006
F	mg/L	4	2.00	0.0621	0.38	0.13	0.273
Fe	mg/L	--	0.30	0.8100	0.85	0.202	0.598
Hardness	mg/L	--		1,729.35	371.0	77.3	296.170
K	mg/L	--		49.0000	17.45	1.365	12.149
Mg	mg/L	--		93.00	23.68	3.98	18.046
Mn	mg/L	--	0.05	0.7500	0.08	0.039	0.083
Na	mg/L	--		681.00	624.6	8.64	389.197
Ni	mg/L	0.100		0.86	0.00042	0.001	0.025
Pb	mg/L	0.015		0.0528	0.0076	0.00050	0.006
Sb	mg/L	0.006		0.0800	0.0079	0.0015	0.007
Se	mg/L	0.030		0.0029	0.020	0.0001	0.012
SO ₄	mg/L	--	250.00	2,340.00	192.6	13.6	184.053
Tl	mg/L	6E-04		0.0000	0.00022	0.001	0.00051
V	mg/L	0.050		0.19	0.032	0.00	0.024
Zn	mg/L	2	5.00	0.0900	0.024	0.00875	0.020

Groundwater criteria exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge concentrations are average groundwater quality data from MW-05-2 with non-detects set at 1/2 the detection limit

Background concentrations are predicted East Pit concentrations during West Pit Filling

**Table 8-14. Predicted Groundwater Concentrations - Screening Level Model - Mine Site RA1
Category 3 Lean Ore Stockpile Flow Path - Low Liner Leakage**

Source Proportional Contribution

	Surficial Deposits Partridge River
Category 3 Lean Ore	1.696E-04
Recharge/Background	0.9998

						Surficial Deposits
Parameter	Units	GW Standard	EPA sMCL	Cat 3 LO Predicted Concentrations After West Pit Flooding	Recharge/ background concentration	Predicted concentration, Partridge River
Ag	mg/L	0.030	0.10	0.0007	0.00075	0.001
Al	mg/L	--	0.05	1.6800	0.1768	0.177
As	mg/L	0.010	--	0.7100	0.00210	0.002
B	mg/L	0.600	--	0.7600	0.02125	0.021
Ba	mg/L	2	--	0.1900	0.00500	0.005
Be	mg/L	8.0E-05	--	0.0002	0.00010	0.00010
Ca	mg/L	--	--	540.00	24.35	24.437
Cd	mg/L	0.004	--	0.0002	0.00010	0.00010
Cl	mg/L	--	250.00	67.4455	1.21	1.221
Co	mg/L	--	--	0.0520	0.00050	0.001
Cu	mg/L	1.3	1.00	0.09	0.00680	0.007
F	mg/L	4	2.00	0.0622	0.13	0.130
Fe	mg/L	--	0.30	0.8100	0.202	0.202
Hardness	mg/L	--	--	1,729.35	77.3	77.580
K	mg/L	--	--	49.0000	1.365	1.373
Mg	mg/L	--	--	93.00	3.98	3.995
Mn	mg/L	--	0.05	0.7500	0.039	0.039
Na	mg/L	--	--	453.53	8.64	8.715
Ni	mg/L	0.100	--	0.03	0.001	0.001
Pb	mg/L	0.015	--	0.2000	0.00050	0.001
Sb	mg/L	0.006	--	0.0800	0.0015	0.002
Se	mg/L	0.030	--	0.0029	0.0001	0.000
SO ₄	mg/L	--	250.00	2,340.00	13.6	13.995
Tl	mg/L	6E-04	--	0.0000	0.001	0.001
V	mg/L	0.050	--	0.19	0.00	0.000
Zn	mg/L	2	5.00	0.0900	0.00875	0.009

Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge/background concentrations are average groundwater quality data from MW-05-2 with non-detects set at 1/2 the detection limit

**Table 8-15. Predicted Groundwater Concentrations - Screening Level Model - Mine Site RA1
Category 3 Lean Ore Stockpile Flow Path - Average Liner Leakage**

Source Proportional Contribution

	Surficial Deposits
	Partridge River
Category 3 Lean Ore	2.773E-04
Recharge/Background	0.9997

						Surficial Deposits
Parameter	Units	GW Standard	EPA sMCL	Cat 3 LO Predicted Concentrations After West Pit Flooding	Recharge/background concentration	Predicted concentration, Partridge River
Ag	mg/L	0.030	0.10	0.0007	0.00075	0.001
Al	mg/L	--	0.05	1.6800	0.1768	0.177
As	mg/L	0.010	--	0.7100	0.00210	0.002
B	mg/L	0.600	--	0.7600	0.02125	0.021
Ba	mg/L	2	--	0.1900	0.00500	0.005
Be	mg/L	8.0E-05	--	0.0002	0.00010	0.00010
Ca	mg/L	--	--	540.0000	24.35	24.493
Cd	mg/L	0.004	--	0.0002	0.00010	0.00010
Cl	mg/L	--	250.00	98.3723	1.21	1.237
Co	mg/L	--	--	0.0520	0.00050	0.001
Cu	mg/L	1.3	1.00	0.0920	0.00680	0.007
F	mg/L	4	2.00	0.0621	0.13	0.130
Fe	mg/L	--	0.30	0.8100	0.202	0.202
Hardness	mg/L	--	--	1,729.3495	77.3	77.758
K	mg/L	--	--	49.0000	1.365	1.378
Mg	mg/L	--	--	93.0000	3.98	4.005
Mn	mg/L	--	0.05	0.7500	0.039	0.039
Na	mg/L	--	--	681.0000	8.64	8.826
Ni	mg/L	0.100	--	0.0508	0.001	0.001
Pb	mg/L	0.015	--	0.2000	0.00050	0.001
Sb	mg/L	0.006	--	0.0800	0.0015	0.002
Se	mg/L	0.030	--	0.0029	0.0001	0.000
SO ₄	mg/L	--	250.00	2,340.0000	13.6	14.245
Tl	mg/L	6E-04	--	0.0000	0.001	0.001
V	mg/L	0.050	--	0.1900	0.00	0.000
Zn	mg/L	2	5.00	0.0900	0.00875	0.009

 Groundwater standard exceedance

 EPA sMCL exceedance

-- No applicable standard

Recharge/background concentrations are average groundwater quality data from MW-05-2 with non-detects set at 1/2 the detection limit

**Table 8-16. Predicted Groundwater Concentrations - Screening Level Model - Mine Site RA1
Category 3 Lean Ore Stockpile Flow Path - High Liner Leakage**

Source Proportional Contribution

	Surficial Deposits Partridge River
Category 3 Lean Ore	7.824E-03
Recharge/Background	0.9922

						Surficial Deposits
Parameter	Units	GW Standard	EPA sMCL	Cat 3 LO Predicted Concentrations After West Pit Flooding	Recharge/ background concentration	Predicted concentration, Partridge River
Ag	mg/L	0.030	0.10	0.0007	0.00075	0.001
Al	mg/L	--	0.05	1.6800	0.1768	0.189
As	mg/L	0.010	--	0.7100	0.00210	0.008
B	mg/L	0.600	--	0.7600	0.02125	0.027
Ba	mg/L	2	--	0.1900	0.00500	0.006
Be	mg/L	8.0E-05	--	0.0002	0.00010	0.0001
Ca	mg/L	--	--	540.00	24.35	28.384
Cd	mg/L	0.004	--	0.0002	0.00010	0.000
Cl	mg/L	--	250.00	213.4889	1.21	2.871
Co	mg/L	--	--	0.0520	0.00050	0.001
Cu	mg/L	1.3	1.00	0.09	0.00680	0.007
F	mg/L	4	2.00	0.0621	0.13	0.129
Fe	mg/L	--	0.30	0.8100	0.202	0.207
Hardness	mg/L	--	--	1,729.35	77.3	90.226
K	mg/L	--	--	49.0000	1.365	1.738
Mg	mg/L	--	--	93.00	3.98	4.676
Mn	mg/L	--	0.05	0.7500	0.039	0.044
Na	mg/L	--	--	681.00	8.64	13.901
Ni	mg/L	0.100	--	0.05	0.001	0.001
Pb	mg/L	0.015	--	0.2000	0.00050	0.002
Sb	mg/L	0.006	--	0.0800	0.0015	0.002
Se	mg/L	0.030	--	0.0029	0.0001	0.000
SO ₄	mg/L	--	250.00	2,340.00	13.6	31.802
Tl	mg/L	6E-04	--	0.0000	0.001	0.001
V	mg/L	0.050	--	0.19	0.00	0.001
Zn	mg/L	2	5.00	0.0900	0.00875	0.009

Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge/background concentrations are average groundwater quality data from MW-05-2 with non-detects set at 1/2 the detection limit

**Table 8-17. Predicted Groundwater Concentrations - Screening Level Model - Mine Site RA1
Lean Ore Surge Pile Flow Path - Low Liner Leakage**

Source Area Proportional Contributions

	Surficial Deposits
	Partridge River/ Property Boundary
Lean Ore Surge Pile	7.71E-05
Recharge	0.6143
Background	0.3856

Parameter	Units	GW Standard	EPA sMCL	Lean Ore Surge Pile Predicted Concentrations Post Closure	Recharge/ background concentration, surficial deposits	Surficial Deposits
						Predicted concentration, Partridge River/property boundary
Ag	mg/L	0.030	0.10	0.0007	0.00075	0.001
Al	mg/L	--	0.05	83.0000	0.1768	0.183
As	mg/L	0.010	--	0.1011	0.00210	0.0021
B	mg/L	0.600	--	0.7600	0.02125	0.0213
Ba	mg/L	2	--	0.1900	0.00500	0.0050
Be	mg/L	8.0E-05	--	0.0023	0.00010	1.00E-04
Ca	mg/L	--	--	461.98	24.35	24.4
Cd	mg/L	0.004	--	0.0149	0.00010	0.0001
Cl	mg/L	--	250.00	1.1097	1.21	1.2
Co	mg/L	--	--	5.5768	0.00050	0.001
Cu	mg/L	1.3	1.00	1.34	0.00680	0.007
F	mg/L	4	2.00	0.0630	0.13	0.130
Fe	mg/L	--	0.30	235.0000	0.202	0.220
Hardness	mg/L	--	--	4,012.20	77.3	77.6
K	mg/L	--	--	38.0000	1.365	1.4
Mg	mg/L	--	--	695.01	3.98	4.0
Mn	mg/L	--	0.05	14.2736	0.039	0.040
Na	mg/L	--	--	87.21	8.64	8.6
Ni	mg/L	0.100	--	0.05	0.001	0.001
Pb	mg/L	0.015	--	0.2000	0.00050	0.001
Sb	mg/L	0.006	--	0.0420	0.0015	0.0015
Se	mg/L	0.030	--	0.0029	0.0001	0.0001
SO ₄	mg/L	--	250.00	8,920.24	13.6	14.3
Tl	mg/L	6E-04	--	0.0001	0.001	0.001
V	mg/L	0.050	--	0.19	0.00	0.0000
Zn	mg/L	2	5.00	26.0000	0.00875	0.011

Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge/background concentrations are average groundwater quality data from MW-05-2 with non-detects set at 1/2 the detection limit

**Table 8-18. Predicted Groundwater Concentrations - Screening Level Model - Mine Site RA1
Lean Ore Surge Pile Flow Path - Average Liner Leakage**

Source Area Proportional Contributions

	Surficial Deposits Partridge River/ Property Boundary
Lean Ore Surge Pile	1.26E-04
Recharge	0.6148
Background	0.3851

Parameter	Units	GW Standard	EPA sMCL	Lean Ore Surge Pile Predicted Concentrations Post Closure	Recharge/ background concentration, surficial deposits	Surficial Deposits Predicted concentration, Partridge River/property boundary
Ag	mg/L	0.030	0.10	0.0007	0.00075	0.001
Al	mg/L	--	0.05	83.0000	0.1768	0.187
As	mg/L	0.010	--	0.1452	0.00210	0.0021
B	mg/L	0.600	--	0.7600	0.02125	0.0213
Ba	mg/L	2	--	0.1900	0.00500	0.0050
Be	mg/L	8.0E-05	--	0.0023	0.00010	1.00E-04
Ca	mg/L	--	--	480.00	24.35	24.4
Cd	mg/L	0.004	--	0.0149	0.00010	0.0001
Cl	mg/L	--	250.00	1.5943	1.21	1.2
Co	mg/L	--	--	8.0117	0.00050	0.002
Cu	mg/L	1.3	1.00	1.93	0.00680	0.007
F	mg/L	4	2.00	0.0630	0.13	0.130
Fe	mg/L	--	0.30	235.0000	0.202	0.232
Hardness	mg/L	--	--	5,305.93	77.3	78.0
K	mg/L	--	--	38.0000	1.365	1.4
Mg	mg/L	--	--	998.47	3.98	4.1
Mn	mg/L	--	0.05	20.5058	0.039	0.041
Na	mg/L	--	--	125.28	8.64	8.7
Ni	mg/L	0.100	--	0.05	0.001	0.001
Pb	mg/L	0.015	--	0.2000	0.00050	0.001
Sb	mg/L	0.006	--	0.0603	0.0015	0.0015
Se	mg/L	0.030	--	0.0029	0.0001	0.0001
SO ₄	mg/L	--	250.00	9,600.00	13.6	14.8
Tl	mg/L	6E-04	--	0.0001	0.001	0.001
V	mg/L	0.050	--	0.19	0.00	0.0000
Zn	mg/L	2	5.00	26.0000	0.00875	0.012

Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge/background concentrations are average groundwater quality data from MW-05-2 with non-detects set at 1/2 the detection limit

**Table 8-19. Predicted Groundwater Concentrations - Screening Level Model - Mine Site RA1
Lean Ore Surge Pile Flow Path - High Liner Leakage**

Source Area Proportional Contributions

	Surficial Deposits Partridge River/ Property Boundary
Lean Ore Surge Pile	3.56E-03
Recharge	0.6144
Background	0.3820

Parameter	Units	GW Standard	EPA sMCL	Lean Ore Surge Pile Predicted Concentrations Post Closure	Recharge/ background concentration, surficial deposits	Surficial Deposits Predicted concentration, Partridge River/property boundary
Ag	mg/L	0.030	0.10	0.0007	0.00075	0.001
Al	mg/L	--	0.05	83.0000	0.1768	0.472
As	mg/L	0.010	--	0.2514	0.00210	0.0030
B	mg/L	0.600	--	0.7600	0.02125	0.0239
Ba	mg/L	2	--	0.1900	0.00500	0.0057
Be	mg/L	8.0E-05	--	0.0023	0.00010	1.08E-04
Ca	mg/L	--	--	480.00	24.35	26.0
Cd	mg/L	0.004	--	0.0149	0.00010	0.0002
Cl	mg/L	--	250.00	2.7608	1.21	1.2
Co	mg/L	--	--	13.8740	0.00050	0.050
Cu	mg/L	1.3	1.00	3.34	0.00680	0.019
F	mg/L	4	2.00	0.0630	0.13	0.130
Fe	mg/L	--	0.30	235.0000	0.202	1.039
Hardness	mg/L	--	--	5,435.69	77.3	96.4
K	mg/L	--	--	38.0000	1.365	1.5
Mg	mg/L	--	--	1,030.00	3.98	7.6
Mn	mg/L	--	0.05	35.5100	0.039	0.165
Na	mg/L	--	--	216.96	8.64	9.4
Ni	mg/L	0.100	--	0.05	0.001	0.001
Pb	mg/L	0.015	--	0.2000	0.00050	0.001
Sb	mg/L	0.006	--	0.0800	0.0015	0.0018
Se	mg/L	0.030	--	0.0029	0.0001	0.0001
SO ₄	mg/L	--	250.00	9,600.00	13.6	47.8
Tl	mg/L	6E-04	--	0.0001	0.001	0.001
V	mg/L	0.050	--	0.19	0.00	0.0007
Zn	mg/L	2	5.00	26.0000	0.00875	0.101

Groundwater standard exceedance

EPA sMCL exceedance

-- No applicable standard

Recharge/background concentrations are average groundwater quality data from MW-05-2 with non-detects set at 1/2 the detection limit

Table 8-20. Summary of Potential Groundwater Criteria Exceedances in Either Bedrock or the Surficial Aquifer Using Screening Level Models – Mine Site RA1

Model	Potential Groundwater Exceedances
Category 1 – Overburden Stockpile	As, Ni, Sb, SO ₄ , <u>Al</u> , <u>Fe</u> , <u>Mn</u>
West Pit	As, Sb, <u>Al</u> , <u>Fe</u> , <u>Mn</u>
East Pit and Category 4 Waste Rock Stockpile	Fe, <u>Al</u>
Category 2/3 Waste Rock Stockpile	As, Fe, Mn, Sb, <u>Al</u>
Category 3 Lean Ore Stockpile	<u>Al</u>
Lean Ore Surge Pile	Fe, Mn, <u>Al</u>

NOTE: Background concentrations of the parameters in italics and underlined exceed criteria

Table 8-21. Source concentrations used in transient groundwater quality models with low liner leakage - Mine Site RA1

Model	Source	Parameter	Mine Year 5 (mg/L)	Mine Year 10 (mg/L)	Mine Year 15 (mg/L)	Mine Year 20 (mg/L)	Closure (mg/L)	Post-Closure (mg/L)
Category 1 - Overburden Stockpile Model	Category 1 Stockpile	As	0.046	0.092	0.16	0.16	0.16	0.16
	Overburden portion of Stockpile	As	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027
	Background/Recharge	As	0.00283	0.00283	0.00283	0.00283	0.00283	0.00283
	Category 1 Stockpile	Ni	0.045	0.091	0.15	0.15	0.15	0.15
	Overburden portion of Stockpile	Ni	0.019	0.019	0.019	0.019	0.019	0.019
	Background/Recharge	Ni	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057
	Category 1 Stockpile	Sb	0.08	0.08	0.08	0.08	0.08	0.08
	Overburden portion of Stockpile	Sb	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
	Background/Recharge	Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
	Category 1 Stockpile	SO ₄	175	353	593	593	593	593
West Pit Model	Overburden portion of Stockpile	SO ₄	68.3	68.3	68.3	68.3	68.3	68.3
	Background/Recharge	SO ₄	17.57	17.57	17.57	17.57	17.57	17.57
	West Pit	As	--	--	--	--	--	0.090
	Background/Recharge	As	--	--	--	--	--	0.0028
	West Pit	Sb	--	--	--	--	--	0.11
	Background/Recharge	Sb	--	--	--	--	--	0.0015
East Pit and Category 4 Stockpile Model	West Pit	SO ₄	--	--	--	--	--	270.9
	Background/Recharge	SO ₄	--	--	--	--	--	17.57
	Category 4 Stockpile	Fe	0.81	0.81	0.81	0.81	0.202	0.202
	East Pit/Upgradient Source (Overburden)	Fe	0.202	0.202	0.202	0.202	0.83	0.00028
	East Pit/Upgradient Source (Bedrock)	Fe	1.36	1.36	1.36	1.36	0.81	0.81
	Background/Recharge	Fe	0.202	0.202	0.202	0.202	0.202	0.202
	Category 4 Stockpile	SO ₄	2340	2340	2340	2340	13.6	13.6
	East Pit/Upgradient Source (Overburden)	SO ₄	13.6	13.6	13.6	13.6	334.6	334.6
Category 2/3 Stockpile Model	East Pit/Upgradient Source (Bedrock)	SO ₄	16.8	16.8	16.8	16.8	2340	2340
	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6
	Category 2/3 Stockpile	As	0.71	0.71	0.71	0.23	0.23	0.71
	East Pit/Upgradient Source	As	0.0021	0.0021	0.0021	0.0021	0.018	0.018
	Background/Recharge	As	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021
	Category 2/3 Stockpile	Fe	0.81	0.81	0.81	0.81	0.81	0.81
	East Pit/Upgradient Source	Fe	0.202	0.202	0.202	0.202	0.83	0.00028
	Background/Recharge	Fe	0.202	0.202	0.202	0.202	0.202	0.202
	Category 2/3 Stockpile	Mn	0.75	0.75	0.75	0.52	0.52	0.52
	East Pit/Upgradient Source	Mn	0.039	0.039	0.039	0.039	0.078	0.00020
	Background/Recharge	Mn	0.039	0.039	0.039	0.039	0.039	0.039
	Category 2/3 Stockpile	Sb	0.080	0.080	0.080	0.080	0.080	0.080
Category 3 Lean Ore Stockpile Model	East Pit/Upgradient Source	Sb	0.0015	0.0015	0.0015	0.0015	0.013	0.013
	Background/Recharge	Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Lean Ore Surge Pile Model	Category 2/3 Stockpile	SO ₄	1659	2340	2340	864	864	2340
	East Pit/Upgradient Source	SO ₄	13.6	13.6	13.6	13.6	334.6	334.6
	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6
	Lean Ore Surge Pile	Fe	235	235	235	235	0.202	0.202
	Background/Recharge	Fe	0.202	0.202	0.202	0.202	0.202	0.202
	Lean Ore Surge Pile	Mn	3.7	5.3	14.3	11.5	0.039	0.039
	Background/Recharge	Mn	0.039	0.039	0.039	0.039	0.039	0.039
	Lean Ore Surge Pile	SO ₄	2312	3327	8920	7161	13.6	13.6
	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6

Table 8-22. Source concentrations used in transient groundwater quality models with average liner leakage - Mine Site RA1

Model	Source	Parameter	Mine Year 5 (mg/L)	Mine Year 10 (mg/L)	Mine Year 15 (mg/L)	Mine Year 20 (mg/L)	Closure (mg/L)	Post-Closure (mg/L)
Category 1 - Overburden Stockpile Model	Category 1 Stockpile	As	0.066	0.13	0.22	0.22	0.22	0.22
	Overburden portion of Stockpile	As	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027
	Background/Recharge	As	0.00283	0.00283	0.00283	0.00283	0.00283	0.00283
	Category 1 Stockpile	Ni	0.065	0.13	0.22	0.22	0.22	0.22
	Overburden portion of Stockpile	Ni	0.019	0.019	0.019	0.019	0.019	0.019
	Background/Recharge	Ni	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057
	Category 1 Stockpile	Sb	0.08	0.08	0.08	0.08	0.08	0.08
	Overburden portion of Stockpile	Sb	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
	Background/Recharge	Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
	Category 1 Stockpile	SO ₄	252	507	854	854	854	854
West Pit Model	Overburden portion of Stockpile	SO ₄	68.3	68.3	68.3	68.3	68.3	68.3
	Background/Recharge	SO ₄	17.57	17.57	17.57	17.57	17.57	17.57
	West Pit	As	--	--	--	--	--	0.096
	Background/Recharge	As	--	--	--	--	--	0.0028
	West Pit	Sb	--	--	--	--	--	0.096
	Background/Recharge	Sb	--	--	--	--	--	0.0015
East Pit and Category 4 Stockpile Model	West Pit	SO ₄	--	--	--	--	--	219.0
	Background/Recharge	SO ₄	--	--	--	--	--	17.57
	Category 4 Stockpile	Fe	0.81	0.81	0.81	0.81	0.202	0.202
	East Pit/Upgradient Source (Overburden)	Fe	0.202	0.202	0.202	0.202	0.54	0.54
	East Pit/Upgradient Source (Bedrock)	Fe	1.36	1.36	1.36	1.36	0.81	0.81
	Background/Recharge	Fe	0.202	0.202	0.202	0.202	0.202	0.202
	Category 4 Stockpile	SO ₄	2340	2340	2340	2340	13.6	13.6
Category 2/3 Stockpile Model	East Pit/Upgradient Source (Overburden)	SO ₄	13.6	13.6	13.6	13.6	344.9	281.6
	East Pit/Upgradient Source (Bedrock)	SO ₄	16.8	16.8	16.8	16.8	2340	2340
	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6
	Category 2/3 Stockpile	As	0.71	0.71	0.71	0.33	0.33	0.71
	East Pit/Upgradient Source	As	0.0021	0.0021	0.0021	0.0021	0.016	0.015
	Background/Recharge	As	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021
	Category 2/3 Stockpile	Fe	0.81	0.81	0.81	0.81	0.81	0.81
	East Pit/Upgradient Source	Fe	0.202	0.202	0.202	0.202	0.54	0.54
	Background/Recharge	Fe	0.202	0.202	0.202	0.202	0.202	0.202
	Category 2/3 Stockpile	Mn	0.75	0.75	0.75	0.75	0.74	0.74
	East Pit/Upgradient Source	Mn	0.039	0.039	0.039	0.039	0.051	0.051
	Background/Recharge	Mn	0.039	0.039	0.039	0.039	0.039	0.039
Category 3 Lean Ore Stockpile Model	Category 2/3 Stockpile	Sb	0.080	0.080	0.080	0.080	0.080	0.080
	East Pit/Upgradient Source	Sb	0.0015	0.0015	0.0015	0.0015	0.012	0.011
Lean Ore Surge Pile Model	Background/Recharge	Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
	Category 2/3 Stockpile	SO ₄	2340	2340	2340	1245	1245	2340
	East Pit/Upgradient Source	SO ₄	13.6	13.6	13.6	13.6	344.9	281.6
	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6
	Category 3 Lean Ore Stockpile	SO ₄	2340	2340	516	1643	1643	2340
	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6
Lean Ore Surge Pile Model	Lean Ore Surge Pile	Fe	235	235	235	235	0.202	0.202
	Background/Recharge	Fe	0.202	0.202	0.202	0.202	0.202	0.202
	Lean Ore Surge Pile	Mn	5.3	7.6	20.5	16.5	0.039	0.039
	Background/Recharge	Mn	0.039	0.039	0.039	0.039	0.039	0.039
	Lean Ore Surge Pile	SO ₄	3321	4780	9600	9600	13.6	13.6
	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6

Table 8-23. Source concentrations used in transient groundwater quality models with high liner leakage - Mine Site RA1

Model	Source	Parameter	Mine Year 5 (mg/L)	Mine Year 10 (mg/L)	Mine Year 15 (mg/L)	Mine Year 20 (mg/L)	Closure (mg/L)	Post-Closure (mg/L)
Category 1 - Overburden Stockpile Model	Category 1 Stockpile	As	0.029	0.12	0.25	0.49	0.49	0.49
	Overburden portion of Stockpile	As	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027
	Background/Recharge	As	0.00283	0.00283	0.00283	0.00283	0.00283	0.00283
	Category 1 Stockpile	Ni	0.12	0.25	0.48	0.48	0.48	0.48
	Overburden portion of Stockpile	Ni	0.019	0.019	0.019	0.019	0.019	0.019
	Background/Recharge	Ni	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057
	Category 1 Stockpile	Sb	0.08	0.08	0.08	0.08	0.08	0.08
	Overburden portion of Stockpile	Sb	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
	Background/Recharge	Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
	Category 1 Stockpile	SO ₄	453	968	1854	1854	1854	1854
	Overburden portion of Stockpile	SO ₄	68.3	68.3	68.3	68.3	68.3	68.3
	Background/Recharge	SO ₄	17.57	17.57	17.57	17.57	17.57	17.57
West Pit Model	West Pit	As	--	--	--	--	--	0.19
	Background/Recharge	As	--	--	--	--	--	0.0028
	West Pit	Sb	--	--	--	--	--	0.092
	Background/Recharge	Sb	--	--	--	--	--	0.0015
	West Pit	SO ₄	--	--	--	--	--	233.2
	Background/Recharge	SO ₄	--	--	--	--	--	17.57
East Pit and Category 4 Stockpile Model	Category 4 Stockpile	Fe	0.81	0.81	0.81	0.81	0.202	0.202
	East Pit/Upgradient Source (Overburden)	Fe	0.202	0.202	0.202	0.202	0.85	0.85
	East Pit/Upgradient Source (Bedrock)	Fe	1.36	1.36	1.36	1.36	0.81	0.81
	Background/Recharge	Fe	0.202	0.202	0.202	0.202	0.202	0.202
	Category 4 Stockpile	SO ₄	2340	2340	2340	2340	13.6	13.6
	East Pit/Upgradient Source (Overburden)	SO ₄	13.6	13.6	13.6	13.6	302.7	192.6
	East Pit/Upgradient Source (Bedrock)	SO ₄	16.8	16.8	16.8	16.8	2340	2340
	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6
Category 2/3 Stockpile Model	Category 2/3 Stockpile	As	0.71	0.71	0.71	0.71	0.71	0.71
	East Pit/Upgradient Source	As	0.0021	0.0021	0.0021	0.0021	0.012	0.010
	Background/Recharge	As	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021
	Category 2/3 Stockpile	Fe	0.81	0.81	0.81	0.81	0.81	0.81
	East Pit/Upgradient Source	Fe	0.202	0.202	0.202	0.202	0.85	0.85
	Background/Recharge	Fe	0.202	0.202	0.202	0.202	0.202	0.202
	Category 2/3 Stockpile	Mn	0.75	0.75	0.75	0.75	0.75	0.75
	East Pit/Upgradient Source	Mn	0.039	0.039	0.039	0.039	0.080	0.079
	Background/Recharge	Mn	0.039	0.039	0.039	0.039	0.039	0.039
	Category 2/3 Stockpile	Sb	0.080	0.080	0.080	0.080	0.080	0.080
	East Pit/Upgradient Source	Sb	0.0015	0.0015	0.0015	0.0015	0.0094	0.0079
	Background/Recharge	Sb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
	Category 2/3 Stockpile	SO ₄	2340	2340	2340	2340	2340	2340
	East Pit/Upgradient Source	SO ₄	13.6	13.6	13.6	13.6	302.7	192.6
	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6
Category 3 Lean Ore Stockpile Model	Category 3 Lean Ore Stockpile	SO ₄	2340	2340	912	2340	2340	2340
	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6
Lean Ore Surge Pile Model	Lean Ore Surge Pile	Fe	235	235	235	235	0.202	0.202
	Background/Recharge	Fe	0.202	0.202	0.202	0.202	0.202	0.202
	Lean Ore Surge Pile	Mn	9.2	13.2	35.5	28.5	0.039	0.039
	Background/Recharge	Mn	0.039	0.039	0.039	0.039	0.039	0.039
	Lean Ore Surge Pile	SO ₄	5752	8278	9600	9600	13.6	13.6
	Background/Recharge	SO ₄	13.6	13.6	13.6	13.6	13.6	13.6

Table 8-24. Summary of maximum concentration data predicted using the transient groundwater quality models with low liner leakage - Mine Site RA1

	Years 1-76		Years 77-2000		Final Concentration (mg/L)
	Maximum Concentration	Time of Max	Maximum Concentration	Time of Max	
	(mg/L)	(Year)	(mg/L)	(Year)	
Category 1 - Overburden Stockpile					
Arsenic					
No Sorption	0.0028	1-76	0.0250	250-2000	0.025
With Sorption	0.0028	1-76	0.0028	77-2000	0.0028
Nickel					
No Sorption	0.0077	76	0.032	300-2000	0.032
With Sorption	0.0057	1-76	0.0057	77-2000	0.0057
Antimony					
No Sorption	0.0015	1-63	0.012	200-2000	0.012
With Sorption	0.0015	1-76	0.0015	77-2000	0.0015
Sulfate					
No Sorption	25.4	76	119.8	380-2000	119.8
West Pit					
Arsenic					
No Sorption	---	---	0.038	438-2000	0.038
With Sorption	---	---	0.0028	77-2000	0.0028
Antimony					
No Sorption	---	---	0.046	560-2000	0.046
With Sorption	---	---	0.0015	77-2000	0.0015
Sulfate					
No Sorption	---	---	120.3	1300-2000	120.3
East Pit and Category 4 Stockpile					
Iron					
No Sorption	0.27	1-7	0.27	129-132	0.19
Sulfate					
No Sorption	15.8	76	45.3	129	30.4
Category 2/3 Stockpile					
Arsenic					
No Sorption	0.0028	71-76	0.013	0.013	164-2000
With Sorption	0.0021	1-76	0.0021	76-2000	0.0021
Iron					
No Sorption	0.20	1-76	0.49	142-148	0.080
Manganese					
No Sorption	0.040	41-76	0.057	143-146	0.016
Antimony					
No Sorption	0.0017	76	0.0086	187-2000	0.0086
With Sorption	0.0015	1-76	0.0015	76-2000	0.0015
Sulfate					
No Sorption	16.9	76	212.9	205-2000	212.9
Category 3 Lean Ore Stockpile					
Sulfate					
No Sorption	13.8	76	13.8	76-2000	13.8
Lean Ore Surge Pile					
Iron					
No Sorption	0.21	43-76	0.21	76-85	0.20
Manganese					
No Sorption	0.039	1-76	0.039	76-2000	0.039
Sulfate					
No Sorption	13.8	52-76	13.8	76-78	13.6

Table 8-25. Summary of maximum concentration data predicted using the transient groundwater quality models with average liner leakage - Mine Site RA1

	Years 1-66		Years 67-2000		Final Concentration (mg/L)
	Maximum Concentration	Time of Max	Maximum Concentration	Time of Max	
	(mg/L)	(Year)	(mg/L)	(Year)	
Category 1 - Overburden Stockpile					
Arsenic					
No Sorption	0.0033	66	0.046	330-2000	0.046
With Sorption	0.0028	1-66	0.0028	67-2000	0.0028
Nickel					
No Sorption	0.013	66	0.055	208-2000	0.0550
With Sorption	0.0057	1-66	0.0057	67-2000	0.0057
Antimony					
No Sorption	0.0015	1-66	0.016	166-2000	0.016
With Sorption	0.0015	1-66	0.0015	67-2000	0.0015
Sulfate					
No Sorption	44.7	66	211.2	400-2000	211.2
West Pit					
Arsenic					
No Sorption	---	---	0.041	517-2000	0.041
With Sorption	---	---	0.0028	67-2000	0.0028
Antimony					
No Sorption	---	---	0.040	328-2000	0.040
With Sorption	---	---	0.0015	67-2000	0.0015
Sulfate					
No Sorption	---	---	99.2	1407-2000	99.2
East Pit and Category 4 Stockpile					
Iron					
No Sorption	0.27	1-7	0.24	122-148	0.22
Sulfate					
No Sorption	14.0	66	46.1	129	27.7
Category 2/3 Stockpile					
Arsenic					
No Sorption	0.0034	66	0.013	153-2000	0.013
With Sorption	0.0021	1-66	0.0021	67-2000	0.0021
Iron					
No Sorption	0.20	1-66	0.41	167-2000	0.41
Manganese					
No Sorption	0.041	66	0.049	159-2000	0.049
Antimony					
No Sorption	0.0017	51-66	0.0078	159-166	0.0076
With Sorption	0.0015	1-66	0.0015	67-2000	0.0015
Sulfate					
No Sorption	18.0	66	203.7	156	185.0
Category 3 Lean Ore Stockpile					
Sulfate					
No Sorption	13.9	33-66	14.1	111-2000	14.1
Lean Ore Surge Pile					
Iron					
No Sorption	0.22	53-66	0.22	67-70	0.20
Manganese					
No Sorption	0.040	50-66	0.040	67-77	0.039
Sulfate					
No Sorption	14.1	60-66	14.0	67	13.6

Table 8-26. Summary of maximum concentration data predicted using the transient groundwater quality models with high liner leakage - Mine Site RA1

	Years 1-60		Years 61-2000		Final Concentration (mg/L)
	Maximum Concentration	Time of Max	Maximum Concentration	Time of Max	
	(mg/L)	(Year)	(mg/L)	(Year)	
Category 1 - Overburden Stockpile					
Arsenic					
No Sorption	0.0029	60	0.099	297-2000	0.099
With Sorption	0.0028	1-60	0.0028	61-2000	0.0028
Nickel					
No Sorption	0.012	58-60	0.11	217-2000	0.11
With Sorption	0.0057	1-60	0.0057	61-2000	0.0057
Antimony					
No Sorption	0.0015	1-28	0.016	166-2000	0.016
With Sorption	0.0015	1-60	0.0015	61-2000	0.0015
Sulfate					
No Sorption	41.6	60	408.2	565-2000	408.2
West Pit					
Arsenic					
No Sorption	---	---	0.079	427-2000	0.079
With Sorption	---	---	0.0028	61-2000	0.0028
Antimony					
No Sorption	---	---	0.038	420-2000	0.038
With Sorption	---	---	0.0015	61-2000	0.0015
Sulfate					
No Sorption	---	---	105.0	497-2000	105.0
East Pit and Category 4 Stockpile					
Iron					
No Sorption	0.27	1-6	0.27	120-140	0.24
Sulfate					
No Sorption	18.1	53-56	41.5	125	23.0
Category 2/3 Stockpile					
Arsenic					
No Sorption	0.011	60	0.022	138-2000	0.022
With Sorption	0.0021	1-60	0.0024	1935-2000	0.0024
Iron					
No Sorption	0.21	32-60	0.60	198-2000	0.60
Manganese					
No Sorption	0.048	60	0.077	165-2000	0.077
Antimony					
No Sorption	0.0025	60	0.0070	150-195	0.0069
With Sorption	0.0015	1-60	0.0015	61-2000	0.0015
Sulfate					
No Sorption	42.3	60	190.5	146-156	167.8
Category 3 Lean Ore Stockpile					
Sulfate					
No Sorption	26.7	60	27.2	90-178	27.1
Lean Ore Surge Pile					
Iron					
No Sorption	0.65	60	0.65	61-62	0.20
Manganese					
No Sorption	0.080	60	0.081	62-66	0.039
Sulfate					
No Sorption	29.3	60	29.5	61-63	13.6