Appendix F.1

Embarrass River

Proposed Action

Year 1

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

FLOWS

Case Flows	Year 1 Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	1.19	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	10.84	(cfs)	PM-13
	flow check	Q_ck_L =	10.84	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.26	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	3.19	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Year 1 Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	86.71	(cfs)	PM-13
	flow check	Q_ck_M =	86.71	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	3.19	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Year 1 High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	858.26	(cfs)	PM-13
	flow check	Q_ck_H =	858.26	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	3.19	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Silver**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00096	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.04	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.19	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.09	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)	0.04	(mg/s)	0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.10	(mg/s)	0.33	(mg/s)	2.74	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Aluminum**

Input concentration data				
	concentration of surface water into PM-12	C_s12 =	0.12	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.12	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.12	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.18	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		42.82	(mg/s)		486	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)		0.61	(mg/s)		0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.12	(mg/s)		1.12	(mg/s)		1.12	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		208.96	(mg/s)		2,386	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)		2.98	(mg/s)		2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.10	(mg/s)		0.75	(mg/s)		0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.90	(mg/s)		0.90	(mg/s)		0.90	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	89.13	(mg/s)		89.13	(mg/s)		89.13	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.73	(mg/s)		44.55	(mg/s)		487.90	(mg/s)
	mass flux in river at PM-13	M_r13 =	94.84	(mg/s)		347.27	(mg/s)		2,967.45	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.051	(mg/L)		0.114	(mg/L)		0.119	(mg/L)
	concentration in river at PM-13	C_r13 =	0.309	(mg/L)		0.142	(mg/L)		0.122	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Arsenic**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.005946518	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.27	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.31	(mg/s)	15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)	0.33	(mg/s)	0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.54	(mg/s)	0.54	(mg/s)	0.54	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.16	(mg/s)	0.16	(mg/s)	0.16	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.34	(mg/s)	3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.11	(mg/s)	2.75	(mg/s)	19.12	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.004	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Boron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.027	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.027	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.027	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.138981444	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	9.64	(mg/s)	109	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)	0.52	(mg/s)	0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.25	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	47.02	(mg/s)	537	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)	2.53	(mg/s)	2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.97	(mg/s)	7.41	(mg/s)	7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	12.53	(mg/s)	12.53	(mg/s)	12.53	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	18.63	(mg/s)	18.63	(mg/s)	18.63	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.77	(mg/s)	10.40	(mg/s)	110.16	(mg/s)
	mass flux in river at PM-13	M_r13 =	35.43	(mg/s)	98.51	(mg/s)	688.06	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.023	(mg/L)	0.027	(mg/L)	0.027	(mg/L)
	concentration in river at PM-13	C_r13 =	0.115	(mg/L)	0.040	(mg/L)	0.028	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Barium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.29E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	5.71	(mg/s)	65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)	1.66	(mg/s)	1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)	0.15	(mg/s)	0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	27.86	(mg/s)	318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)	8.11	(mg/s)	8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	4.77	(mg/s)	4.77	(mg/s)	4.77	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	5.25	(mg/s)	5.25	(mg/s)	5.25	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.81	(mg/s)	7.52	(mg/s)	66.63	(mg/s)
	mass flux in river at PM-13	M_r13 =	19.97	(mg/s)	53.76	(mg/s)	403.11	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.054	(mg/L)	0.019	(mg/L)	0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.065	(mg/L)	0.022	(mg/L)	0.017	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Beryllium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000271356	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.07	(mg/s)		0.29	(mg/s)		2.47	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Calcium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	15	(mg/L)
	concentration of surface water into PM-13	C_s13 =	15	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	15	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	45.78662467	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	5,352.95	(mg/s)	60,771	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)	462.42	(mg/s)	462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	140.09	(mg/s)	140.09	(mg/s)	140.09	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	26,119.49	(mg/s)	298,224	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)	2,263.72	(mg/s)	2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	701.59	(mg/s)	5,369.83	(mg/s)	5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	4,128.35	(mg/s)	4,128.35	(mg/s)	4,128.35	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	12.28	(mg/s)	12.28	(mg/s)	12.28	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,374.76	(mg/s)	3,374.76	(mg/s)	1.77	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	602.51	(mg/s)	5,955.45	(mg/s)	61,373.93	(mg/s)
	mass flux in river at PM-13	M_r13 =	11,083.21	(mg/s)	47,223.88	(mg/s)	371,373.85	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	17.891	(mg/L)	15.249	(mg/l)	15.024	(mg/l)
	concentration in river at PM-13	C_r13 =	36.122	(mg/L)	19.244	(mg/l)	15.290	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Cadmium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000117453	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.03	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.14	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)		0.04	(mg/s)		0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.07	(mg/s)		0.24	(mg/s)		1.99	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Chloride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.5	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.5	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.5	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.89E+01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,319.61	(mg/s)		26,334	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)		43.81	(mg/s)		43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	60.70	(mg/s)		60.70	(mg/s)		60.70	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		11,318.44	(mg/s)		129,230	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)		214.46	(mg/s)		214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	43.78	(mg/s)		335.09	(mg/s)		335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,700.65	(mg/s)		1,700.65	(mg/s)		1,700.65	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	51.97	(mg/s)		51.97	(mg/s)		51.97	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,216.00	(mg/s)		1,216.00	(mg/s)		1,216.00	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	104.51	(mg/s)		2,424.12	(mg/s)		26,438.79	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,331.37	(mg/s)		17,260.73	(mg/s)		159,187.35	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	3.103	(mg/L)		6.207	(mg/L)		6.472	(mg/L)
	concentration in river at PM-13	C_r13 =	10.858	(mg/L)		7.034	(mg/L)		6.554	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 1
Parameter	Cobalt

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001174401	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.21	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.04	(mg/s)		12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.11	(mg/s)		0.11	(mg/s)		0.11	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.25	(mg/s)		2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.36	(mg/s)		1.65	(mg/s)		14.75	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Copper**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.005888719	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.54	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.61	(mg/s)	30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)	0.48	(mg/s)	0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)	0.19	(mg/s)	0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.53	(mg/s)	0.53	(mg/s)	0.53	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.26	(mg/s)	0.26	(mg/s)	0.26	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.11	(mg/s)	0.65	(mg/s)	6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.40	(mg/s)	4.72	(mg/s)	37.47	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.002	(mg/L)	0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.005	(mg/L)	0.002	(mg/L)	0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.2	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.2	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.2	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	4.57E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	71.37	(mg/s)	810	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)	9.37	(mg/s)	9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.87	(mg/s)	1.87	(mg/s)	1.87	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	348.26	(mg/s)	3,976	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)	45.87	(mg/s)	45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.92	(mg/s)	7.04	(mg/s)	7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	412.18	(mg/s)	412.18	(mg/s)	412.18	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.08	(mg/s)	0.08	(mg/s)	0.08	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	87.50	(mg/s)	87.50	(mg/s)	87.50	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	11.24	(mg/s)	82.61	(mg/s)	821.52	(mg/s)
	mass flux in river at PM-13	M_r13 =	557.79	(mg/s)	983.54	(mg/s)	5,350.52	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.334	(mg/L)	0.212	(mg/L)	0.201	(mg/L)
	concentration in river at PM-13	C_r13 =	1.818	(mg/L)	0.401	(mg/L)	0.220	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Iron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	4.00E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,034.90	(mg/s)		11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)		0.85	(mg/s)		0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	27.08	(mg/s)		27.08	(mg/s)		27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		5,049.77	(mg/s)		57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)		4.17	(mg/s)		4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.28	(mg/s)		2.13	(mg/s)		2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.36	(mg/s)		0.36	(mg/s)		0.36	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	259.35	(mg/s)		259.35	(mg/s)		259.35	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	27.93	(mg/s)		1,062.84	(mg/s)		11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	292.10	(mg/s)		6,378.62	(mg/s)		69,699.73	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.829	(mg/L)		2.721	(mg/L)		2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.952	(mg/L)		2.599	(mg/L)		2.870	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Hardness**

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	3.15E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		24,980.41	(mg/s)		283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)		2,129.58	(mg/s)		2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	653.73	(mg/s)		653.73	(mg/s)		653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		121,890.93	(mg/s)		1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)		10,425.01	(mg/s)		10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	6,936.49	(mg/s)		53,090.84	(mg/s)		53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	28,397.48	(mg/s)		28,397.48	(mg/s)		28,397.48	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	254.25	(mg/s)		254.25	(mg/s)		254.25	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	24,647.41	(mg/s)		24,647.41	(mg/s)		24,647.41	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,783.31	(mg/s)		27,763.72	(mg/s)		286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	73,443.94	(mg/s)		266,469.63	(mg/s)		1,794,910.18	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	82.647	(mg/L)		71.091	(mg/L)		70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	239.367	(mg/L)		108.588	(mg/L)		73.899	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Potassium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.60	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.60	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.60	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	9.15	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	214.12	(mg/s)	2,431	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)	38.94	(mg/s)	38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)	0.05	(mg/s)	0.05	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1,044.78	(mg/s)	11,929	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)	190.63	(mg/s)	190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	5.60	(mg/s)	5.60	(mg/s)	5.60	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	395.86	(mg/s)	3,029.85	(mg/s)	3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	825.45	(mg/s)	825.45	(mg/s)	825.45	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	438.64	(mg/s)	438.64	(mg/s)	438.64	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	38.99	(mg/s)	253.11	(mg/s)	2,469.85	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,895.18	(mg/s)	5,788.07	(mg/s)	18,888.99	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.158	(mg/L)	0.648	(mg/L)	0.605	(mg/l)
	concentration in river at PM-13	C_r13 =	6.177	(mg/L)	2.359	(mg/L)	0.778	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Magnesium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	5.90	(mg/L)
	concentration of surface water into PM-13	C_s13 =	5.90	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	5.90	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	48.72	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,105.49	(mg/s)		23,903	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	55.10	(mg/s)		55.10	(mg/s)		55.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,273.66	(mg/s)		117,301	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)		1,268.87	(mg/s)		1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	1,994.02	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	4,392.66	(mg/s)		4,392.66	(mg/s)		4,392.66	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	6.29	(mg/s)		6.29	(mg/s)		6.29	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,950.02	(mg/s)		3,950.02	(mg/s)		3,950.02	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	314.30	(mg/s)		2,419.79	(mg/s)		24,217.73	(mg/s)
	mass flux in river at PM-13	M_r13 =	11,926.17	(mg/s)		37,573.21	(mg/s)		166,398.91	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	9.333	(mg/L)		6.196	(mg/l)		5.928	(mg/l)
	concentration in river at PM-13	C_r13 =	38.870	(mg/L)		15.311	(mg/l)		6.851	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Manganese**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.29	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	2.80	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)		22.40	(mg/s)		22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	3.57	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	26.10	(mg/s)		26.10	(mg/s)		26.10	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	66.78	(mg/s)		66.78	(mg/s)		66.78	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	7.38	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	126.23	(mg/s)		779.42	(mg/s)		7,329.88	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.219	(mg/L)		0.293	(mg/l)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.411	(mg/L)		0.318	(mg/l)		0.302	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Sodium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	66.13	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	56.03	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)		583.80	(mg/s)		583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	879.28	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	5,962.27	(mg/s)		5,962.27	(mg/s)		5,962.27	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	7.53	(mg/s)		7.53	(mg/s)		7.53	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,501.44	(mg/s)		2,501.44	(mg/s)		2,501.44	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	175.29	(mg/s)		2,316.47	(mg/s)		24,483.86	(mg/s)
	mass flux in river at PM-13	M_r13 =	10,109.61	(mg/s)		28,549.18	(mg/s)		159,558.37	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	5.205	(mg/L)		5.931	(mg/l)		5.993	(mg/l)
	concentration in river at PM-13	C_r13 =	32.949	(mg/L)		11.634	(mg/l)		6.569	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.009513833	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.43	(mg/s)	5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)	0.17	(mg/s)	0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.09	(mg/s)	24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)	0.83	(mg/s)	0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.04	(mg/s)	0.29	(mg/s)	0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.86	(mg/s)	0.86	(mg/s)	0.86	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.39	(mg/s)	0.39	(mg/s)	0.39	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.18	(mg/s)	0.61	(mg/s)	5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.30	(mg/s)	5.08	(mg/s)	31.28	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.005	(mg/L)	0.002	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.008	(mg/L)	0.002	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Lead**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000585798	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.05	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.26	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)	0.14	(mg/s)	0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.02	(mg/s)	0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.05	(mg/s)	0.05	(mg/s)	0.05	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.08	(mg/s)	0.64	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.30	(mg/s)	0.63	(mg/s)	3.90	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Antimony**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	4.83E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.01	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.07	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)	0.18	(mg/s)	0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.44	(mg/s)	0.44	(mg/s)	0.44	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)	0.05	(mg/s)	0.20	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.67	(mg/s)	0.76	(mg/s)	1.64	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Selenium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000967892	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.11	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.52	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)		0.35	(mg/s)		0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.18	(mg/s)		1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.59	(mg/s)		1.30	(mg/s)		7.85	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)		0.001	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	142.79	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,427.45	(mg/s)		16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)		206.87	(mg/s)		206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	37.36	(mg/s)		37.36	(mg/s)		37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,965.20	(mg/s)		79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)		1,012.72	(mg/s)		1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	7,698.43	(mg/s)		58,922.60	(mg/s)		58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	12,874.84	(mg/s)		12,874.84	(mg/s)		12,874.84	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	216.95	(mg/s)		216.95	(mg/s)		216.95	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	8,603.45	(mg/s)		8,603.45	(mg/s)		8,603.45	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	244.23	(mg/s)		1,671.68	(mg/s)		16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	30,650.62	(mg/s)		90,267.44	(mg/s)		177,606.90	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	7.252	(mg/L)		4.280	(mg/l)		4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	99.896	(mg/L)		36.785	(mg/l)		7.312	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 1
Parameter	Thallium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00096816	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.11	(mg/s)		0.55	(mg/s)		4.92	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 1**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.009842772	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.02	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.89	(mg/s)		0.89	(mg/s)		0.89	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.81	(mg/s)		0.81	(mg/s)		0.81	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.43	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	3.52	(mg/s)		37.24	(mg/s)		386.59	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.013	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.011	(mg/L)		0.015	(mg/L)		0.016	(mg/L)

Appendix F.2

Embarrass River

Proposed Action

Year 5

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

FLOWS

Case Flows	Year 5 Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	1.19	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	11.77	(cfs)	PM-13
	flow check	Q_ck_L =	11.77	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.26	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	4.10	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.01	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Year 5 Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	87.64	(cfs)	PM-13
	flow check	Q_ck_M =	87.64	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	4.10	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.01	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Year 5 High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	859.19	(cfs)	PM-13
	flow check	Q_ck_H =	859.19	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	4.10	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.01	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Silver**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00090	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.10	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.11	(mg/s)		0.35	(mg/s)		2.75	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Aluminum**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.12	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.12	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.12	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	9.61E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		42.82	(mg/s)		486	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)		0.61	(mg/s)		0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.12	(mg/s)		1.12	(mg/s)		1.12	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		208.96	(mg/s)		2,386	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)		2.98	(mg/s)		2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.10	(mg/s)		0.75	(mg/s)		0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	11.16	(mg/s)		11.16	(mg/s)		11.16	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.08	(mg/s)		0.08	(mg/s)		0.08	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	89.13	(mg/s)		89.13	(mg/s)		89.13	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.73	(mg/s)		44.55	(mg/s)		487.90	(mg/s)
	mass flux in river at PM-13	M_r13 =	105.17	(mg/s)		357.60	(mg/s)		2,977.78	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.051	(mg/L)		0.114	(mg/L)		0.119	(mg/L)
	concentration in river at PM-13	C_r13 =	0.316	(mg/L)		0.144	(mg/L)		0.122	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Arsenic**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.006775027	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.27	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.31	(mg/s)	15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)	0.33	(mg/s)	0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.79	(mg/s)	0.79	(mg/s)	0.79	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.16	(mg/s)	0.16	(mg/s)	0.16	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.34	(mg/s)	3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.36	(mg/s)	3.00	(mg/s)	19.38	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.004	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Boron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.027	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.027	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.027	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.135355742	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	9.64	(mg/s)	109	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)	0.52	(mg/s)	0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.25	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	47.02	(mg/s)	537	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)	2.53	(mg/s)	2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.97	(mg/s)	7.41	(mg/s)	7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	15.72	(mg/s)	15.72	(mg/s)	15.72	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)	0.05	(mg/s)	0.05	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	18.63	(mg/s)	18.63	(mg/s)	18.63	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.77	(mg/s)	10.40	(mg/s)	110.16	(mg/s)
	mass flux in river at PM-13	M_r13 =	38.65	(mg/s)	101.74	(mg/s)	691.28	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.023	(mg/L)	0.027	(mg/L)	0.027	(mg/L)
	concentration in river at PM-13	C_r13 =	0.116	(mg/L)	0.041	(mg/L)	0.028	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Barium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.03E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	5.71	(mg/s)	65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)	1.66	(mg/s)	1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)	0.15	(mg/s)	0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	27.86	(mg/s)	318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)	8.11	(mg/s)	8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	5.84	(mg/s)	5.84	(mg/s)	5.84	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	5.25	(mg/s)	5.25	(mg/s)	5.25	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.81	(mg/s)	7.52	(mg/s)	66.63	(mg/s)
	mass flux in river at PM-13	M_r13 =	21.05	(mg/s)	54.83	(mg/s)	404.19	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.054	(mg/L)	0.019	(mg/L)	0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.063	(mg/L)	0.022	(mg/L)	0.017	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Beryllium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000454842	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.04	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.17	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.05	(mg/s)	0.05	(mg/s)	0.05	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)	0.04	(mg/s)	0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.10	(mg/s)	0.31	(mg/s)	2.50	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Calcium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	15	(mg/L)
	concentration of surface water into PM-13	C_s13 =	15	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	15	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	55.55427025	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	5,352.95	(mg/s)	60,771	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)	462.42	(mg/s)	462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	140.09	(mg/s)	140.09	(mg/s)	140.09	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	26,119.49	(mg/s)	298,224	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)	2,263.72	(mg/s)	2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	701.59	(mg/s)	5,369.83	(mg/s)	5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	6,450.21	(mg/s)	6,450.21	(mg/s)	6,450.21	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	176.59	(mg/s)	176.59	(mg/s)	176.59	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,374.76	(mg/s)	3,374.76	(mg/s)	25.38	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	602.51	(mg/s)	5,955.45	(mg/s)	61,373.93	(mg/s)
	mass flux in river at PM-13	M_r13 =	13,569.37	(mg/s)	49,710.04	(mg/s)	373,883.63	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	17.891	(mg/L)	15.249	(mg/l)	15.024	(mg/l)
	concentration in river at PM-13	C_r13 =	40.729	(mg/L)	20.042	(mg/l)	15.377	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Cadmium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000238486	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.03	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.14	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)		0.04	(mg/s)		0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.08	(mg/s)		0.26	(mg/s)		2.00	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Chloride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.5	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.5	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.5	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.07E+01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,319.61	(mg/s)		26,334	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)		43.81	(mg/s)		43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	60.70	(mg/s)		60.70	(mg/s)		60.70	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		11,318.44	(mg/s)		129,230	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)		214.46	(mg/s)		214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	43.78	(mg/s)		335.09	(mg/s)		335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,244.90	(mg/s)		1,244.90	(mg/s)		1,244.90	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	747.10	(mg/s)		747.10	(mg/s)		747.10	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,216.00	(mg/s)		1,216.00	(mg/s)		1,216.00	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	104.51	(mg/s)		2,424.12	(mg/s)		26,438.79	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,570.75	(mg/s)		17,500.11	(mg/s)		159,426.73	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	3.103	(mg/L)		6.207	(mg/L)		6.472	(mg/L)
	concentration in river at PM-13	C_r13 =	10.718	(mg/L)		7.056	(mg/L)		6.557	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Cobalt**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00200513	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.21	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.04	(mg/s)	12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)	0.13	(mg/s)	0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.23	(mg/s)	0.23	(mg/s)	0.23	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.09	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.25	(mg/s)	2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.49	(mg/s)	1.78	(mg/s)	14.88	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Copper**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.007797191	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.54	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.61	(mg/s)		30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)		0.48	(mg/s)		0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)		0.19	(mg/s)		0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.91	(mg/s)		0.91	(mg/s)		0.91	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.26	(mg/s)		0.26	(mg/s)		0.26	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.11	(mg/s)		0.65	(mg/s)		6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.78	(mg/s)		5.09	(mg/s)		37.84	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)		0.002	(mg/L)		0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.005	(mg/L)		0.002	(mg/L)		0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 5
Parameter	Fluoride

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.2	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.2	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.2	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	2.25E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	71.37	(mg/s)	810	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)	9.37	(mg/s)	9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.87	(mg/s)	1.87	(mg/s)	1.87	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	348.26	(mg/s)	3,976	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)	45.87	(mg/s)	45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.92	(mg/s)	7.04	(mg/s)	7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	260.89	(mg/s)	260.89	(mg/s)	260.89	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	1.21	(mg/s)	1.21	(mg/s)	1.21	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	87.50	(mg/s)	87.50	(mg/s)	87.50	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	11.24	(mg/s)	82.61	(mg/s)	821.52	(mg/s)
	mass flux in river at PM-13	M_r13 =	407.63	(mg/s)	833.39	(mg/s)	5,200.36	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.334	(mg/L)	0.212	(mg/L)	0.201	(mg/L)
	concentration in river at PM-13	C_r13 =	1.224	(mg/L)	0.336	(mg/L)	0.214	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Iron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.96E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,034.90	(mg/s)		11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)		0.85	(mg/s)		0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	27.08	(mg/s)		27.08	(mg/s)		27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		5,049.77	(mg/s)		57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)		4.17	(mg/s)		4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.28	(mg/s)		2.13	(mg/s)		2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	6.92	(mg/s)		6.92	(mg/s)		6.92	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	259.35	(mg/s)		259.35	(mg/s)		259.35	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	27.93	(mg/s)		1,062.84	(mg/s)		11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	298.82	(mg/s)		6,385.34	(mg/s)		69,706.44	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.829	(mg/L)		2.721	(mg/L)		2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.897	(mg/L)		2.574	(mg/L)		2.867	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 5
Parameter	Hardness

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	2.61E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	24,980.41	(mg/s)	283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)	2,129.58	(mg/s)	2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	653.73	(mg/s)	653.73	(mg/s)	653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	121,890.93	(mg/s)	1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)	10,425.01	(mg/s)	10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	6,936.49	(mg/s)	53,090.84	(mg/s)	53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	30,336.71	(mg/s)	30,336.71	(mg/s)	30,336.71	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	3,654.83	(mg/s)	3,654.83	(mg/s)	3,654.83	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	24,647.41	(mg/s)	24,647.41	(mg/s)	24,647.41	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,783.31	(mg/s)	27,763.72	(mg/s)	286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	78,783.76	(mg/s)	271,809.45	(mg/s)	1,800,250.00	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	82.647	(mg/L)	71.091	(mg/L)	70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	236.473	(mg/L)	109.588	(mg/L)	74.038	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Potassium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.60	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.60	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.60	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	7.67	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		214.12	(mg/s)		2,431	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.76	(mg/s)		0.76	(mg/s)		0.76	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1,044.78	(mg/s)		11,929	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	5.60	(mg/s)		5.60	(mg/s)		5.60	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	395.86	(mg/s)		3,029.85	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	890.78	(mg/s)		890.78	(mg/s)		890.78	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	438.64	(mg/s)		438.64	(mg/s)		438.64	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.70	(mg/s)		253.82	(mg/s)		2,470.56	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,961.22	(mg/s)		5,854.11	(mg/s)		18,955.03	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.179	(mg/L)		0.650	(mg/L)		0.605	(mg/l)
	concentration in river at PM-13	C_r13 =	5.887	(mg/L)		2.360	(mg/L)		0.780	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Magnesium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	5.90	(mg/L)
	concentration of surface water into PM-13	C_s13 =	5.90	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	5.90	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	29.76	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	2,105.49	(mg/s)	23,903	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)	259.20	(mg/s)	259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	55.10	(mg/s)	55.10	(mg/s)	55.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	10,273.66	(mg/s)	117,301	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)	1,268.87	(mg/s)	1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	1,994.02	(mg/s)	15,261.91	(mg/s)	15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3,455.69	(mg/s)	3,455.69	(mg/s)	3,455.69	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	90.42	(mg/s)	90.42	(mg/s)	90.42	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,950.02	(mg/s)	3,950.02	(mg/s)	3,950.02	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	314.30	(mg/s)	2,419.79	(mg/s)	24,217.73	(mg/s)
	mass flux in river at PM-13	M_r13 =	11,073.32	(mg/s)	36,720.36	(mg/s)	165,546.07	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	9.333	(mg/L)	6.196	(mg/l)	5.928	(mg/l)
	concentration in river at PM-13	C_r13 =	33.237	(mg/L)	14.805	(mg/l)	6.808	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Manganese**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.31	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	107.06	(mg/s)	1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)	4.58	(mg/s)	4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	2.80	(mg/s)	2.80	(mg/s)	2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	522.39	(mg/s)	5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)	22.40	(mg/s)	22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	3.57	(mg/s)	27.31	(mg/s)	27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	36.00	(mg/s)	36.00	(mg/s)	36.00	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	66.78	(mg/s)	66.78	(mg/s)	66.78	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	7.38	(mg/s)	114.44	(mg/s)	1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	136.13	(mg/s)	789.32	(mg/s)	7,339.78	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.219	(mg/L)	0.293	(mg/l)	0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.409	(mg/L)	0.318	(mg/l)	0.302	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Sodium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	34.82	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	56.03	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)		583.80	(mg/s)		583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	879.28	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	4,042.46	(mg/s)		4,042.46	(mg/s)		4,042.46	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	108.24	(mg/s)		108.24	(mg/s)		108.24	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,501.44	(mg/s)		2,501.44	(mg/s)		2,501.44	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	175.29	(mg/s)		2,316.47	(mg/s)		24,483.86	(mg/s)
	mass flux in river at PM-13	M_r13 =	8,290.51	(mg/s)		26,730.09	(mg/s)		157,739.28	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	5.205	(mg/L)		5.931	(mg/l)		5.993	(mg/l)
	concentration in river at PM-13	C_r13 =	24.884	(mg/L)		10.777	(mg/l)		6.487	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.029814715	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.43	(mg/s)	5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)	0.17	(mg/s)	0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.09	(mg/s)	24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)	0.83	(mg/s)	0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.04	(mg/s)	0.29	(mg/s)	0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3.46	(mg/s)	3.46	(mg/s)	3.46	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.39	(mg/s)	0.39	(mg/s)	0.39	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.18	(mg/s)	0.61	(mg/s)	5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	4.95	(mg/s)	7.72	(mg/s)	33.92	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.005	(mg/L)	0.002	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.015	(mg/L)	0.003	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Lead**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000769203	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.05	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.26	(mg/s)		3	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)		0.14	(mg/s)		0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.08	(mg/s)		0.64	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.33	(mg/s)		0.66	(mg/s)		3.94	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Antimony**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.47E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.01	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)		0.18	(mg/s)		0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.75	(mg/s)		0.75	(mg/s)		0.75	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)		0.05	(mg/s)		0.20	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.98	(mg/s)		1.08	(mg/s)		1.95	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Selenium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001159434	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.11	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.52	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)		0.35	(mg/s)		0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.02	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.18	(mg/s)		1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.66	(mg/s)		1.36	(mg/s)		7.92	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)		0.001	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	140.42	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	1,427.45	(mg/s)	16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)	206.87	(mg/s)	206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	37.36	(mg/s)	37.36	(mg/s)	37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	6,965.20	(mg/s)	79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)	1,012.72	(mg/s)	1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	7,698.43	(mg/s)	58,922.60	(mg/s)	58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	16,304.02	(mg/s)	16,304.02	(mg/s)	16,304.02	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	3,118.71	(mg/s)	3,118.71	(mg/s)	3,118.71	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	8,603.45	(mg/s)	8,603.45	(mg/s)	8,603.45	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	244.23	(mg/s)	1,671.68	(mg/s)	16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	36,981.55	(mg/s)	96,598.37	(mg/s)	183,937.83	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	7.252	(mg/L)	4.280	(mg/l)	4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	111.002	(mg/L)	38.947	(mg/l)	7.565	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000906999	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.07	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.35	(mg/s)	4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.11	(mg/s)	0.11	(mg/s)	0.11	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)	0.07	(mg/s)	0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.12	(mg/s)	0.57	(mg/s)	4.94	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 5**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.017646569	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.02	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2.05	(mg/s)		2.05	(mg/s)		2.05	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.81	(mg/s)		0.81	(mg/s)		0.81	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.43	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	4.68	(mg/s)		38.40	(mg/s)		387.76	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.013	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.014	(mg/L)		0.015	(mg/L)		0.016	(mg/L)

Appendix F.3

Embarrass River

Proposed Action

Year 8

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

FLOWS

Case Flows	Year 8 Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	1.19	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	12.46	(cfs)	PM-13
	flow check	Q_ck_L =	12.46	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.26	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	4.79	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.01	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Year 8 Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	88.33	(cfs)	PM-13
	flow check	Q_ck_M =	88.33	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	4.79	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.01	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Year 8 High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	859.88	(cfs)	PM-13
	flow check	Q_ck_H =	859.88	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	4.79	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.01	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Silver**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00089	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.12	(mg/s)		0.12	(mg/s)		0.12	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.13	(mg/s)		0.37	(mg/s)		2.77	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 8
Parameter	Aluminum

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.12	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.12	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.12	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.01E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		42.82	(mg/s)		486	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)		0.61	(mg/s)		0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.12	(mg/s)		1.12	(mg/s)		1.12	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		208.96	(mg/s)		2,386	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)		2.98	(mg/s)		2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.10	(mg/s)		0.75	(mg/s)		0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	13.63	(mg/s)		13.63	(mg/s)		13.63	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	89.13	(mg/s)		89.13	(mg/s)		89.13	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.73	(mg/s)		44.55	(mg/s)		487.90	(mg/s)
	mass flux in river at PM-13	M_r13 =	107.62	(mg/s)		360.05	(mg/s)		2,980.23	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.051	(mg/L)		0.114	(mg/L)		0.119	(mg/L)
	concentration in river at PM-13	C_r13 =	0.305	(mg/L)		0.144	(mg/L)		0.122	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Arsenic**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.007035766	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.27	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.31	(mg/s)	15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)	0.33	(mg/s)	0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.95	(mg/s)	0.95	(mg/s)	0.95	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.16	(mg/s)	0.16	(mg/s)	0.16	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.34	(mg/s)	3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.53	(mg/s)	3.17	(mg/s)	19.54	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.004	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 8
Parameter	Boron

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.027	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.027	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.027	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.140897597	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		9.64	(mg/s)		109	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)		0.52	(mg/s)		0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.25	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		47.02	(mg/s)		537	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)		2.53	(mg/s)		2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.97	(mg/s)		7.41	(mg/s)		7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	19.10	(mg/s)		19.10	(mg/s)		19.10	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	18.63	(mg/s)		18.63	(mg/s)		18.63	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.77	(mg/s)		10.40	(mg/s)		110.16	(mg/s)
	mass flux in river at PM-13	M_r13 =	42.03	(mg/s)		105.11	(mg/s)		694.66	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.023	(mg/L)		0.027	(mg/L)		0.027	(mg/L)
	concentration in river at PM-13	C_r13 =	0.119	(mg/L)		0.042	(mg/L)		0.029	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Barium**

Input concentration data				
	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.04E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)		1.66	(mg/s)		1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)		8.11	(mg/s)		8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	6.84	(mg/s)		6.84	(mg/s)		6.84	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	5.25	(mg/s)		5.25	(mg/s)		5.25	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.81	(mg/s)		7.52	(mg/s)		66.63	(mg/s)
	mass flux in river at PM-13	M_r13 =	22.04	(mg/s)		55.82	(mg/s)		405.18	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.054	(mg/L)		0.019	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.063	(mg/L)		0.022	(mg/L)		0.017	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 8
Parameter	Beryllium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000543459	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.04	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.17	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)	0.04	(mg/s)	0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.12	(mg/s)	0.34	(mg/s)	2.52	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 8
Parameter	Calcium

Input concentration data	concentration of surface water into PM-12	C_s12 =	15	(mg/L)
	concentration of surface water into PM-13	C_s13 =	15	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	15	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	72.53696661	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5,352.95	(mg/s)		60,771	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)		462.42	(mg/s)		462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	140.09	(mg/s)		140.09	(mg/s)		140.09	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		26,119.49	(mg/s)		298,224	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)		2,263.72	(mg/s)		2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	701.59	(mg/s)		5,369.83	(mg/s)		5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	9,833.30	(mg/s)		9,833.30	(mg/s)		9,833.30	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	132.27	(mg/s)		132.27	(mg/s)		132.27	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,374.76	(mg/s)		3,374.76	(mg/s)		19.01	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	602.51	(mg/s)		5,955.45	(mg/s)		61,373.93	(mg/s)
	mass flux in river at PM-13	M_r13 =	16,908.15	(mg/s)		53,048.82	(mg/s)		377,216.04	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	17.891	(mg/L)		15.249	(mg/l)		15.024	(mg/l)
	concentration in river at PM-13	C_r13 =	47.965	(mg/L)		21.223	(mg/l)		15.501	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Cadmium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000383404	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.03	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.14	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)		0.04	(mg/s)		0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.11	(mg/s)		0.28	(mg/s)		2.03	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Chloride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.5	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.5	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.5	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.07E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	2,319.61	(mg/s)	26,334	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)	43.81	(mg/s)	43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	60.70	(mg/s)	60.70	(mg/s)	60.70	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	11,318.44	(mg/s)	129,230	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)	214.46	(mg/s)	214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	43.78	(mg/s)	335.09	(mg/s)	335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	823.25	(mg/s)	823.25	(mg/s)	823.25	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	559.62	(mg/s)	559.62	(mg/s)	559.62	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,216.00	(mg/s)	1,216.00	(mg/s)	1,216.00	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	104.51	(mg/s)	2,424.12	(mg/s)	26,438.79	(mg/s)
	mass flux in river at PM-13	M_r13 =	2,961.63	(mg/s)	16,890.98	(mg/s)	158,817.61	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	3.103	(mg/L)	6.207	(mg/L)	6.472	(mg/L)
	concentration in river at PM-13	C_r13 =	8.401	(mg/L)	6.757	(mg/L)	6.526	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Cobalt**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.002321539	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.21	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.04	(mg/s)		12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.31	(mg/s)		0.31	(mg/s)		0.31	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.25	(mg/s)		2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.57	(mg/s)		1.86	(mg/s)		14.96	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 8
Parameter	Copper

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00854201	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.54	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.61	(mg/s)		30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)		0.48	(mg/s)		0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)		0.19	(mg/s)		0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.16	(mg/s)		1.16	(mg/s)		1.16	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.26	(mg/s)		0.26	(mg/s)		0.26	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.11	(mg/s)		0.65	(mg/s)		6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.03	(mg/s)		5.35	(mg/s)		38.10	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)		0.002	(mg/L)		0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.006	(mg/L)		0.002	(mg/L)		0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.2	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.2	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.2	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	7.89E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		71.37	(mg/s)		810	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.87	(mg/s)		1.87	(mg/s)		1.87	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		348.26	(mg/s)		3,976	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)		45.87	(mg/s)		45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.92	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	106.94	(mg/s)		106.94	(mg/s)		106.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.91	(mg/s)		0.91	(mg/s)		0.91	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	87.50	(mg/s)		87.50	(mg/s)		87.50	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	11.24	(mg/s)		82.61	(mg/s)		821.52	(mg/s)
	mass flux in river at PM-13	M_r13 =	253.37	(mg/s)		679.12	(mg/s)		5,046.10	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.334	(mg/L)		0.212	(mg/L)		0.201	(mg/L)
	concentration in river at PM-13	C_r13 =	0.719	(mg/L)		0.272	(mg/L)		0.207	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Iron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.80E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,034.90	(mg/s)		11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)		0.85	(mg/s)		0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	27.08	(mg/s)		27.08	(mg/s)		27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		5,049.77	(mg/s)		57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)		4.17	(mg/s)		4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.28	(mg/s)		2.13	(mg/s)		2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	7.86	(mg/s)		7.86	(mg/s)		7.86	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	259.35	(mg/s)		259.35	(mg/s)		259.35	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	27.93	(mg/s)		1,062.84	(mg/s)		11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	299.72	(mg/s)		6,386.23	(mg/s)		69,707.34	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.829	(mg/L)		2.721	(mg/L)		2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.850	(mg/L)		2.555	(mg/L)		2.865	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Hardness**

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	2.52E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		24,980.41	(mg/s)		283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)		2,129.58	(mg/s)		2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	653.73	(mg/s)		653.73	(mg/s)		653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		121,890.93	(mg/s)		1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)		10,425.01	(mg/s)		10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	6,936.49	(mg/s)		53,090.84	(mg/s)		53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	34,228.62	(mg/s)		34,228.62	(mg/s)		34,228.62	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	2,737.70	(mg/s)		2,737.70	(mg/s)		2,737.70	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	24,647.41	(mg/s)		24,647.41	(mg/s)		24,647.41	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,783.31	(mg/s)		27,763.72	(mg/s)		286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	81,758.54	(mg/s)		274,784.23	(mg/s)		1,803,224.78	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	82.647	(mg/L)		71.091	(mg/L)		70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	231.931	(mg/L)		109.930	(mg/L)		74.102	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Potassium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.60	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.60	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.60	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.73	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	214.12	(mg/s)	2,431	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)	38.94	(mg/s)	38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.57	(mg/s)	0.57	(mg/s)	0.57	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1,044.78	(mg/s)	11,929	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)	190.63	(mg/s)	190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	5.60	(mg/s)	5.60	(mg/s)	5.60	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	395.86	(mg/s)	3,029.85	(mg/s)	3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	912.75	(mg/s)	912.75	(mg/s)	912.75	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	438.64	(mg/s)	438.64	(mg/s)	438.64	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.51	(mg/s)	253.63	(mg/s)	2,470.37	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,982.99	(mg/s)	5,875.88	(mg/s)	18,976.80	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.173	(mg/L)	0.649	(mg/L)	0.605	(mg/l)
	concentration in river at PM-13	C_r13 =	5.625	(mg/L)	2.351	(mg/L)	0.780	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Magnesium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	5.90	(mg/L)
	concentration of surface water into PM-13	C_s13 =	5.90	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	5.90	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	17.33	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,105.49	(mg/s)		23,903	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	55.10	(mg/s)		55.10	(mg/s)		55.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,273.66	(mg/s)		117,301	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)		1,268.87	(mg/s)		1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	1,994.02	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2,349.41	(mg/s)		2,349.41	(mg/s)		2,349.41	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	67.73	(mg/s)		67.73	(mg/s)		67.73	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,950.02	(mg/s)		3,950.02	(mg/s)		3,950.02	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	314.30	(mg/s)		2,419.79	(mg/s)		24,217.73	(mg/s)
	mass flux in river at PM-13	M_r13 =	9,944.35	(mg/s)		35,591.39	(mg/s)		164,417.09	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	9.333	(mg/L)		6.196	(mg/l)		5.928	(mg/l)
	concentration in river at PM-13	C_r13 =	28.210	(mg/L)		14.239	(mg/l)		6.757	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Manganese**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.30	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	2.80	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)		22.40	(mg/s)		22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	3.57	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	40.29	(mg/s)		40.29	(mg/s)		40.29	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	66.78	(mg/s)		66.78	(mg/s)		66.78	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	7.38	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	140.42	(mg/s)		793.61	(mg/s)		7,344.07	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.219	(mg/L)		0.293	(mg/l)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.398	(mg/L)		0.317	(mg/l)		0.302	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Sodium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	18.93	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	56.03	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)		583.80	(mg/s)		583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	879.28	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2,566.23	(mg/s)		2,566.23	(mg/s)		2,566.23	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	81.08	(mg/s)		81.08	(mg/s)		81.08	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,501.44	(mg/s)		2,501.44	(mg/s)		2,501.44	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	175.29	(mg/s)		2,316.47	(mg/s)		24,483.86	(mg/s)
	mass flux in river at PM-13	M_r13 =	6,787.12	(mg/s)		25,226.70	(mg/s)		156,235.89	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	5.205	(mg/L)		5.931	(mg/l)		5.993	(mg/l)
	concentration in river at PM-13	C_r13 =	19.254	(mg/L)		10.092	(mg/l)		6.420	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.038551821	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.43	(mg/s)		5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.09	(mg/s)		24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)		0.83	(mg/s)		0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.04	(mg/s)		0.29	(mg/s)		0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	5.23	(mg/s)		5.23	(mg/s)		5.23	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.39	(mg/s)		0.39	(mg/s)		0.39	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.18	(mg/s)		0.61	(mg/s)		5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	6.70	(mg/s)		9.47	(mg/s)		35.67	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.005	(mg/L)		0.002	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.019	(mg/L)		0.004	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Lead**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001239552	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.05	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.26	(mg/s)		3	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)		0.14	(mg/s)		0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.08	(mg/s)		0.64	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.41	(mg/s)		0.74	(mg/s)		4.02	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Antimony**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	8.28E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.01	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.07	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)	0.18	(mg/s)	0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.12	(mg/s)	1.12	(mg/s)	1.12	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)	0.05	(mg/s)	0.20	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.35	(mg/s)	1.45	(mg/s)	2.32	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.004	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Selenium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001331851	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.11	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.52	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)		0.35	(mg/s)		0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.18	(mg/s)		0.18	(mg/s)		0.18	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.02	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.18	(mg/s)		1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.70	(mg/s)		1.40	(mg/s)		7.96	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)		0.001	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	153.28	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,427.45	(mg/s)		16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)		206.87	(mg/s)		206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	37.36	(mg/s)		37.36	(mg/s)		37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,965.20	(mg/s)		79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)		1,012.72	(mg/s)		1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	7,698.43	(mg/s)		58,922.60	(mg/s)		58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	20,779.12	(mg/s)		20,779.12	(mg/s)		20,779.12	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	2,336.11	(mg/s)		2,336.11	(mg/s)		2,336.11	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	8,603.45	(mg/s)		8,603.45	(mg/s)		8,603.45	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	244.23	(mg/s)		1,671.68	(mg/s)		16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	40,674.05	(mg/s)		100,290.87	(mg/s)		187,630.33	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	7.252	(mg/L)		4.280	(mg/l)		4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	115.384	(mg/L)		40.122	(mg/l)		7.710	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000934618	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.14	(mg/s)		0.59	(mg/s)		4.96	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 8**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.029073121	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.02	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3.94	(mg/s)		3.94	(mg/s)		3.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.81	(mg/s)		0.81	(mg/s)		0.81	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.43	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	6.58	(mg/s)		40.29	(mg/s)		389.65	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.013	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.019	(mg/L)		0.016	(mg/L)		0.016	(mg/L)

Appendix F.4

Embarrass River

Proposed Action

Year 9

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

FLOWS

Case Flows	Year 9 Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	1.19	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	12.93	(cfs)	PM-13
	flow check	Q_ck_L =	12.93	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.26	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	5.26	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.01	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Year 9 Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	88.80	(cfs)	PM-13
	flow check	Q_ck_M =	88.80	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	5.26	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.01	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Year 9 High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	860.35	(cfs)	PM-13
	flow check	Q_ck_H =	860.35	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	5.26	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.01	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Silver**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00090	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.14	(mg/s)		0.38	(mg/s)		2.78	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Aluminum**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.12	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.12	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.12	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.07E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	43	(mg/s)	486	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)	0.61	(mg/s)	0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.12	(mg/s)	1.12	(mg/s)	1.12	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	209	(mg/s)	2,386	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)	2.98	(mg/s)	2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.10	(mg/s)	0.75	(mg/s)	0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	15.88	(mg/s)	15.88	(mg/s)	15.88	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	89.13	(mg/s)	89.13	(mg/s)	89.13	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.73	(mg/s)	44.55	(mg/s)	487.90	(mg/s)
	mass flux in river at PM-13	M_r13 =	109.89	(mg/s)	362.31	(mg/s)	2,982.50	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.051	(mg/L)	0.114	(mg/L)	0.119	(mg/L)
	concentration in river at PM-13	C_r13 =	0.300	(mg/L)	0.144	(mg/L)	0.122	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Arsenic**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.007592467	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0	(mg/s)		3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1	(mg/s)		15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)		0.33	(mg/s)		0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.13	(mg/s)		1.13	(mg/s)		1.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.16	(mg/s)		0.16	(mg/s)		0.16	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.34	(mg/s)		3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.70	(mg/s)		3.34	(mg/s)		19.72	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.005	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Boron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.027	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.027	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.027	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.145082047	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		10	(mg/s)		109	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)		0.52	(mg/s)		0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.25	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		47	(mg/s)		537	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)		2.53	(mg/s)		2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.97	(mg/s)		7.41	(mg/s)		7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	21.59	(mg/s)		21.59	(mg/s)		21.59	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	18.63	(mg/s)		18.63	(mg/s)		18.63	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.77	(mg/s)		10.40	(mg/s)		110.16	(mg/s)
	mass flux in river at PM-13	M_r13 =	44.52	(mg/s)		107.61	(mg/s)		697.15	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.023	(mg/L)		0.027	(mg/L)		0.027	(mg/L)
	concentration in river at PM-13	C_r13 =	0.122	(mg/L)		0.043	(mg/L)		0.029	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Barium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.05E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	6	(mg/s)	65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)	1.66	(mg/s)	1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)	0.15	(mg/s)	0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	28	(mg/s)	318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)	8.11	(mg/s)	8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	7.51	(mg/s)	7.51	(mg/s)	7.51	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	5.25	(mg/s)	5.25	(mg/s)	5.25	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.81	(mg/s)	7.52	(mg/s)	66.63	(mg/s)
	mass flux in river at PM-13	M_r13 =	22.72	(mg/s)	56.50	(mg/s)	405.86	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.054	(mg/L)	0.019	(mg/L)	0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.062	(mg/L)	0.022	(mg/L)	0.017	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Beryllium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00056357	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.08	(mg/s)		0.08	(mg/s)		0.08	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.13	(mg/s)		0.35	(mg/s)		2.53	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Calcium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	15	(mg/L)
	concentration of surface water into PM-13	C_s13 =	15	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	15	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	75.53238205	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	5,352.95	(mg/s)	60,771	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)	462.42	(mg/s)	462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	140.09	(mg/s)	140.09	(mg/s)	140.09	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	26,119.49	(mg/s)	298,224	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)	2,263.72	(mg/s)	2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	701.59	(mg/s)	5,369.83	(mg/s)	5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	11,239.50	(mg/s)	11,239.50	(mg/s)	11,239.50	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	156.22	(mg/s)	156.22	(mg/s)	156.22	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,374.76	(mg/s)	3,374.76	(mg/s)	22.45	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	602.51	(mg/s)	5,955.45	(mg/s)	61,373.93	(mg/s)
	mass flux in river at PM-13	M_r13 =	18,338.29	(mg/s)	54,478.96	(mg/s)	378,649.62	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	17.891	(mg/L)	15.249	(mg/L)	15.024	(mg/l)
	concentration in river at PM-13	C_r13 =	50.131	(mg/L)	21.679	(mg/L)	15.552	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Cadmium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000407879	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.03	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.14	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.06	(mg/s)	0.06	(mg/s)	0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)	0.04	(mg/s)	0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.12	(mg/s)	0.29	(mg/s)	2.04	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Chloride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.5	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.5	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.5	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.89E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	2,319.61	(mg/s)	26,334	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)	43.81	(mg/s)	43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	60.70	(mg/s)	60.70	(mg/s)	60.70	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	11,318.44	(mg/s)	129,230	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)	214.46	(mg/s)	214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	43.78	(mg/s)	335.09	(mg/s)	335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	876.22	(mg/s)	876.22	(mg/s)	876.22	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	660.93	(mg/s)	660.93	(mg/s)	660.93	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,216.00	(mg/s)	1,216.00	(mg/s)	1,216.00	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	104.51	(mg/s)	2,424.12	(mg/s)	26,438.79	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,115.90	(mg/s)	17,045.26	(mg/s)	158,971.88	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	3.103	(mg/L)	6.207	(mg/L)	6.472	(mg/L)
	concentration in river at PM-13	C_r13 =	8.518	(mg/L)	6.783	(mg/L)	6.529	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Cobalt**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.002481389	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.21	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.04	(mg/s)		12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.37	(mg/s)		0.37	(mg/s)		0.37	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.25	(mg/s)		2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.63	(mg/s)		1.91	(mg/s)		15.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Copper**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.008625606	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.54	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.61	(mg/s)		30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)		0.48	(mg/s)		0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)		0.19	(mg/s)		0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.28	(mg/s)		1.28	(mg/s)		1.28	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.26	(mg/s)		0.26	(mg/s)		0.26	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.11	(mg/s)		0.65	(mg/s)		6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.15	(mg/s)		5.47	(mg/s)		38.22	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)		0.002	(mg/L)		0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.006	(mg/L)		0.002	(mg/L)		0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.2	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.2	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.2	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.91E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		71.37	(mg/s)		810	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.87	(mg/s)		1.87	(mg/s)		1.87	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		348.26	(mg/s)		3,976	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)		45.87	(mg/s)		45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.92	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	102.84	(mg/s)		102.84	(mg/s)		102.84	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	1.07	(mg/s)		1.07	(mg/s)		1.07	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	87.50	(mg/s)		87.50	(mg/s)		87.50	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	11.24	(mg/s)		82.61	(mg/s)		821.52	(mg/s)
	mass flux in river at PM-13	M_r13 =	249.44	(mg/s)		675.19	(mg/s)		5,042.16	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.334	(mg/L)		0.212	(mg/L)		0.201	(mg/L)
	concentration in river at PM-13	C_r13 =	0.682	(mg/L)		0.269	(mg/L)		0.207	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Iron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.91E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,034.90	(mg/s)		11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)		0.85	(mg/s)		0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	27.08	(mg/s)		27.08	(mg/s)		27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		5,049.77	(mg/s)		57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)		4.17	(mg/s)		4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.28	(mg/s)		2.13	(mg/s)		2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	8.80	(mg/s)		8.80	(mg/s)		8.80	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	259.35	(mg/s)		259.35	(mg/s)		259.35	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	27.93	(mg/s)		1,062.84	(mg/s)		11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	300.68	(mg/s)		6,387.20	(mg/s)		69,708.30	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.829	(mg/L)		2.721	(mg/L)		2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.822	(mg/L)		2.542	(mg/L)		2.863	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Hardness**

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	2.56E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	24,980.41	(mg/s)	283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)	2,129.58	(mg/s)	2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	653.73	(mg/s)	653.73	(mg/s)	653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	121,890.93	(mg/s)	1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)	10,425.01	(mg/s)	10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	6,936.49	(mg/s)	53,090.84	(mg/s)	53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	38,042.63	(mg/s)	38,042.63	(mg/s)	38,042.63	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	3,233.31	(mg/s)	3,233.31	(mg/s)	3,233.31	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	24,647.41	(mg/s)	24,647.41	(mg/s)	24,647.41	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,783.31	(mg/s)	27,763.72	(mg/s)	286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	86,068.16	(mg/s)	279,093.85	(mg/s)	1,807,534.40	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	82.647	(mg/L)	71.091	(mg/L)	70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	235.281	(mg/L)	111.063	(mg/L)	74.238	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 9
Parameter	Potassium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.60	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.60	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.60	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	7.04	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		214.12	(mg/s)		2,431	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.68	(mg/s)		5.60	(mg/s)		0.68	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1,044.78	(mg/s)		11,929	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	5.60	(mg/s)		3,029.85	(mg/s)		5.60	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	395.86	(mg/s)		1,048.24	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,048.24	(mg/s)		0.68	(mg/s)		1,048.24	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	438.64	(mg/s)		438.64	(mg/s)		438.64	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.62	(mg/s)		258.66	(mg/s)		2,470.47	(mg/s)
	mass flux in river at PM-13	M_r13 =	2,118.59	(mg/s)		6,011.48	(mg/s)		19,112.40	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.176	(mg/L)		0.662	(mg/L)		0.605	(mg/l)
	concentration in river at PM-13	C_r13 =	5.791	(mg/L)		2.392	(mg/L)		0.785	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Magnesium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	5.90	(mg/L)
	concentration of surface water into PM-13	C_s13 =	5.90	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	5.90	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	16.28	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,105.49	(mg/s)		23,903	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	55.10	(mg/s)		55.10	(mg/s)		55.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,273.66	(mg/s)		117,301	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)		1,268.87	(mg/s)		1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	1,994.02	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2,422.93	(mg/s)		2,422.93	(mg/s)		2,422.93	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	79.99	(mg/s)		79.99	(mg/s)		79.99	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,950.02	(mg/s)		3,950.02	(mg/s)		3,950.02	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	314.30	(mg/s)		2,419.79	(mg/s)		24,217.73	(mg/s)
	mass flux in river at PM-13	M_r13 =	10,030.13	(mg/s)		35,677.17	(mg/s)		164,502.88	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	9.333	(mg/L)		6.196	(mg/L)		5.928	(mg/l)
	concentration in river at PM-13	C_r13 =	27.419	(mg/L)		14.197	(mg/L)		6.756	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Manganese**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.29	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	2.80	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)		22.40	(mg/s)		22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	3.57	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	42.96	(mg/s)		42.96	(mg/s)		42.96	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	66.78	(mg/s)		66.78	(mg/s)		66.78	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	7.38	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	143.09	(mg/s)		796.28	(mg/s)		7,346.74	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.219	(mg/L)		0.293	(mg/L)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.391	(mg/L)		0.317	(mg/L)		0.302	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Sodium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	22.11	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	56.03	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)		583.80	(mg/s)		583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	879.28	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3,289.71	(mg/s)		3,289.71	(mg/s)		3,289.71	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	95.76	(mg/s)		95.76	(mg/s)		95.76	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,501.44	(mg/s)		2,501.44	(mg/s)		2,501.44	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	175.29	(mg/s)		2,316.47	(mg/s)		24,483.86	(mg/s)
	mass flux in river at PM-13	M_r13 =	7,525.28	(mg/s)		25,964.85	(mg/s)		156,974.04	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	5.205	(mg/L)		5.931	(mg/L)		5.993	(mg/l)
	concentration in river at PM-13	C_r13 =	20.572	(mg/L)		10.332	(mg/L)		6.447	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.041162911	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.43	(mg/s)		5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.09	(mg/s)		24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)		0.83	(mg/s)		0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.04	(mg/s)		0.29	(mg/s)		0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	6.13	(mg/s)		6.13	(mg/s)		6.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.39	(mg/s)		0.39	(mg/s)		0.39	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.18	(mg/s)		0.61	(mg/s)		5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	7.60	(mg/s)		10.38	(mg/s)		36.58	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.005	(mg/L)		0.002	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.021	(mg/L)		0.004	(mg/L)		0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Lead**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001749429	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.05	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.26	(mg/s)		3	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)		0.14	(mg/s)		0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.26	(mg/s)		0.26	(mg/s)		0.26	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.08	(mg/s)		0.64	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.50	(mg/s)		0.83	(mg/s)		4.11	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Antimony**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	8.83E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.01	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)		0.18	(mg/s)		0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.31	(mg/s)		1.31	(mg/s)		1.31	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)		0.05	(mg/s)		0.20	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.55	(mg/s)		1.64	(mg/s)		2.52	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.004	(mg/L)		0.001	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Selenium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001403839	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.11	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.52	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)		0.35	(mg/s)		0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.21	(mg/s)		0.21	(mg/s)		0.21	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.02	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.18	(mg/s)		1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.73	(mg/s)		1.44	(mg/s)		7.99	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)		0.001	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	166.62	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	1,427.45	(mg/s)	16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)	206.87	(mg/s)	206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	37.36	(mg/s)	37.36	(mg/s)	37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	6,965.20	(mg/s)	79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)	1,012.72	(mg/s)	1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	7,698.43	(mg/s)	58,922.60	(mg/s)	58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	24,792.97	(mg/s)	24,792.97	(mg/s)	24,792.97	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	2,759.02	(mg/s)	2,759.02	(mg/s)	2,759.02	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	8,603.45	(mg/s)	8,603.45	(mg/s)	8,603.45	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	244.23	(mg/s)	1,671.68	(mg/s)	16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	45,110.81	(mg/s)	104,727.62	(mg/s)	192,067.08	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	7.252	(mg/L)	4.280	(mg/L)	4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	123.317	(mg/L)	41.675	(mg/L)	7.888	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000967503	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.14	(mg/s)		0.14	(mg/s)		0.14	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.16	(mg/s)		0.61	(mg/s)		4.98	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 9**
Parameter	**Zinc**

Input concentration data				
	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.039738069	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.02	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	5.91	(mg/s)		5.91	(mg/s)		5.91	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.81	(mg/s)		0.81	(mg/s)		0.81	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.43	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	8.55	(mg/s)		42.27	(mg/s)		391.62	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.013	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.023	(mg/L)		0.017	(mg/L)		0.016	(mg/L)

Appendix F.5

Embarrass River

Proposed Action

Year 15

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

FLOWS

Case Flows	Year 15 Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	1.19	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	13.32	(cfs)	PM-13
	flow check	Q_ck_L =	13.32	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.26	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	5.65	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Year 15 Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	89.19	(cfs)	PM-13
	flow check	Q_ck_M =	89.19	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	5.65	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Year 15 High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	860.74	(cfs)	PM-13
	flow check	Q_ck_H =	860.74	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	5.65	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Silver**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00122	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000000	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.19	(mg/s)		0.19	(mg/s)		0.19	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.20	(mg/s)		0.44	(mg/s)		2.84	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Aluminum**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.12	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.12	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.12	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	4.43E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	42.82	(mg/s)	486	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)	0.61	(mg/s)	0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.12	(mg/s)	1.12	(mg/s)	1.12	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	208.96	(mg/s)	2,386	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.10	(mg/s)	0.75	(mg/s)	0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	70.86	(mg/s)	70.86	(mg/s)	70.86	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.09	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	89.13	(mg/s)	89.13	(mg/s)	89.13	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.73	(mg/s)	44.55	(mg/s)	487.90	(mg/s)
	mass flux in river at PM-13	M_r13 =	161.90	(mg/s)	414.33	(mg/s)	3,034.51	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.051	(mg/L)	0.114	(mg/L)	0.119	(mg/L)
	concentration in river at PM-13	C_r13 =	0.430	(mg/L)	0.164	(mg/L)	0.125	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Arsenic**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.015514819	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.27	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.31	(mg/s)	15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2.48	(mg/s)	2.48	(mg/s)	2.48	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.16	(mg/s)	0.16	(mg/s)	0.16	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.34	(mg/s)	3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.73	(mg/s)	4.37	(mg/s)	20.74	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.007	(mg/L)	0.002	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 15
Parameter	Boron

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.027	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.027	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.027	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.173169588	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		9.64	(mg/s)		109	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)		0.52	(mg/s)		0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.25	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		47.02	(mg/s)		537	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.97	(mg/s)		7.41	(mg/s)		7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	27.67	(mg/s)		27.67	(mg/s)		27.67	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	18.63	(mg/s)		18.63	(mg/s)		18.63	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.77	(mg/s)		10.40	(mg/s)		110.16	(mg/s)
	mass flux in river at PM-13	M_r13 =	48.09	(mg/s)		111.18	(mg/s)		700.72	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.023	(mg/L)		0.027	(mg/L)		0.027	(mg/L)
	concentration in river at PM-13	C_r13 =	0.128	(mg/L)		0.044	(mg/L)		0.029	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Barium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.35E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	5.71	(mg/s)	65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)	1.66	(mg/s)	1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)	0.15	(mg/s)	0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	27.86	(mg/s)	318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	10.14	(mg/s)	10.14	(mg/s)	10.14	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	5.25	(mg/s)	5.25	(mg/s)	5.25	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.81	(mg/s)	7.52	(mg/s)	66.63	(mg/s)
	mass flux in river at PM-13	M_r13 =	17.23	(mg/s)	51.02	(mg/s)	400.37	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.054	(mg/L)	0.019	(mg/L)	0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.046	(mg/L)	0.020	(mg/L)	0.016	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Beryllium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001410903	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.04	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.17	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.23	(mg/s)	0.23	(mg/s)	0.23	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)	0.04	(mg/s)	0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.27	(mg/s)	0.48	(mg/s)	2.67	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Calcium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	15	(mg/L)
	concentration of surface water into PM-13	C_s13 =	15	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	15	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	95.38057957	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	5,352.95	(mg/s)	60,771	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)	462.42	(mg/s)	462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	140.09	(mg/s)	140.09	(mg/s)	140.09	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	26,119.49	(mg/s)	298,224	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	701.59	(mg/s)	5,369.83	(mg/s)	5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	15,242.69	(mg/s)	15,242.69	(mg/s)	15,242.69	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	205.46	(mg/s)	205.46	(mg/s)	205.46	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,374.76	(mg/s)	3,374.76	(mg/s)	29.52	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	602.51	(mg/s)	5,955.45	(mg/s)	61,373.93	(mg/s)
	mass flux in river at PM-13	M_r13 =	20,127.01	(mg/s)	56,267.68	(mg/s)	380,445.41	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	17.891	(mg/L)	15.249	(mg/l)	15.024	(mg/l)
	concentration in river at PM-13	C_r13 =	53.397	(mg/L)	22.293	(mg/l)	15.618	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Cadmium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000705708	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.03	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.14	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.11	(mg/s)		0.11	(mg/s)		0.11	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)		0.04	(mg/s)		0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.13	(mg/s)		0.31	(mg/s)		2.05	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Chloride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.5	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.5	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.5	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	7.60E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	2,319.61	(mg/s)	26,334	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)	43.81	(mg/s)	43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	60.70	(mg/s)	60.70	(mg/s)	60.70	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	11,318.44	(mg/s)	129,230	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	43.78	(mg/s)	335.09	(mg/s)	335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,215.25	(mg/s)	1,215.25	(mg/s)	1,215.25	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	869.24	(mg/s)	869.24	(mg/s)	869.24	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,216.00	(mg/s)	1,216.00	(mg/s)	1,216.00	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	104.51	(mg/s)	2,424.12	(mg/s)	26,438.79	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,448.78	(mg/s)	17,378.14	(mg/s)	159,304.77	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	3.103	(mg/L)	6.207	(mg/L)	6.472	(mg/L)
	concentration in river at PM-13	C_r13 =	9.150	(mg/L)	6.885	(mg/L)	6.540	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Cobalt**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.008661931	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.21	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.04	(mg/s)	12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.38	(mg/s)	1.38	(mg/s)	1.38	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.09	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.25	(mg/s)	2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.51	(mg/s)	2.80	(mg/s)	15.90	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.004	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Copper**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.020766721	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.54	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.61	(mg/s)	30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)	0.19	(mg/s)	0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3.32	(mg/s)	3.32	(mg/s)	3.32	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.26	(mg/s)	0.26	(mg/s)	0.26	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.11	(mg/s)	0.65	(mg/s)	6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	3.71	(mg/s)	7.03	(mg/s)	39.78	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.0017	(mg/L)	0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.010	(mg/L)	0.0028	(mg/L)	0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.2	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.2	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.2	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	8.26E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		71.37	(mg/s)		810	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.87	(mg/s)		1.87	(mg/s)		1.87	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		348.26	(mg/s)		3,976	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.92	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	132.08	(mg/s)		132.08	(mg/s)		132.08	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	1.41	(mg/s)		1.41	(mg/s)		1.41	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	87.50	(mg/s)		87.50	(mg/s)		87.50	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	11.24	(mg/s)		82.61	(mg/s)		821.52	(mg/s)
	mass flux in river at PM-13	M_r13 =	233.15	(mg/s)		658.90	(mg/s)		5,025.87	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.334	(mg/L)		0.212	(mg/L)		0.201	(mg/L)
	concentration in river at PM-13	C_r13 =	0.619	(mg/L)		0.261	(mg/L)		0.206	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Iron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	9.82E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	1,034.90	(mg/s)	11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)	0.85	(mg/s)	0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	27.08	(mg/s)	27.08	(mg/s)	27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	5,049.77	(mg/s)	57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.28	(mg/s)	2.13	(mg/s)	2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	15.69	(mg/s)	15.69	(mg/s)	15.69	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.20	(mg/s)	0.20	(mg/s)	0.20	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	259.35	(mg/s)	259.35	(mg/s)	259.35	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	27.93	(mg/s)	1,062.84	(mg/s)	11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	303.44	(mg/s)	6,389.96	(mg/s)	69,711.07	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.829	(mg/L)	2.721	(mg/L)	2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.805	(mg/L)	2.532	(mg/L)	2.862	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Hardness**

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	3.20E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	24,980.41	(mg/s)	283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)	2,129.58	(mg/s)	2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	653.73	(mg/s)	653.73	(mg/s)	653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	121,890.93	(mg/s)	1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	6,936.49	(mg/s)	53,090.84	(mg/s)	53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	51,106.04	(mg/s)	51,106.04	(mg/s)	51,106.04	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	4,252.38	(mg/s)	4,252.38	(mg/s)	4,252.38	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	24,647.41	(mg/s)	24,647.41	(mg/s)	24,647.41	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,783.31	(mg/s)	27,763.72	(mg/s)	286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	89,725.62	(mg/s)	282,751.31	(mg/s)	1,811,191.86	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	82.647	(mg/L)	71.091	(mg/L)	70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	238.041	(mg/L)	112.023	(mg/L)	74.354	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 15
Parameter	Potassium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.60	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.60	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.60	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	14.58	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	214.12	(mg/s)	2,431	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)	38.94	(mg/s)	38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.89	(mg/s)	0.89	(mg/s)	0.89	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1,044.78	(mg/s)	11,929	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	5.60	(mg/s)	5.60	(mg/s)	5.60	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	395.86	(mg/s)	3,029.85	(mg/s)	3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2,330.24	(mg/s)	2,330.24	(mg/s)	2,330.24	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	438.64	(mg/s)	438.64	(mg/s)	438.64	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.83	(mg/s)	253.95	(mg/s)	2,470.69	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,210.18	(mg/s)	7,103.07	(mg/s)	20,203.99	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.183	(mg/L)	0.650	(mg/L)	0.605	(mg/l)
	concentration in river at PM-13	C_r13 =	8.517	(mg/L)	2.814	(mg/L)	0.829	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Magnesium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	5.90	(mg/L)
	concentration of surface water into PM-13	C_s13 =	5.90	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	5.90	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	19.82	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,105.49	(mg/s)		23,903	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	55.10	(mg/s)		55.10	(mg/s)		55.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,273.66	(mg/s)		117,301	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	1,994.02	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3,167.81	(mg/s)		3,167.81	(mg/s)		3,167.81	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	105.20	(mg/s)		105.20	(mg/s)		105.20	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,950.02	(mg/s)		3,950.02	(mg/s)		3,950.02	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	314.30	(mg/s)		2,419.79	(mg/s)		24,217.73	(mg/s)
	mass flux in river at PM-13	M_r13 =	9,531.35	(mg/s)		35,178.39	(mg/s)		164,004.09	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	9.333	(mg/L)		6.196	(mg/l)		5.928	(mg/l)
	concentration in river at PM-13	C_r13 =	25.287	(mg/L)		13.937	(mg/l)		6.733	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Manganese**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.43	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	2.80	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	3.57	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	69.10	(mg/s)		69.10	(mg/s)		69.10	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	66.78	(mg/s)		66.78	(mg/s)		66.78	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	7.38	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	146.83	(mg/s)		800.03	(mg/s)		7,350.49	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.219	(mg/L)		0.293	(mg/l)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.390	(mg/L)		0.317	(mg/l)		0.302	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Sodium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	22.52	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	2,141.18	(mg/s)	24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)	119.26	(mg/s)	119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	56.03	(mg/s)	56.03	(mg/s)	56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	10,447.79	(mg/s)	119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	879.28	(mg/s)	6,729.88	(mg/s)	6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3,599.56	(mg/s)	3,599.56	(mg/s)	3,599.56	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	125.94	(mg/s)	125.94	(mg/s)	125.94	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,501.44	(mg/s)	2,501.44	(mg/s)	2,501.44	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	175.29	(mg/s)	2,316.47	(mg/s)	24,483.86	(mg/s)
	mass flux in river at PM-13	M_r13 =	7,281.51	(mg/s)	25,721.08	(mg/s)	156,730.27	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	5.205	(mg/L)	5.931	(mg/l)	5.993	(mg/l)
	concentration in river at PM-13	C_r13 =	19.318	(mg/L)	10.190	(mg/l)	6.434	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Nickel**

Input concentration data				
	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.153655831	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.43	(mg/s)		5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.09	(mg/s)		24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.04	(mg/s)		0.29	(mg/s)		0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	24.56	(mg/s)		24.56	(mg/s)		24.56	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.39	(mg/s)		0.39	(mg/s)		0.39	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.18	(mg/s)		0.61	(mg/s)		5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	25.21	(mg/s)		27.98	(mg/s)		54.19	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.005	(mg/L)		0.002	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.067	(mg/L)		0.011	(mg/L)		0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Lead**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.002409879	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.05	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.26	(mg/s)		3	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.39	(mg/s)		0.39	(mg/s)		0.39	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.08	(mg/s)		0.64	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.49	(mg/s)		0.82	(mg/s)		4.09	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Antimony**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.13E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00E+00	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.01	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.07	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.81	(mg/s)	1.81	(mg/s)	1.81	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)	0.05	(mg/s)	0.20	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.87	(mg/s)	1.96	(mg/s)	2.84	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.005	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Selenium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.002521801	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.11	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.52	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.40	(mg/s)	0.40	(mg/s)	0.40	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)	0.06	(mg/s)	0.06	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.18	(mg/s)	1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.58	(mg/s)	1.29	(mg/s)	7.84	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	241.92	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	1,427.45	(mg/s)	16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)	206.87	(mg/s)	206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	37.36	(mg/s)	37.36	(mg/s)	37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	6,965.20	(mg/s)	79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	7,698.43	(mg/s)	58,922.60	(mg/s)	58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	38,661.16	(mg/s)	38,661.16	(mg/s)	38,661.16	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	3,628.60	(mg/s)	3,628.60	(mg/s)	3,628.60	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	8,603.45	(mg/s)	8,603.45	(mg/s)	8,603.45	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	244.23	(mg/s)	1,671.68	(mg/s)	16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	58,835.87	(mg/s)	118,452.69	(mg/s)	205,792.15	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	7.252	(mg/L)	4.280	(mg/l)	4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	156.091	(mg/L)	46.930	(mg/l)	8.448	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001193197	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.07	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.35	(mg/s)	4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.19	(mg/s)	0.19	(mg/s)	0.19	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)	0.07	(mg/s)	0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.21	(mg/s)	0.66	(mg/s)	5.02	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 15**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.081197396	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.02	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	12.98	(mg/s)		12.98	(mg/s)		12.98	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.81	(mg/s)		0.81	(mg/s)		0.81	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.43	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	14.24	(mg/s)		47.96	(mg/s)		397.32	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.013	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.038	(mg/L)		0.019	(mg/L)		0.016	(mg/L)

Appendix F.6

Embarrass River

Proposed Action

Year 20

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

FLOWS

Case Flows	Year 20 Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	1.19	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	13.64	(cfs)	PM-13
	flow check	Q_ck_L =	13.64	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.26	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	5.97	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Year 20 Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	89.51	(cfs)	PM-13
	flow check	Q_ck_M =	89.51	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	5.97	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Year 20 High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	861.06	(cfs)	PM-13
	flow check	Q_ck_H =	861.06	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	5.97	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Silver**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00124	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.21	(mg/s)		0.21	(mg/s)		0.21	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.22	(mg/s)		0.46	(mg/s)		2.86	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Aluminum**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.12	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.12	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.12	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	3.74E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		42.82	(mg/s)		486	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)		0.61	(mg/s)		0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.12	(mg/s)		1.12	(mg/s)		1.12	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		208.96	(mg/s)		2,386	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)		2.98	(mg/s)		2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.10	(mg/s)		0.75	(mg/s)		0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	63.12	(mg/s)		63.12	(mg/s)		63.12	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.10	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	89.10	(mg/s)		89.10	(mg/s)		89.10	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.73	(mg/s)		44.55	(mg/s)		487.90	(mg/s)
	mass flux in river at PM-13	M_r13 =	157.12	(mg/s)		409.55	(mg/s)		3,029.73	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.051	(mg/L)		0.114	(mg/L)		0.119	(mg/L)
	concentration in river at PM-13	C_r13 =	0.407	(mg/L)		0.162	(mg/L)		0.124	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Arsenic**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.014389887	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.27	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.31	(mg/s)	15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)	0.33	(mg/s)	0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2.43	(mg/s)	2.43	(mg/s)	2.43	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.16	(mg/s)	0.16	(mg/s)	0.16	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.34	(mg/s)	3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	3.01	(mg/s)	4.64	(mg/s)	21.02	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.008	(mg/L)	0.002	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Year 20
Parameter	Boron

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.027	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.027	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.027	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.174123916	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		9.64	(mg/s)		109	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)		0.52	(mg/s)		0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.25	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		47.02	(mg/s)		537	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)		2.53	(mg/s)		2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.97	(mg/s)		7.41	(mg/s)		7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	29.42	(mg/s)		29.42	(mg/s)		29.42	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	18.62	(mg/s)		18.62	(mg/s)		18.62	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.77	(mg/s)		10.40	(mg/s)		110.16	(mg/s)
	mass flux in river at PM-13	M_r13 =	52.37	(mg/s)		115.46	(mg/s)		705.00	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.023	(mg/L)		0.027	(mg/L)		0.027	(mg/L)
	concentration in river at PM-13	C_r13 =	0.136	(mg/L)		0.046	(mg/L)		0.029	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Barium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.60E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	5.71	(mg/s)	65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)	1.66	(mg/s)	1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)	0.15	(mg/s)	0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	27.86	(mg/s)	318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)	8.11	(mg/s)	8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	11.15	(mg/s)	11.15	(mg/s)	11.15	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	5.25	(mg/s)	5.25	(mg/s)	5.25	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.81	(mg/s)	7.52	(mg/s)	66.63	(mg/s)
	mass flux in river at PM-13	M_r13 =	26.36	(mg/s)	60.14	(mg/s)	409.50	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.054	(mg/L)	0.019	(mg/L)	0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.068	(mg/L)	0.024	(mg/L)	0.017	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Beryllium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00131326	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.04	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.17	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.22	(mg/s)	0.22	(mg/s)	0.22	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)	-	(mg/s)	-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)	0.04	(mg/s)	0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.27	(mg/s)	0.48	(mg/s)	2.67	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Calcium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	15	(mg/L)
	concentration of surface water into PM-13	C_s13 =	15	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	15	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	76.37590202	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5,352.95	(mg/s)		60,771	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)		462.42	(mg/s)		462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	140.09	(mg/s)		140.09	(mg/s)		140.09	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		26,119.49	(mg/s)		298,224	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)		2,263.72	(mg/s)		2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	701.59	(mg/s)		5,369.83	(mg/s)		5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	12,906.03	(mg/s)		12,906.03	(mg/s)		12,906.03	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	227.25	(mg/s)		227.25	(mg/s)		227.25	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,373.51	(mg/s)		3,373.51	(mg/s)		32.66	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	602.51	(mg/s)		5,955.45	(mg/s)		61,373.93	(mg/s)
	mass flux in river at PM-13	M_r13 =	20,074.61	(mg/s)		56,215.28	(mg/s)		380,397.40	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	17.891	(mg/L)		15.249	(mg/l)		15.024	(mg/l)
	concentration in river at PM-13	C_r13 =	51.988	(mg/L)		22.191	(mg/l)		15.610	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Cadmium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000534314	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.03	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.14	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.09	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)	0.04	(mg/s)	0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.15	(mg/s)	0.32	(mg/s)	2.07	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Chloride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.5	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.5	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.5	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	7.66E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,319.61	(mg/s)		26,334	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)		43.81	(mg/s)		43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	60.70	(mg/s)		60.70	(mg/s)		60.70	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		11,318.44	(mg/s)		129,230	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)		214.46	(mg/s)		214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	43.78	(mg/s)		335.09	(mg/s)		335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,293.94	(mg/s)		1,293.94	(mg/s)		1,293.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	961.45	(mg/s)		961.45	(mg/s)		961.45	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,215.55	(mg/s)		1,215.55	(mg/s)		1,215.55	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	104.51	(mg/s)		2,424.12	(mg/s)		26,438.79	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,833.69	(mg/s)		17,763.05	(mg/s)		159,689.67	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	3.103	(mg/L)		6.207	(mg/L)		6.472	(mg/L)
	concentration in river at PM-13	C_r13 =	9.928	(mg/L)		7.012	(mg/L)		6.553	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Cobalt**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.007940593	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.21	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.04	(mg/s)		12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.34	(mg/s)		1.34	(mg/s)		1.34	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.25	(mg/s)		2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.60	(mg/s)		2.89	(mg/s)		15.99	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.004	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Copper**

Input concentration data				
	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.020208301	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.54	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.61	(mg/s)	30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)	0.48	(mg/s)	0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)	0.19	(mg/s)	0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3.41	(mg/s)	3.41	(mg/s)	3.41	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.26	(mg/s)	0.26	(mg/s)	0.26	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.11	(mg/s)	0.65	(mg/s)	6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	4.29	(mg/s)	7.60	(mg/s)	40.35	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.002	(mg/L)	0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.011	(mg/L)	0.003	(mg/L)	0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.2	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.2	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.2	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	7.70E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		71.37	(mg/s)		810	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.87	(mg/s)		1.87	(mg/s)		1.87	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		348.26	(mg/s)		3,976	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)		45.87	(mg/s)		45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.92	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	130.19	(mg/s)		130.19	(mg/s)		130.19	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	1.56	(mg/s)		1.56	(mg/s)		1.56	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	87.47	(mg/s)		87.47	(mg/s)		87.47	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	11.24	(mg/s)		82.61	(mg/s)		821.52	(mg/s)
	mass flux in river at PM-13	M_r13 =	277.25	(mg/s)		703.00	(mg/s)		5,069.97	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.334	(mg/L)		0.212	(mg/L)		0.201	(mg/L)
	concentration in river at PM-13	C_r13 =	0.718	(mg/L)		0.278	(mg/L)		0.208	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Iron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	8.72E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,034.90	(mg/s)		11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)		0.85	(mg/s)		0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	27.08	(mg/s)		27.08	(mg/s)		27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		5,049.77	(mg/s)		57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)		4.17	(mg/s)		4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.28	(mg/s)		2.13	(mg/s)		2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	14.74	(mg/s)		14.74	(mg/s)		14.74	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.22	(mg/s)		0.22	(mg/s)		0.22	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	259.25	(mg/s)		259.25	(mg/s)		259.25	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	27.93	(mg/s)		1,062.84	(mg/s)		11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	306.59	(mg/s)		6,393.11	(mg/s)		69,714.22	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.829	(mg/L)		2.721	(mg/L)		2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.794	(mg/L)		2.524	(mg/L)		2.861	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Hardness**

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	2.71E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	24,980.41	(mg/s)	283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)	2,129.58	(mg/s)	2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	653.73	(mg/s)	653.73	(mg/s)	653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	121,890.93	(mg/s)	1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)	10,425.01	(mg/s)	10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	6,936.49	(mg/s)	53,090.84	(mg/s)	53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	45,758.38	(mg/s)	45,758.38	(mg/s)	45,758.38	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	4,703.46	(mg/s)	4,703.46	(mg/s)	4,703.46	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	24,638.27	(mg/s)	24,638.27	(mg/s)	24,638.27	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,783.31	(mg/s)	27,763.72	(mg/s)	286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	95,244.92	(mg/s)	288,270.61	(mg/s)	1,816,711.16	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	82.647	(mg/L)	71.091	(mg/L)	70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	246.661	(mg/L)	113.794	(mg/L)	74.553	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Potassium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.60	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.60	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.60	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	13.45	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		214.12	(mg/s)		2,431	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.98	(mg/s)		0.98	(mg/s)		0.98	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1,044.78	(mg/s)		11,929	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	5.60	(mg/s)		5.60	(mg/s)		5.60	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	395.86	(mg/s)		3,029.85	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2,272.35	(mg/s)		2,272.35	(mg/s)		2,272.35	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	438.48	(mg/s)		438.48	(mg/s)		438.48	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.92	(mg/s)		254.04	(mg/s)		2,470.78	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,342.85	(mg/s)		7,235.74	(mg/s)		20,336.66	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.186	(mg/L)		0.650	(mg/L)		0.605	(mg/l)
	concentration in river at PM-13	C_r13 =	8.657	(mg/L)		2.856	(mg/L)		0.835	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Magnesium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	5.90	(mg/L)
	concentration of surface water into PM-13	C_s13 =	5.90	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	5.90	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	19.45	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,105.49	(mg/s)		23,903	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	55.10	(mg/s)		55.10	(mg/s)		55.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,273.66	(mg/s)		117,301	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)		1,268.87	(mg/s)		1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	1,994.02	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3,286.07	(mg/s)		3,286.07	(mg/s)		3,286.07	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	116.36	(mg/s)		116.36	(mg/s)		116.36	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,948.56	(mg/s)		3,948.56	(mg/s)		3,948.56	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	314.30	(mg/s)		2,419.79	(mg/s)		24,217.73	(mg/s)
	mass flux in river at PM-13	M_r13 =	10,928.17	(mg/s)		36,575.21	(mg/s)		165,400.92	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	9.333	(mg/L)		6.196	(mg/l)		5.928	(mg/l)
	concentration in river at PM-13	C_r13 =	28.301	(mg/L)		14.438	(mg/l)		6.788	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Manganese**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.45	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	2.80	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)		22.40	(mg/s)		22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	3.57	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	76.11	(mg/s)		76.11	(mg/s)		76.11	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	66.76	(mg/s)		66.76	(mg/s)		66.76	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	7.38	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	176.22	(mg/s)		829.41	(mg/s)		7,379.87	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.219	(mg/L)		0.293	(mg/l)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.456	(mg/L)		0.327	(mg/l)		0.303	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Sodium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	19.36	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	56.03	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)		583.80	(mg/s)		583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	879.28	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3,272.20	(mg/s)		3,272.20	(mg/s)		3,272.20	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	139.30	(mg/s)		139.30	(mg/s)		139.30	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,500.51	(mg/s)		2,500.51	(mg/s)		2,500.51	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	175.29	(mg/s)		2,316.47	(mg/s)		24,483.86	(mg/s)
	mass flux in river at PM-13	M_r13 =	7,550.38	(mg/s)		25,989.95	(mg/s)		156,999.14	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	5.205	(mg/L)		5.931	(mg/l)		5.993	(mg/l)
	concentration in river at PM-13	C_r13 =	19.554	(mg/L)		10.259	(mg/l)		6.443	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.141786777	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.43	(mg/s)		5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.09	(mg/s)		24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)		0.83	(mg/s)		0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.04	(mg/s)		0.29	(mg/s)		0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	23.96	(mg/s)		23.96	(mg/s)		23.96	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.39	(mg/s)		0.39	(mg/s)		0.39	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.18	(mg/s)		0.61	(mg/s)		5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	25.45	(mg/s)		28.23	(mg/s)		54.43	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.005	(mg/L)		0.002	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.066	(mg/L)		0.011	(mg/L)		0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Lead**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001841737	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.05	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.26	(mg/s)		3	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)		0.14	(mg/s)		0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.31	(mg/s)		0.31	(mg/s)		0.31	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.08	(mg/s)		0.64	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.55	(mg/s)		0.88	(mg/s)		4.16	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Antimony**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.02E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.01	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)		0.18	(mg/s)		0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.73	(mg/s)		1.73	(mg/s)		1.73	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)		0.05	(mg/s)		0.20	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.96	(mg/s)		2.06	(mg/s)		2.93	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.005	(mg/L)		0.001	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Selenium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.002326015	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.11	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.52	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)		0.35	(mg/s)		0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.39	(mg/s)		0.39	(mg/s)		0.39	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.18	(mg/s)		1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.92	(mg/s)		1.63	(mg/s)		8.18	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)		0.001	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	211.97	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,427.45	(mg/s)		16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)		206.87	(mg/s)		206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	37.36	(mg/s)		37.36	(mg/s)		37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,965.20	(mg/s)		79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)		1,012.72	(mg/s)		1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	7,698.43	(mg/s)		58,922.60	(mg/s)		58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	35,819.52	(mg/s)		35,819.52	(mg/s)		35,819.52	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	4,013.51	(mg/s)		4,013.51	(mg/s)		4,013.51	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	8,600.26	(mg/s)		8,600.26	(mg/s)		8,600.26	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	244.23	(mg/s)		1,671.68	(mg/s)		16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	57,388.66	(mg/s)		117,005.48	(mg/s)		204,344.94	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	7.252	(mg/L)		4.280	(mg/l)		4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	148.623	(mg/L)		46.188	(mg/l)		8.386	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001147722	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.19	(mg/s)		0.19	(mg/s)		0.19	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.21	(mg/s)		0.66	(mg/s)		5.03	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Year 20**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.061124366	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	5.71	(mg/s)	65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)	0.28	(mg/s)	0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)	0.15	(mg/s)	0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	27.86	(mg/s)	318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)	1.37	(mg/s)	1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.02	(mg/s)	0.17	(mg/s)	0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	10.33	(mg/s)	10.33	(mg/s)	10.33	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.81	(mg/s)	0.81	(mg/s)	0.81	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.43	(mg/s)	6.14	(mg/s)	65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	12.97	(mg/s)	46.68	(mg/s)	396.04	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.013	(mg/L)	0.016	(mg/L)	0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.034	(mg/L)	0.018	(mg/L)	0.016	(mg/L)

Appendix F.7

Embarrass River

Proposed Action

Closure

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

FLOWS

Case Flows	Closure Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	1.19	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	9.78	(cfs)	PM-13
	flow check	Q_ck_L =	9.78	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.26	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	2.45	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	1.67	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Closure Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	85.65	(cfs)	PM-13
	flow check	Q_ck_M =	85.65	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	2.45	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	1.67	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Closure High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	857.20	(cfs)	PM-13
	flow check	Q_ck_H =	857.20	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	2.45	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	1.67	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Silver**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00097	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.08	(mg/s)		0.31	(mg/s)		2.72	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Aluminum**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.12	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.12	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.12	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.37E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		42.82	(mg/s)		486	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)		0.61	(mg/s)		0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.12	(mg/s)		1.12	(mg/s)		1.12	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		208.96	(mg/s)		2,386	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)		2.98	(mg/s)		2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.10	(mg/s)		0.75	(mg/s)		0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	44.20	(mg/s)		44.20	(mg/s)		44.20	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	74.66	(mg/s)		74.66	(mg/s)		74.66	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.73	(mg/s)		44.55	(mg/s)		487.90	(mg/s)
	mass flux in river at PM-13	M_r13 =	123.68	(mg/s)		376.10	(mg/s)		2,996.29	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.051	(mg/L)		0.114	(mg/L)		0.119	(mg/L)
	concentration in river at PM-13	C_r13 =	0.447	(mg/L)		0.155	(mg/L)		0.124	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Arsenic**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.012359831	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.27	(mg/s)		3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.31	(mg/s)		15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)		0.33	(mg/s)		0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.86	(mg/s)		0.86	(mg/s)		0.86	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.14	(mg/s)		0.14	(mg/s)		0.14	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.34	(mg/s)		3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.40	(mg/s)		3.04	(mg/s)		19.42	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.005	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Boron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.027	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.027	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.027	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.198832748	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		9.64	(mg/s)		109	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)		0.52	(mg/s)		0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.25	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		47.02	(mg/s)		537	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)		2.53	(mg/s)		2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.97	(mg/s)		7.41	(mg/s)		7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	13.79	(mg/s)		13.79	(mg/s)		13.79	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	15.61	(mg/s)		15.61	(mg/s)		15.61	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.77	(mg/s)		10.40	(mg/s)		110.16	(mg/s)
	mass flux in river at PM-13	M_r13 =	33.66	(mg/s)		96.75	(mg/s)		686.29	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.023	(mg/L)		0.027	(mg/L)		0.027	(mg/L)
	concentration in river at PM-13	C_r13 =	0.122	(mg/L)		0.040	(mg/L)		0.028	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Barium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	4.81E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	5.71	(mg/s)	65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)	1.66	(mg/s)	1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)	0.15	(mg/s)	0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	27.86	(mg/s)	318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)	8.11	(mg/s)	8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3.34	(mg/s)	3.34	(mg/s)	3.34	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	4.40	(mg/s)	4.40	(mg/s)	4.40	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.81	(mg/s)	7.52	(mg/s)	66.63	(mg/s)
	mass flux in river at PM-13	M_r13 =	17.69	(mg/s)	51.47	(mg/s)	400.83	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.054	(mg/L)	0.019	(mg/L)	0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.064	(mg/L)	0.021	(mg/L)	0.017	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Beryllium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000808254	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.10	(mg/s)		0.31	(mg/s)		2.49	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Calcium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	15	(mg/L)
	concentration of surface water into PM-13	C_s13 =	15	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	15	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	59.94387899	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5,352.95	(mg/s)		60,771	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)		462.42	(mg/s)		462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	140.09	(mg/s)		140.09	(mg/s)		140.09	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		26,119.49	(mg/s)		298,224	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)		2,263.72	(mg/s)		2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	701.59	(mg/s)		5,369.83	(mg/s)		5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	4,157.57	(mg/s)		4,157.57	(mg/s)		4,157.57	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	19.51	(mg/s)		19.51	(mg/s)		19.51	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,826.97	(mg/s)		2,826.97	(mg/s)		2.80	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	602.51	(mg/s)		5,955.45	(mg/s)		61,373.93	(mg/s)
	mass flux in river at PM-13	M_r13 =	10,571.86	(mg/s)		46,712.53	(mg/s)		371,411.34	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	17.891	(mg/L)		15.249	(mg/l)		15.024	(mg/l)
	concentration in river at PM-13	C_r13 =	38.183	(mg/L)		19.271	(mg/l)		15.310	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Cadmium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000227872	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.03	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.14	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)		0.04	(mg/s)		0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.07	(mg/s)		0.24	(mg/s)		1.99	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Chloride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.5	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.5	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.5	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.29E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,319.61	(mg/s)		26,334	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)		43.81	(mg/s)		43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	60.70	(mg/s)		60.70	(mg/s)		60.70	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		11,318.44	(mg/s)		129,230	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)		214.46	(mg/s)		214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	43.78	(mg/s)		335.09	(mg/s)		335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	436.24	(mg/s)		436.24	(mg/s)		436.24	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	82.56	(mg/s)		82.56	(mg/s)		82.56	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,018.62	(mg/s)		1,018.62	(mg/s)		1,018.62	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	104.51	(mg/s)		2,424.12	(mg/s)		26,438.79	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,900.17	(mg/s)		15,829.53	(mg/s)		157,756.15	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	3.103	(mg/L)		6.207	(mg/L)		6.472	(mg/L)
	concentration in river at PM-13	C_r13 =	6.863	(mg/L)		6.530	(mg/L)		6.503	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Cobalt**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001356866	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.21	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.04	(mg/s)		12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.25	(mg/s)		2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.34	(mg/s)		1.62	(mg/s)		14.72	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Copper**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.018240705	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.54	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.61	(mg/s)		30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)		0.48	(mg/s)		0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)		0.19	(mg/s)		0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.27	(mg/s)		1.27	(mg/s)		1.27	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.22	(mg/s)		0.22	(mg/s)		0.22	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.11	(mg/s)		0.65	(mg/s)		6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.09	(mg/s)		5.41	(mg/s)		38.16	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)		0.002	(mg/L)		0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.008	(mg/L)		0.002	(mg/L)		0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Fluoride**

Input concentration data				
	concentration of surface water into PM-12	C_s12 =	0.2	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.2	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.2	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.82E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		71.37	(mg/s)		810	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.87	(mg/s)		1.87	(mg/s)		1.87	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		348.26	(mg/s)		3,976	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)		45.87	(mg/s)		45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.92	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.27	(mg/s)		1.27	(mg/s)		1.27	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	73.30	(mg/s)		73.30	(mg/s)		73.30	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	11.24	(mg/s)		82.61	(mg/s)		821.52	(mg/s)
	mass flux in river at PM-13	M_r13 =	132.73	(mg/s)		558.48	(mg/s)		4,925.45	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.334	(mg/L)		0.212	(mg/L)		0.201	(mg/L)
	concentration in river at PM-13	C_r13 =	0.479	(mg/L)		0.230	(mg/L)		0.203	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Iron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.75E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,034.90	(mg/s)		11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)		0.85	(mg/s)		0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	27.08	(mg/s)		27.08	(mg/s)		27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		5,049.77	(mg/s)		57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)		4.17	(mg/s)		4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.28	(mg/s)		2.13	(mg/s)		2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	46.80	(mg/s)		46.80	(mg/s)		46.80	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.02	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	217.25	(mg/s)		217.25	(mg/s)		217.25	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	27.93	(mg/s)		1,062.84	(mg/s)		11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	296.45	(mg/s)		6,382.97	(mg/s)		69,704.07	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.829	(mg/L)		2.721	(mg/L)		2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	1.071	(mg/L)		2.633	(mg/L)		2.873	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Hardness**

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	227	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8610	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		24,980.41	(mg/s)		283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)		2,129.58	(mg/s)		2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	653.73	(mg/s)		653.73	(mg/s)		653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		121,890.93	(mg/s)		1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)		10,425.01	(mg/s)		10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	6,936.49	(mg/s)		53,090.84	(mg/s)		53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	15,770.06	(mg/s)		15,770.06	(mg/s)		15,770.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	403.90	(mg/s)		403.90	(mg/s)		403.90	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	20,646.59	(mg/s)		20,646.59	(mg/s)		20,646.59	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,783.31	(mg/s)		27,763.72	(mg/s)		286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	56,965.36	(mg/s)		249,991.05	(mg/s)		1,778,431.60	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	82.647	(mg/L)		71.091	(mg/L)		70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	205.746	(mg/L)		103.132	(mg/L)		73.311	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Potassium**

Input concentration data				
	concentration of surface water into PM-12	C_s12 =	0.60	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.60	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.60	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	13.37	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		214.12	(mg/s)		2,431	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.08	(mg/s)		0.08	(mg/s)		0.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1,044.78	(mg/s)		11,929	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	5.60	(mg/s)		5.60	(mg/s)		5.60	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	395.86	(mg/s)		3,029.85	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	927.38	(mg/s)		927.38	(mg/s)		927.38	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	367.44	(mg/s)		367.44	(mg/s)		367.44	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.03	(mg/s)		253.14	(mg/s)		2,469.88	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,925.94	(mg/s)		5,818.83	(mg/s)		18,919.75	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.159	(mg/L)		0.648	(mg/L)		0.605	(mg/l)
	concentration in river at PM-13	C_r13 =	6.956	(mg/L)		2.401	(mg/L)		0.780	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Magnesium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	5.90	(mg/L)
	concentration of surface water into PM-13	C_s13 =	5.90	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	5.90	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	18.87	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	2,105.49	(mg/s)	23,903	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)	259.20	(mg/s)	259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	55.10	(mg/s)	55.10	(mg/s)	55.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	10,273.66	(mg/s)	117,301	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)	1,268.87	(mg/s)	1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	1,994.02	(mg/s)	15,261.91	(mg/s)	15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,308.55	(mg/s)	1,308.55	(mg/s)	1,308.55	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	9.99	(mg/s)	9.99	(mg/s)	9.99	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,308.85	(mg/s)	3,308.85	(mg/s)	3,308.85	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	314.30	(mg/s)	2,419.79	(mg/s)	24,217.73	(mg/s)
	mass flux in river at PM-13	M_r13 =	8,204.58	(mg/s)	33,851.63	(mg/s)	162,677.33	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	9.333	(mg/L)	6.196	(mg/l)	5.928	(mg/l)
	concentration in river at PM-13	C_r13 =	29.633	(mg/L)	13.965	(mg/l)	6.706	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Manganese**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.28	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	107.06	(mg/s)	1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)	4.58	(mg/s)	4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	2.80	(mg/s)	2.80	(mg/s)	2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	522.39	(mg/s)	5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)	22.40	(mg/s)	22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	3.57	(mg/s)	27.31	(mg/s)	27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	19.17	(mg/s)	19.17	(mg/s)	19.17	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	55.94	(mg/s)	55.94	(mg/s)	55.94	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	7.38	(mg/s)	114.44	(mg/s)	1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	108.46	(mg/s)	761.65	(mg/s)	7,312.11	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.219	(mg/L)	0.293	(mg/l)	0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.392	(mg/L)	0.314	(mg/l)	0.301	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Closure
Parameter	Sodium

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	12.15	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	56.03	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)		583.80	(mg/s)		583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	879.28	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	842.70	(mg/s)		842.70	(mg/s)		842.70	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	11.96	(mg/s)		11.96	(mg/s)		11.96	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,095.40	(mg/s)		2,095.40	(mg/s)		2,095.40	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	175.29	(mg/s)		2,316.47	(mg/s)		24,483.86	(mg/s)
	mass flux in river at PM-13	M_r13 =	4,588.43	(mg/s)		23,028.01	(mg/s)		154,037.20	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	5.205	(mg/L)		5.931	(mg/l)		5.993	(mg/l)
	concentration in river at PM-13	C_r13 =	16.572	(mg/L)		9.500	(mg/l)		6.350	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.015125217	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.43	(mg/s)		5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.09	(mg/s)		24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)		0.83	(mg/s)		0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.04	(mg/s)		0.29	(mg/s)		0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.05	(mg/s)		1.05	(mg/s)		1.05	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.33	(mg/s)		0.33	(mg/s)		0.33	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.18	(mg/s)		0.61	(mg/s)		5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.43	(mg/s)		5.21	(mg/s)		31.41	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.005	(mg/L)		0.002	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.009	(mg/L)		0.002	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Lead**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001097329	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.05	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.26	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)	0.14	(mg/s)	0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.02	(mg/s)	0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.08	(mg/s)	0.08	(mg/s)	0.08	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)	0.06	(mg/s)	0.06	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.08	(mg/s)	0.64	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.31	(mg/s)	0.64	(mg/s)	3.91	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Antimony**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.37E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.01	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)		0.18	(mg/s)		0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.37	(mg/s)		0.37	(mg/s)		0.37	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)		0.05	(mg/s)		0.20	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.60	(mg/s)		0.70	(mg/s)		1.57	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Selenium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001503093	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.11	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.52	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)		0.35	(mg/s)		0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.10	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.18	(mg/s)		1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.60	(mg/s)		1.30	(mg/s)		7.85	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)		0.001	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	110.25	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,427.45	(mg/s)		16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)		206.87	(mg/s)		206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	37.36	(mg/s)		37.36	(mg/s)		37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,965.20	(mg/s)		79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)		1,012.72	(mg/s)		1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	7,698.43	(mg/s)		58,922.60	(mg/s)		58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	7,646.82	(mg/s)		7,646.82	(mg/s)		7,646.82	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	344.66	(mg/s)		344.66	(mg/s)		344.66	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	7,206.92	(mg/s)		7,206.92	(mg/s)		7,206.92	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	244.23	(mg/s)		1,671.68	(mg/s)		16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	24,153.77	(mg/s)		83,770.59	(mg/s)		171,110.05	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	7.252	(mg/L)		4.280	(mg/l)		4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	87.238	(mg/L)		34.559	(mg/l)		7.054	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000917488	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.08	(mg/s)		0.53	(mg/s)		4.90	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Closure**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.020231354	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.02	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.40	(mg/s)		1.40	(mg/s)		1.40	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.68	(mg/s)		0.68	(mg/s)		0.68	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.43	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	3.90	(mg/s)		37.62	(mg/s)		386.98	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.013	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.014	(mg/L)		0.016	(mg/L)		0.016	(mg/L)

Appendix F.8

Embarrass River

Proposed Action

Post-Closure

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

FLOWS

Case Flows	Post-Closure Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	1.19	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	9.47	(cfs)	PM-13
	flow check	Q_ck_L =	9.47	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.26	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	2.45	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	1.36	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Post-Closure Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	85.34	(cfs)	PM-13
	flow check	Q_ck_M =	85.34	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	2.45	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	1.36	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Post-Closure High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	856.89	(cfs)	PM-13
	flow check	Q_ck_H =	856.89	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	2.45	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	1.36	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Silver**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00097	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.07	(mg/s)		0.31	(mg/s)		2.71	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Post-Closure
Parameter	Aluminum

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.12	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.12	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.12	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.37E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	42.82	(mg/s)	486	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)	0.61	(mg/s)	0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.12	(mg/s)	1.12	(mg/s)	1.12	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	208.96	(mg/s)	2,386	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)	2.98	(mg/s)	2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.10	(mg/s)	0.75	(mg/s)	0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	44.20	(mg/s)	44.20	(mg/s)	44.20	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	60.72	(mg/s)	60.72	(mg/s)	60.72	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.73	(mg/s)	44.55	(mg/s)	487.90	(mg/s)
	mass flux in river at PM-13	M_r13 =	109.74	(mg/s)	362.17	(mg/s)	2,982.35	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.051	(mg/L)	0.114	(mg/L)	0.119	(mg/L)
	concentration in river at PM-13	C_r13 =	0.409	(mg/L)	0.150	(mg/L)	0.123	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Arsenic**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.012359831	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.27	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.31	(mg/s)	15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)	0.33	(mg/s)	0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.86	(mg/s)	0.86	(mg/s)	0.86	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.11	(mg/s)	0.11	(mg/s)	0.11	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.34	(mg/s)	3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.38	(mg/s)	3.02	(mg/s)	19.39	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.0022	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.0051	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Boron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.027	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.027	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.027	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.198832748	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		9.64	(mg/s)		109	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)		0.52	(mg/s)		0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.25	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		47.02	(mg/s)		537	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)		2.53	(mg/s)		2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.97	(mg/s)		7.41	(mg/s)		7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	13.79	(mg/s)		13.79	(mg/s)		13.79	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	12.69	(mg/s)		12.69	(mg/s)		12.69	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.77	(mg/s)		10.40	(mg/s)		110.16	(mg/s)
	mass flux in river at PM-13	M_r13 =	30.75	(mg/s)		93.84	(mg/s)		683.38	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.023	(mg/L)		0.027	(mg/L)		0.027	(mg/L)
	concentration in river at PM-13	C_r13 =	0.115	(mg/L)		0.039	(mg/L)		0.028	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Barium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	4.81E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)		1.66	(mg/s)		1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)		8.11	(mg/s)		8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3.34	(mg/s)		3.34	(mg/s)		3.34	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3.58	(mg/s)		3.58	(mg/s)		3.58	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.81	(mg/s)		7.52	(mg/s)		66.63	(mg/s)
	mass flux in river at PM-13	M_r13 =	16.87	(mg/s)		50.65	(mg/s)		400.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.054	(mg/L)		0.019	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.063	(mg/L)		0.021	(mg/L)		0.016	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Beryllium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000808254	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.09	(mg/s)		0.30	(mg/s)		2.49	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Calcium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	15	(mg/L)
	concentration of surface water into PM-13	C_s13 =	15	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	15	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	59.94387899	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5,352.95	(mg/s)		60,771	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)		462.42	(mg/s)		462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	140.09	(mg/s)		140.09	(mg/s)		140.09	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		26,119.49	(mg/s)		298,224	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)		2,263.72	(mg/s)		2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	701.59	(mg/s)		5,369.83	(mg/s)		5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	4,157.57	(mg/s)		4,157.57	(mg/s)		4,157.57	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	19.51	(mg/s)		19.51	(mg/s)		19.51	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,299.27	(mg/s)		2,299.27	(mg/s)		2.80	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	602.51	(mg/s)		5,955.45	(mg/s)		61,373.93	(mg/s)
	mass flux in river at PM-13	M_r13 =	10,044.16	(mg/s)		46,184.83	(mg/s)		371,411.34	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	17.891	(mg/L)		15.249	(mg/l)		15.024	(mg/l)
	concentration in river at PM-13	C_r13 =	37.472	(mg/L)		19.123	(mg/l)		15.316	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Cadmium**

Input concentration data				
	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000227872	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.03	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.14	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.02	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)		0.04	(mg/s)		0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.07	(mg/s)		0.24	(mg/s)		1.99	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Chloride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.5	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.5	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.5	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.29E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,319.61	(mg/s)		26,334	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)		43.81	(mg/s)		43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	60.70	(mg/s)		60.70	(mg/s)		60.70	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		11,318.44	(mg/s)		129,230	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)		214.46	(mg/s)		214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	43.78	(mg/s)		335.09	(mg/s)		335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	436.24	(mg/s)		436.24	(mg/s)		436.24	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	82.56	(mg/s)		82.56	(mg/s)		82.56	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	828.47	(mg/s)		828.47	(mg/s)		828.47	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	104.51	(mg/s)		2,424.12	(mg/s)		26,438.79	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,710.03	(mg/s)		15,639.39	(mg/s)		157,566.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	3.103	(mg/L)		6.207	(mg/L)		6.472	(mg/L)
	concentration in river at PM-13	C_r13 =	6.380	(mg/L)		6.475	(mg/L)		6.498	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Cobalt**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001356866	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.21	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.04	(mg/s)	12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)	0.13	(mg/s)	0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.09	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)	0.06	(mg/s)	0.06	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.25	(mg/s)	2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.32	(mg/s)	1.61	(mg/s)	14.71	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Copper**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.018240705	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.54	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.61	(mg/s)		30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)		0.48	(mg/s)		0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)		0.19	(mg/s)		0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.27	(mg/s)		1.27	(mg/s)		1.27	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.18	(mg/s)		0.18	(mg/s)		0.18	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.11	(mg/s)		0.65	(mg/s)		6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.05	(mg/s)		5.37	(mg/s)		38.12	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.00331	(mg/L)		0.002	(mg/L)		0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.00766	(mg/L)		0.002	(mg/L)		0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.2	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.2	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.2	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.82E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	71.37	(mg/s)	810	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)	9.37	(mg/s)	9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.87	(mg/s)	1.87	(mg/s)	1.87	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	348.26	(mg/s)	3,976	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)	45.87	(mg/s)	45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.92	(mg/s)	7.04	(mg/s)	7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.27	(mg/s)	1.27	(mg/s)	1.27	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.13	(mg/s)	0.13	(mg/s)	0.13	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	59.62	(mg/s)	59.62	(mg/s)	59.62	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	11.24	(mg/s)	82.61	(mg/s)	821.52	(mg/s)
	mass flux in river at PM-13	M_r13 =	119.04	(mg/s)	544.80	(mg/s)	4,911.77	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.334	(mg/L)	0.212	(mg/L)	0.201	(mg/L)
	concentration in river at PM-13	C_r13 =	0.444	(mg/L)	0.226	(mg/L)	0.203	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Post-Closure
Parameter	Iron

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.75E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,034.90	(mg/s)		11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)		0.85	(mg/s)		0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	27.08	(mg/s)		27.08	(mg/s)		27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		5,049.77	(mg/s)		57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)		4.17	(mg/s)		4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.28	(mg/s)		2.13	(mg/s)		2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	46.80	(mg/s)		46.80	(mg/s)		46.80	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.02	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	176.69	(mg/s)		176.69	(mg/s)		176.69	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	27.93	(mg/s)		1,062.84	(mg/s)		11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	255.89	(mg/s)		6,342.41	(mg/s)		69,663.52	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.829	(mg/L)		2.721	(mg/L)		2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.955	(mg/L)		2.626	(mg/L)		2.873	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Hardness**

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	2.27E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		24,980.41	(mg/s)		283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)		2,129.58	(mg/s)		2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	653.73	(mg/s)		653.73	(mg/s)		653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		121,890.93	(mg/s)		1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)		10,425.01	(mg/s)		10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	6,936.49	(mg/s)		53,090.84	(mg/s)		53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	15,770.06	(mg/s)		15,770.06	(mg/s)		15,770.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	403.90	(mg/s)		403.90	(mg/s)		403.90	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	16,792.56	(mg/s)		16,792.56	(mg/s)		16,792.56	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,783.31	(mg/s)		27,763.72	(mg/s)		286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	53,111.33	(mg/s)		246,137.02	(mg/s)		1,774,577.57	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	82.647	(mg/L)		71.091	(mg/L)		70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	198.144	(mg/L)		101.913	(mg/L)		73.178	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Potassium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.60	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.60	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.60	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	13.37	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		214.12	(mg/s)		2,431	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.08	(mg/s)		0.08	(mg/s)		0.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1,044.78	(mg/s)		11,929	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	5.60	(mg/s)		5.60	(mg/s)		5.60	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	395.86	(mg/s)		3,029.85	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	927.38	(mg/s)		927.38	(mg/s)		927.38	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	298.85	(mg/s)		298.85	(mg/s)		298.85	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.03	(mg/s)		253.14	(mg/s)		2,469.88	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,857.35	(mg/s)		5,750.24	(mg/s)		18,851.16	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.159	(mg/L)		0.648	(mg/L)		0.605	(mg/l)
	concentration in river at PM-13	C_r13 =	6.929	(mg/L)		2.381	(mg/L)		0.777	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Magnesium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	5.90	(mg/L)
	concentration of surface water into PM-13	C_s13 =	5.90	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	5.90	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	18.87	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	2,105.49	(mg/s)	23,903	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)	259.20	(mg/s)	259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	55.10	(mg/s)	55.10	(mg/s)	55.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	10,273.66	(mg/s)	117,301	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)	1,268.87	(mg/s)	1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	1,994.02	(mg/s)	15,261.91	(mg/s)	15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,308.55	(mg/s)	1,308.55	(mg/s)	1,308.55	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	9.99	(mg/s)	9.99	(mg/s)	9.99	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,691.19	(mg/s)	2,691.19	(mg/s)	2,691.19	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	314.30	(mg/s)	2,419.79	(mg/s)	24,217.73	(mg/s)
	mass flux in river at PM-13	M_r13 =	7,586.93	(mg/s)	33,233.97	(mg/s)	162,059.68	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	9.333	(mg/L)	6.196	(mg/l)	5.928	(mg/l)
	concentration in river at PM-13	C_r13 =	28.305	(mg/L)	13.761	(mg/l)	6.683	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Manganese**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.28	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	2.80	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)		22.40	(mg/s)		22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	3.57	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	19.17	(mg/s)		19.17	(mg/s)		19.17	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	45.50	(mg/s)		45.50	(mg/s)		45.50	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	7.38	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	98.02	(mg/s)		751.21	(mg/s)		7,301.67	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.219	(mg/L)		0.293	(mg/l)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.366	(mg/L)		0.311	(mg/l)		0.301	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Sodium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	12.15	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	56.03	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)		583.80	(mg/s)		583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	879.28	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	842.70	(mg/s)		842.70	(mg/s)		842.70	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	11.96	(mg/s)		11.96	(mg/s)		11.96	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,704.26	(mg/s)		1,704.26	(mg/s)		1,704.26	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	175.29	(mg/s)		2,316.47	(mg/s)		24,483.86	(mg/s)
	mass flux in river at PM-13	M_r13 =	4,197.29	(mg/s)		22,636.87	(mg/s)		153,646.06	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	5.205	(mg/L)		5.931	(mg/l)		5.993	(mg/l)
	concentration in river at PM-13	C_r13 =	15.659	(mg/L)		9.373	(mg/l)		6.336	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.015125217	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.43	(mg/s)		5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.09	(mg/s)		24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)		0.83	(mg/s)		0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.04	(mg/s)		0.29	(mg/s)		0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.05	(mg/s)		1.05	(mg/s)		1.05	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.26	(mg/s)		0.26	(mg/s)		0.26	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.18	(mg/s)		0.61	(mg/s)		5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.37	(mg/s)		5.14	(mg/s)		31.35	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.005	(mg/L)		0.002	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.009	(mg/L)		0.002	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	Post-Closure
Parameter	Lead

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001097329	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.05	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.26	(mg/s)		3	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)		0.14	(mg/s)		0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.08	(mg/s)		0.08	(mg/s)		0.08	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.08	(mg/s)		0.64	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.30	(mg/s)		0.63	(mg/s)		3.90	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Antimony**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.37E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.01	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.07	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)	0.18	(mg/s)	0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.37	(mg/s)	0.37	(mg/s)	0.37	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)	0.05	(mg/s)	0.20	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.60	(mg/s)	0.70	(mg/s)	1.57	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Selenium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001503093	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.11	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.52	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)		0.35	(mg/s)		0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.10	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.18	(mg/s)		1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.59	(mg/s)		1.29	(mg/s)		7.84	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)		0.001	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	110.25	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	1,427.45	(mg/s)	16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)	206.87	(mg/s)	206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	37.36	(mg/s)	37.36	(mg/s)	37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	6,965.20	(mg/s)	79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)	1,012.72	(mg/s)	1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	7,698.43	(mg/s)	58,922.60	(mg/s)	58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	7,646.82	(mg/s)	7,646.82	(mg/s)	7,646.82	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	344.66	(mg/s)	344.66	(mg/s)	344.66	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	5,861.63	(mg/s)	5,861.63	(mg/s)	5,861.63	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	244.23	(mg/s)	1,671.68	(mg/s)	16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	22,808.48	(mg/s)	82,425.30	(mg/s)	169,764.76	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	7.252	(mg/L)	4.280	(mg/l)	4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	85.092	(mg/L)	34.128	(mg/l)	7.001	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000917488	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.08	(mg/s)		0.53	(mg/s)		4.89	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Proposed Action

Case	**Post-Closure**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.020231354	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.02	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.40	(mg/s)		1.40	(mg/s)		1.40	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.55	(mg/s)		0.55	(mg/s)		0.55	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.43	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	3.78	(mg/s)		37.49	(mg/s)		386.85	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.013	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.014	(mg/L)		0.016	(mg/L)		0.016	(mg/L)

Appendix F.9

Embarrass River

Geotechnical Mitigation

Year 1

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

FLOWS

Case Flows	Year 1 Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	1.19	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	11.22	(cfs)	PM-13
	flow check	Q_ck_L =	11.22	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.26	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	3.56	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.0010	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Year 1 Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	87.09	(cfs)	PM-13
	flow check	Q_ck_M =	87.09	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	3.56	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.0010	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Year 1 High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	858.64	(cfs)	PM-13
	flow check	Q_ck_H =	858.64	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	3.56	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.0010	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Silver**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00086	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.10	(mg/s)		0.33	(mg/s)		2.74	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.00004	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.00030	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Aluminum**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.12	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.12	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.12	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.18	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	42.82	(mg/s)	486	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)	0.61	(mg/s)	0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.12	(mg/s)	1.12	(mg/s)	1.12	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	208.96	(mg/s)	2,386	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)	2.98	(mg/s)	2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.10	(mg/s)	0.75	(mg/s)	0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.01	(mg/s)	1.01	(mg/s)	1.01	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	89.10	(mg/s)	89.10	(mg/s)	89.10	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.73	(mg/s)	44.55	(mg/s)	487.90	(mg/s)
	mass flux in river at PM-13	M_r13 =	94.91	(mg/s)	347.34	(mg/s)	2,967.53	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.051	(mg/L)	0.114	(mg/L)	0.119	(mg/L)
	concentration in river at PM-13	C_r13 =	0.299	(mg/L)	0.141	(mg/L)	0.122	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Arsenic**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.006769615	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.27	(mg/s)		3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.31	(mg/s)		15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)		0.33	(mg/s)		0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.68	(mg/s)		0.68	(mg/s)		0.68	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.16	(mg/s)		0.16	(mg/s)		0.16	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.34	(mg/s)		3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.26	(mg/s)		2.89	(mg/s)		19.27	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.004	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Boron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.027	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.027	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.027	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.137838474	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		9.64	(mg/s)		109	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)		0.52	(mg/s)		0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.25	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		47.02	(mg/s)		537	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)		2.53	(mg/s)		2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.97	(mg/s)		7.41	(mg/s)		7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	13.91	(mg/s)		13.91	(mg/s)		13.91	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	18.62	(mg/s)		18.62	(mg/s)		18.62	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.77	(mg/s)		10.40	(mg/s)		110.16	(mg/s)
	mass flux in river at PM-13	M_r13 =	36.79	(mg/s)		99.88	(mg/s)		689.42	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.023	(mg/L)		0.027	(mg/L)		0.027	(mg/L)
	concentration in river at PM-13	C_r13 =	0.116	(mg/L)		0.041	(mg/L)		0.028	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Barium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.05E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)		1.66	(mg/s)		1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)		8.11	(mg/s)		8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	5.09	(mg/s)		5.09	(mg/s)		5.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	5.25	(mg/s)		5.25	(mg/s)		5.25	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.81	(mg/s)		7.52	(mg/s)		66.63	(mg/s)
	mass flux in river at PM-13	M_r13 =	20.29	(mg/s)		54.08	(mg/s)		403.43	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.054	(mg/L)		0.019	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.064	(mg/L)		0.022	(mg/L)		0.017	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Beryllium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000376001	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.09	(mg/s)		0.30	(mg/s)		2.48	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Calcium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	15	(mg/L)
	concentration of surface water into PM-13	C_s13 =	15	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	15	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	77.28097689	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	5,352.95	(mg/s)	60,771	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)	462.42	(mg/s)	462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	140.09	(mg/s)	140.09	(mg/s)	140.09	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	26,119.49	(mg/s)	298,224	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)	2,263.72	(mg/s)	2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	701.59	(mg/s)	5,369.83	(mg/s)	5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	7,796.40	(mg/s)	7,796.40	(mg/s)	7,796.40	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	12.28	(mg/s)	12.28	(mg/s)	12.28	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,373.51	(mg/s)	3,373.51	(mg/s)	1.77	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	602.51	(mg/s)	5,955.45	(mg/s)	61,373.93	(mg/s)
	mass flux in river at PM-13	M_r13 =	14,750.01	(mg/s)	50,890.68	(mg/s)	375,041.91	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	17.891	(mg/L)	15.249	(mg/l)	15.024	(mg/l)
	concentration in river at PM-13	C_r13 =	46.453	(mg/L)	20.648	(mg/l)	15.434	(mg/l)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Cadmium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00032784	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.03	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.14	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)		0.04	(mg/s)		0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.09	(mg/s)		0.26	(mg/s)		2.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Chloride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.5	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.5	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.5	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.52E+01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,319.61	(mg/s)		26,334	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)		43.81	(mg/s)		43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	60.70	(mg/s)		60.70	(mg/s)		60.70	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		11,318.44	(mg/s)		129,230	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)		214.46	(mg/s)		214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	43.78	(mg/s)		335.09	(mg/s)		335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,538.17	(mg/s)		1,538.17	(mg/s)		1,538.17	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	51.97	(mg/s)		51.97	(mg/s)		51.97	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,215.55	(mg/s)		1,215.55	(mg/s)		1,215.55	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	104.51	(mg/s)		2,424.12	(mg/s)		26,438.79	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,168.44	(mg/s)		17,097.80	(mg/s)		159,024.42	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	3.103	(mg/L)		6.207	(mg/L)		6.472	(mg/L)
	concentration in river at PM-13	C_r13 =	9.979	(mg/L)		6.937	(mg/L)		6.544	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Cobalt**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001495727	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.21	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.04	(mg/s)		12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.25	(mg/s)		2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.41	(mg/s)		1.69	(mg/s)		14.79	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Copper**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.0068095	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.54	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.61	(mg/s)		30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)		0.48	(mg/s)		0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)		0.19	(mg/s)		0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.69	(mg/s)		0.69	(mg/s)		0.69	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.26	(mg/s)		0.26	(mg/s)		0.26	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.11	(mg/s)		0.65	(mg/s)		6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.56	(mg/s)		4.87	(mg/s)		37.63	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)		0.002	(mg/L)		0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.005	(mg/L)		0.002	(mg/L)		0.002	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.2	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.2	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.2	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	2.90E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	71.37	(mg/s)	810	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)	9.37	(mg/s)	9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.87	(mg/s)	1.87	(mg/s)	1.87	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	348.26	(mg/s)	3,976	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)	45.87	(mg/s)	45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.92	(mg/s)	7.04	(mg/s)	7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	292.90	(mg/s)	292.90	(mg/s)	292.90	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.08	(mg/s)	0.08	(mg/s)	0.08	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	87.47	(mg/s)	87.47	(mg/s)	87.47	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	11.24	(mg/s)	82.61	(mg/s)	821.52	(mg/s)
	mass flux in river at PM-13	M_r13 =	438.48	(mg/s)	864.24	(mg/s)	5,231.21	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.334	(mg/L)	0.212	(mg/L)	0.201	(mg/L)
	concentration in river at PM-13	C_r13 =	1.381	(mg/L)	0.351	(mg/L)	0.215	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Iron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	4.00E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,034.90	(mg/s)		11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)		0.85	(mg/s)		0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	27.08	(mg/s)		27.08	(mg/s)		27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		5,049.77	(mg/s)		57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)		4.17	(mg/s)		4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.28	(mg/s)		2.13	(mg/s)		2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.40	(mg/s)		0.40	(mg/s)		0.40	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	259.25	(mg/s)		259.25	(mg/s)		259.25	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	27.93	(mg/s)		1,062.84	(mg/s)		11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	292.05	(mg/s)		6,378.57	(mg/s)		69,699.67	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.829	(mg/L)		2.721	(mg/L)		2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.920	(mg/L)		2.588	(mg/L)		2.868	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Hardness**

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	3.74E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	24,980.41	(mg/s)	283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)	2,129.58	(mg/s)	2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	653.73	(mg/s)	653.73	(mg/s)	653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	121,890.93	(mg/s)	1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)	10,425.01	(mg/s)	10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	6,936.49	(mg/s)	53,090.84	(mg/s)	53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	37,758.64	(mg/s)	37,758.64	(mg/s)	37,758.64	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	254.25	(mg/s)	254.25	(mg/s)	254.25	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	24,638.27	(mg/s)	24,638.27	(mg/s)	24,638.27	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,783.31	(mg/s)	27,763.72	(mg/s)	286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	82,795.96	(mg/s)	275,821.65	(mg/s)	1,804,262.20	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	82.647	(mg/L)	71.091	(mg/L)	70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	260.755	(mg/L)	111.911	(mg/L)	74.251	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Potassium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.60	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.60	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.60	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	9.31	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		214.12	(mg/s)		2,431	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1,044.78	(mg/s)		11,929	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	5.60	(mg/s)		5.60	(mg/s)		5.60	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	395.86	(mg/s)		3,029.85	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	938.93	(mg/s)		938.93	(mg/s)		938.93	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	438.48	(mg/s)		438.48	(mg/s)		438.48	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	38.99	(mg/s)		253.11	(mg/s)		2,469.85	(mg/s)
	mass flux in river at PM-13	M_r13 =	2,008.49	(mg/s)		5,901.39	(mg/s)		19,002.31	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.158	(mg/L)		0.648	(mg/L)		0.605	(mg/l)
	concentration in river at PM-13	C_r13 =	6.326	(mg/L)		2.394	(mg/L)		0.782	(mg/l)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Magnesium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	5.90	(mg/L)
	concentration of surface water into PM-13	C_s13 =	5.90	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	5.90	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	44.03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,105.49	(mg/s)		23,903	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	55.10	(mg/s)		55.10	(mg/s)		55.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,273.66	(mg/s)		117,301	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)		1,268.87	(mg/s)		1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	1,994.02	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	4,441.73	(mg/s)		4,441.73	(mg/s)		4,441.73	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	6.29	(mg/s)		6.29	(mg/s)		6.29	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,948.56	(mg/s)		3,948.56	(mg/s)		3,948.56	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	314.30	(mg/s)		2,419.79	(mg/s)		24,217.73	(mg/s)
	mass flux in river at PM-13	M_r13 =	11,973.76	(mg/s)		37,620.81	(mg/s)		166,446.51	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	9.333	(mg/L)		6.196	(mg/l)		5.928	(mg/l)
	concentration in river at PM-13	C_r13 =	37.710	(mg/L)		15.264	(mg/l)		6.850	(mg/l)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Manganese**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.24	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	2.80	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)		22.40	(mg/s)		22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	3.57	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	24.25	(mg/s)		24.25	(mg/s)		24.25	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	66.76	(mg/s)		66.76	(mg/s)		66.76	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	7.38	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	124.35	(mg/s)		777.54	(mg/s)		7,328.00	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.219	(mg/L)		0.293	(mg/l)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.392	(mg/L)		0.315	(mg/l)		0.302	(mg/l)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	Year 1
Parameter	Sodium

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	52.95	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	2,141.18	(mg/s)	24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)	119.26	(mg/s)	119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	56.03	(mg/s)	56.03	(mg/s)	56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	10,447.79	(mg/s)	119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)	583.80	(mg/s)	583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	879.28	(mg/s)	6,729.88	(mg/s)	6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	5,341.70	(mg/s)	5,341.70	(mg/s)	5,341.70	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	7.53	(mg/s)	7.53	(mg/s)	7.53	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,500.51	(mg/s)	2,500.51	(mg/s)	2,500.51	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	175.29	(mg/s)	2,316.47	(mg/s)	24,483.86	(mg/s)
	mass flux in river at PM-13	M_r13 =	9,488.11	(mg/s)	27,927.68	(mg/s)	158,936.87	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	5.205	(mg/L)	5.931	(mg/l)	5.993	(mg/l)
	concentration in river at PM-13	C_r13 =	29.882	(mg/L)	11.331	(mg/l)	6.541	(mg/l)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.019144051	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.43	(mg/s)	5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)	0.17	(mg/s)	0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.09	(mg/s)	24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)	0.83	(mg/s)	0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.04	(mg/s)	0.29	(mg/s)	0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.93	(mg/s)	1.93	(mg/s)	1.93	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.39	(mg/s)	0.39	(mg/s)	0.39	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.18	(mg/s)	0.61	(mg/s)	5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	3.38	(mg/s)	6.15	(mg/s)	32.35	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.005	(mg/L)	0.002	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.011	(mg/L)	0.002	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Lead**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000886329	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.05	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.26	(mg/s)		3	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)		0.14	(mg/s)		0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.08	(mg/s)		0.64	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.33	(mg/s)		0.66	(mg/s)		3.94	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Antimony**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	8.05E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.01	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)		0.18	(mg/s)		0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.81	(mg/s)		0.81	(mg/s)		0.81	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)		0.05	(mg/s)		0.20	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.04	(mg/s)		1.14	(mg/s)		2.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Selenium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001106406	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.11	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.52	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)		0.35	(mg/s)		0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.11	(mg/s)		0.11	(mg/s)		0.11	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.18	(mg/s)		1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.61	(mg/s)		1.32	(mg/s)		7.87	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)		0.001	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	190.00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,427.45	(mg/s)		16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)		206.87	(mg/s)		206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	37.36	(mg/s)		37.36	(mg/s)		37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,965.20	(mg/s)		79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)		1,012.72	(mg/s)		1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	7,698.43	(mg/s)		58,922.60	(mg/s)		58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	19,167.71	(mg/s)		19,167.71	(mg/s)		19,167.71	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	216.95	(mg/s)		216.95	(mg/s)		216.95	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	8,600.26	(mg/s)		8,600.26	(mg/s)		8,600.26	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	244.23	(mg/s)		1,671.68	(mg/s)		16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	36,940.30	(mg/s)		96,557.11	(mg/s)		183,896.57	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	7.252	(mg/L)		4.280	(mg/l)		4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	116.339	(mg/L)		39.177	(mg/l)		7.568	(mg/l)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000907911	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.11	(mg/s)		0.56	(mg/s)		4.93	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model -Tailings Basin- Geotechnical Mitigation

Case	**Year 1**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.0182086	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.02	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.84	(mg/s)		1.84	(mg/s)		1.84	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.81	(mg/s)		0.81	(mg/s)		0.81	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.43	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	4.47	(mg/s)		38.19	(mg/s)		387.54	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.013	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.014	(mg/L)		0.015	(mg/L)		0.016	(mg/L)

Appendix F.10

Embarrass River

Geotechnical Mitigation

Year 5

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

FLOWS

Case Flows	Year 5 Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	1.19	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	12.70	(cfs)	PM-13
	flow check	Q_ck_L =	12.70	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.26	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	5.04	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.015	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Year 5 Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	88.57	(cfs)	PM-13
	flow check	Q_ck_M =	88.57	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	5.04	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.015	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Year 5 High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	860.12	(cfs)	PM-13
	flow check	Q_ck_H =	860.12	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	5.04	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.015	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Silver**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00086	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.12	(mg/s)		0.12	(mg/s)		0.12	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.13	(mg/s)		0.37	(mg/s)		2.77	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Aluminum**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.12	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.12	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.12	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.00E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		42.82	(mg/s)		486	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)		0.61	(mg/s)		0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.12	(mg/s)		1.12	(mg/s)		1.12	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		208.96	(mg/s)		2,386	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)		2.98	(mg/s)		2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.10	(mg/s)		0.75	(mg/s)		0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.42	(mg/s)		1.42	(mg/s)		1.42	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.08	(mg/s)		0.08	(mg/s)		0.08	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	89.10	(mg/s)		89.10	(mg/s)		89.10	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.73	(mg/s)		44.55	(mg/s)		487.90	(mg/s)
	mass flux in river at PM-13	M_r13 =	95.40	(mg/s)		347.83	(mg/s)		2,968.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.051	(mg/L)		0.114	(mg/L)		0.119	(mg/L)
	concentration in river at PM-13	C_r13 =	0.265	(mg/L)		0.139	(mg/L)		0.122	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Arsenic**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.006769615	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.27	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.31	(mg/s)	15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)	0.33	(mg/s)	0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.96	(mg/s)	0.96	(mg/s)	0.96	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.16	(mg/s)	0.16	(mg/s)	0.16	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.34	(mg/s)	3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.54	(mg/s)	3.18	(mg/s)	19.55	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.004	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Boron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.027	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.027	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.027	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.137838474	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		9.64	(mg/s)		109	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)		0.52	(mg/s)		0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.25	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		47.02	(mg/s)		537	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)		2.53	(mg/s)		2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.97	(mg/s)		7.41	(mg/s)		7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	19.64	(mg/s)		19.64	(mg/s)		19.64	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	18.62	(mg/s)		18.62	(mg/s)		18.62	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.77	(mg/s)		10.40	(mg/s)		110.16	(mg/s)
	mass flux in river at PM-13	M_r13 =	42.57	(mg/s)		105.66	(mg/s)		695.20	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.023	(mg/L)		0.027	(mg/L)		0.027	(mg/L)
	concentration in river at PM-13	C_r13 =	0.118	(mg/L)		0.042	(mg/L)		0.029	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Barium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.05E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	5.71	(mg/s)	65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)	1.66	(mg/s)	1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)	0.15	(mg/s)	0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	27.86	(mg/s)	318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)	8.11	(mg/s)	8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	7.19	(mg/s)	7.19	(mg/s)	7.19	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	5.25	(mg/s)	5.25	(mg/s)	5.25	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.81	(mg/s)	7.52	(mg/s)	66.63	(mg/s)
	mass flux in river at PM-13	M_r13 =	22.39	(mg/s)	56.18	(mg/s)	405.54	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.054	(mg/L)	0.019	(mg/L)	0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.062	(mg/L)	0.022	(mg/L)	0.017	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Beryllium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000376001	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.10	(mg/s)		0.32	(mg/s)		2.50	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Calcium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	15	(mg/L)
	concentration of surface water into PM-13	C_s13 =	15	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	15	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	77.28097689	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	5,352.95	(mg/s)	60,771	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)	462.42	(mg/s)	462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	140.09	(mg/s)	140.09	(mg/s)	140.09	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	26,119.49	(mg/s)	298,224	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)	2,263.72	(mg/s)	2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	701.59	(mg/s)	5,369.83	(mg/s)	5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	11,012.42	(mg/s)	11,012.42	(mg/s)	11,012.42	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	176.59	(mg/s)	176.59	(mg/s)	176.59	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,373.51	(mg/s)	3,373.51	(mg/s)	25.38	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	602.51	(mg/s)	5,955.45	(mg/s)	61,373.93	(mg/s)
	mass flux in river at PM-13	M_r13 =	18,130.33	(mg/s)	54,271.00	(mg/s)	378,445.83	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	17.891	(mg/L)	15.249	(mg/l)	15.024	(mg/l)
	concentration in river at PM-13	C_r13 =	50.427	(mg/L)	21.651	(mg/l)	15.547	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Cadmium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00032784	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.03	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.14	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)		0.04	(mg/s)		0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.10	(mg/s)		0.27	(mg/s)		2.02	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Chloride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.5	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.5	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.5	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.52E+01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,319.61	(mg/s)		26,334	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)		43.81	(mg/s)		43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	60.70	(mg/s)		60.70	(mg/s)		60.70	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		11,318.44	(mg/s)		129,230	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)		214.46	(mg/s)		214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	43.78	(mg/s)		335.09	(mg/s)		335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2,172.67	(mg/s)		2,172.67	(mg/s)		2,172.67	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	747.10	(mg/s)		747.10	(mg/s)		747.10	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,215.55	(mg/s)		1,215.55	(mg/s)		1,215.55	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	104.51	(mg/s)		2,424.12	(mg/s)		26,438.79	(mg/s)
	mass flux in river at PM-13	M_r13 =	4,498.06	(mg/s)		18,427.42	(mg/s)		160,354.05	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	3.103	(mg/L)		6.207	(mg/L)		6.472	(mg/L)
	concentration in river at PM-13	C_r13 =	12.511	(mg/L)		7.351	(mg/L)		6.588	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Cobalt**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001495727	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.21	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.04	(mg/s)		12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.21	(mg/s)		0.21	(mg/s)		0.21	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.25	(mg/s)		2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.47	(mg/s)		1.76	(mg/s)		14.86	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Copper**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.0068095	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.54	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.61	(mg/s)	30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)	0.48	(mg/s)	0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)	0.19	(mg/s)	0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.97	(mg/s)	0.97	(mg/s)	0.97	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.26	(mg/s)	0.26	(mg/s)	0.26	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.11	(mg/s)	0.65	(mg/s)	6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.84	(mg/s)	5.16	(mg/s)	37.91	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.002	(mg/L)	0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.005	(mg/L)	0.002	(mg/L)	0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.2	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.2	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.2	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	2.90E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	71.37	(mg/s)	810	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)	9.37	(mg/s)	9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.87	(mg/s)	1.87	(mg/s)	1.87	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	348.26	(mg/s)	3,976	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)	45.87	(mg/s)	45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.92	(mg/s)	7.04	(mg/s)	7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	413.72	(mg/s)	413.72	(mg/s)	413.72	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	1.21	(mg/s)	1.21	(mg/s)	1.21	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	87.47	(mg/s)	87.47	(mg/s)	87.47	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	11.24	(mg/s)	82.61	(mg/s)	821.52	(mg/s)
	mass flux in river at PM-13	M_r13 =	560.43	(mg/s)	986.18	(mg/s)	5,353.16	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.334	(mg/L)	0.212	(mg/L)	0.201	(mg/L)
	concentration in river at PM-13	C_r13 =	1.559	(mg/L)	0.393	(mg/L)	0.220	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Iron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	4.00E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,034.90	(mg/s)		11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)		0.85	(mg/s)		0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	27.08	(mg/s)		27.08	(mg/s)		27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		5,049.77	(mg/s)		57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)		4.17	(mg/s)		4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.28	(mg/s)		2.13	(mg/s)		2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.57	(mg/s)		0.57	(mg/s)		0.57	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	259.25	(mg/s)		259.25	(mg/s)		259.25	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	27.93	(mg/s)		1,062.84	(mg/s)		11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	292.37	(mg/s)		6,378.89	(mg/s)		69,700.00	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.829	(mg/L)		2.721	(mg/L)		2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.813	(mg/L)		2.545	(mg/L)		2.863	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Hardness**

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	3.74E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		24,980.41	(mg/s)		283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)		2,129.58	(mg/s)		2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	653.73	(mg/s)		653.73	(mg/s)		653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		121,890.93	(mg/s)		1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)		10,425.01	(mg/s)		10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	6,936.49	(mg/s)		53,090.84	(mg/s)		53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	53,334.08	(mg/s)		53,334.08	(mg/s)		53,334.08	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	3,654.83	(mg/s)		3,654.83	(mg/s)		3,654.83	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	24,638.27	(mg/s)		24,638.27	(mg/s)		24,638.27	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,783.31	(mg/s)		27,763.72	(mg/s)		286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	101,771.99	(mg/s)		294,797.68	(mg/s)		1,823,238.23	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	82.647	(mg/L)		71.091	(mg/L)		70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	283.067	(mg/L)		117.606	(mg/L)		74.902	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 5
Parameter	Potassium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.60	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.60	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.60	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	9.31	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	214.12	(mg/s)	2,431	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)	38.94	(mg/s)	38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.76	(mg/s)	0.76	(mg/s)	0.76	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1,044.78	(mg/s)	11,929	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)	190.63	(mg/s)	190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	5.60	(mg/s)	5.60	(mg/s)	5.60	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	395.86	(mg/s)	3,029.85	(mg/s)	3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,326.24	(mg/s)	1,326.24	(mg/s)	1,326.24	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	438.48	(mg/s)	438.48	(mg/s)	438.48	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.70	(mg/s)	253.82	(mg/s)	2,470.56	(mg/s)
	mass flux in river at PM-13	M_r13 =	2,396.51	(mg/s)	6,289.41	(mg/s)	19,390.33	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.179	(mg/L)	0.650	(mg/L)	0.605	(mg/l)
	concentration in river at PM-13	C_r13 =	6.666	(mg/L)	2.509	(mg/L)	0.797	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Magnesium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	5.90	(mg/L)
	concentration of surface water into PM-13	C_s13 =	5.90	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	5.90	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	44.03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,105.49	(mg/s)		23,903	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	55.10	(mg/s)		55.10	(mg/s)		55.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,273.66	(mg/s)		117,301	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)		1,268.87	(mg/s)		1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	1,994.02	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	6,273.94	(mg/s)		6,273.94	(mg/s)		6,273.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	90.42	(mg/s)		90.42	(mg/s)		90.42	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,948.56	(mg/s)		3,948.56	(mg/s)		3,948.56	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	314.30	(mg/s)		2,419.79	(mg/s)		24,217.73	(mg/s)
	mass flux in river at PM-13	M_r13 =	13,890.10	(mg/s)		39,537.14	(mg/s)		168,362.85	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	9.333	(mg/L)		6.196	(mg/l)		5.928	(mg/l)
	concentration in river at PM-13	C_r13 =	38.634	(mg/L)		15.773	(mg/l)		6.917	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Manganese**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.24	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	2.80	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)		22.40	(mg/s)		22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	3.57	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	34.25	(mg/s)		34.25	(mg/s)		34.25	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	66.76	(mg/s)		66.76	(mg/s)		66.76	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	7.38	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	134.35	(mg/s)		787.55	(mg/s)		7,338.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.219	(mg/L)		0.293	(mg/l)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.374	(mg/L)		0.314	(mg/l)		0.301	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Sodium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	52.95	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	56.03	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)		583.80	(mg/s)		583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	879.28	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	7,545.15	(mg/s)		7,545.15	(mg/s)		7,545.15	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	108.24	(mg/s)		108.24	(mg/s)		108.24	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,500.51	(mg/s)		2,500.51	(mg/s)		2,500.51	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	175.29	(mg/s)		2,316.47	(mg/s)		24,483.86	(mg/s)
	mass flux in river at PM-13	M_r13 =	11,792.27	(mg/s)		30,231.84	(mg/s)		161,241.03	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	5.205	(mg/L)		5.931	(mg/l)		5.993	(mg/l)
	concentration in river at PM-13	C_r13 =	32.799	(mg/L)		12.061	(mg/l)		6.624	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.019144051	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.43	(mg/s)	5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)	0.17	(mg/s)	0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.09	(mg/s)	24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)	0.83	(mg/s)	0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.04	(mg/s)	0.29	(mg/s)	0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2.73	(mg/s)	2.73	(mg/s)	2.73	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.39	(mg/s)	0.39	(mg/s)	0.39	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.18	(mg/s)	0.61	(mg/s)	5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	4.21	(mg/s)	6.98	(mg/s)	33.19	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.005	(mg/L)	0.002	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.012	(mg/L)	0.003	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Lead**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000886329	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.05	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.26	(mg/s)		3	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)		0.14	(mg/s)		0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.08	(mg/s)		0.64	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.37	(mg/s)		0.70	(mg/s)		3.97	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Antimony**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	8.05E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.01	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.07	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)	0.18	(mg/s)	0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.15	(mg/s)	1.15	(mg/s)	1.15	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)	0.05	(mg/s)	0.20	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.38	(mg/s)	1.48	(mg/s)	2.35	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.004	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Selenium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001106406	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.11	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.52	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)		0.35	(mg/s)		0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.16	(mg/s)		0.16	(mg/s)		0.16	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.02	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.18	(mg/s)		1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.68	(mg/s)		1.39	(mg/s)		7.94	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)		0.001	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	190.00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,427.45	(mg/s)		16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)		206.87	(mg/s)		206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	37.36	(mg/s)		37.36	(mg/s)		37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,965.20	(mg/s)		79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)		1,012.72	(mg/s)		1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	7,698.43	(mg/s)		58,922.60	(mg/s)		58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	27,074.39	(mg/s)		27,074.39	(mg/s)		27,074.39	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	3,118.71	(mg/s)		3,118.71	(mg/s)		3,118.71	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	8,600.26	(mg/s)		8,600.26	(mg/s)		8,600.26	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	244.23	(mg/s)		1,671.68	(mg/s)		16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	47,748.73	(mg/s)		107,365.55	(mg/s)		194,705.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	7.252	(mg/L)		4.280	(mg/l)		4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	132.808	(mg/L)		42.832	(mg/l)		7.999	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000907911	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.15	(mg/s)		0.60	(mg/s)		4.96	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 5**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.0182086	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.02	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2.59	(mg/s)		2.59	(mg/s)		2.59	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.81	(mg/s)		0.81	(mg/s)		0.81	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.43	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	5.23	(mg/s)		38.95	(mg/s)		388.31	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.013	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.015	(mg/L)		0.016	(mg/L)		0.016	(mg/L)

Appendix F.11

Embarrass River

Geotechnical Mitigation

Year 10

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

FLOWS

Case Flows	Year 10 Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	1.19	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	13.22	(cfs)	PM-13
	flow check	Q_ck_L =	13.22	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.26	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	5.55	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.017	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Year 10 Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	89.09	(cfs)	PM-13
	flow check	Q_ck_M =	89.09	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	5.55	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.017	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Year 10 High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	860.64	(cfs)	PM-13
	flow check	Q_ck_H =	860.64	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	5.55	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.017	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Silver**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00084	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.14	(mg/s)		0.38	(mg/s)		2.78	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Aluminum**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.12	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.12	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.12	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.25E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		42.82	(mg/s)		486	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)		0.61	(mg/s)		0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.12	(mg/s)		1.12	(mg/s)		1.12	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		208.96	(mg/s)		2,386	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)		2.98	(mg/s)		2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.10	(mg/s)		0.75	(mg/s)		0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	19.65	(mg/s)		19.65	(mg/s)		19.65	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	89.10	(mg/s)		89.10	(mg/s)		89.10	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.73	(mg/s)		44.55	(mg/s)		487.90	(mg/s)
	mass flux in river at PM-13	M_r13 =	113.63	(mg/s)		366.06	(mg/s)		2,986.25	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.051	(mg/L)		0.114	(mg/L)		0.119	(mg/L)
	concentration in river at PM-13	C_r13 =	0.304	(mg/L)		0.145	(mg/L)		0.123	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 10
Parameter	Arsenic

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.009432521	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.27	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.31	(mg/s)	15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)	0.33	(mg/s)	0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.48	(mg/s)	1.48	(mg/s)	1.48	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.16	(mg/s)	0.16	(mg/s)	0.16	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.34	(mg/s)	3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.06	(mg/s)	3.69	(mg/s)	20.07	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.005	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Boron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.027	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.027	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.027	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.149974322	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	9.64	(mg/s)	109	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)	0.52	(mg/s)	0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.25	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	47.02	(mg/s)	537	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)	2.53	(mg/s)	2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.97	(mg/s)	7.41	(mg/s)	7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	23.55	(mg/s)	23.55	(mg/s)	23.55	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)	0.05	(mg/s)	0.05	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	18.62	(mg/s)	18.62	(mg/s)	18.62	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.77	(mg/s)	10.40	(mg/s)	110.16	(mg/s)
	mass flux in river at PM-13	M_r13 =	46.48	(mg/s)	109.57	(mg/s)	699.11	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.023	(mg/L)	0.027	(mg/L)	0.027	(mg/L)
	concentration in river at PM-13	C_r13 =	0.124	(mg/L)	0.043	(mg/L)	0.029	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Barium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	4.92E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	5.71	(mg/s)	65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)	1.66	(mg/s)	1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)	0.15	(mg/s)	0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	27.86	(mg/s)	318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)	8.11	(mg/s)	8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	7.73	(mg/s)	7.73	(mg/s)	7.73	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	5.25	(mg/s)	5.25	(mg/s)	5.25	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.81	(mg/s)	7.52	(mg/s)	66.63	(mg/s)
	mass flux in river at PM-13	M_r13 =	22.93	(mg/s)	56.71	(mg/s)	406.07	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.054	(mg/L)	0.019	(mg/L)	0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.061	(mg/L)	0.022	(mg/L)	0.017	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Beryllium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000587308	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.14	(mg/s)		0.35	(mg/s)		2.54	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 10
Parameter	Calcium

Input concentration data	concentration of surface water into PM-12	C_s12 =	15	(mg/L)
	concentration of surface water into PM-13	C_s13 =	15	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	15	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	107.272439	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	5,352.95	(mg/s)	60,771	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)	462.42	(mg/s)	462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	140.09	(mg/s)	140.09	(mg/s)	140.09	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	26,119.49	(mg/s)	298,224	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)	2,263.72	(mg/s)	2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	701.59	(mg/s)	5,369.83	(mg/s)	5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	16,841.82	(mg/s)	16,841.82	(mg/s)	16,841.82	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	202.28	(mg/s)	202.28	(mg/s)	202.28	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,373.51	(mg/s)	3,373.51	(mg/s)	29.07	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	602.51	(mg/s)	5,955.45	(mg/s)	61,373.93	(mg/s)
	mass flux in river at PM-13	M_r13 =	23,985.42	(mg/s)	60,126.09	(mg/s)	384,304.62	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	17.891	(mg/L)	15.249	(mg/l)	15.024	(mg/l)
	concentration in river at PM-13	C_r13 =	64.116	(mg/L)	23.848	(mg/l)	15.779	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Cadmium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000645923	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.03	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.14	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.10	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)		0.04	(mg/s)		0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.16	(mg/s)		0.33	(mg/s)		2.08	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Chloride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.5	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.5	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.5	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.09E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,319.61	(mg/s)		26,334	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)		43.81	(mg/s)		43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	60.70	(mg/s)		60.70	(mg/s)		60.70	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		11,318.44	(mg/s)		129,230	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)		214.46	(mg/s)		214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	43.78	(mg/s)		335.09	(mg/s)		335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	799.23	(mg/s)		799.23	(mg/s)		799.23	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	855.78	(mg/s)		855.78	(mg/s)		855.78	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,215.55	(mg/s)		1,215.55	(mg/s)		1,215.55	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	104.51	(mg/s)		2,424.12	(mg/s)		26,438.79	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,233.31	(mg/s)		17,162.67	(mg/s)		159,089.29	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	3.103	(mg/L)		6.207	(mg/L)		6.472	(mg/L)
	concentration in river at PM-13	C_r13 =	8.643	(mg/L)		6.807	(mg/L)		6.532	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Cobalt**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001629161	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.21	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.04	(mg/s)		12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.26	(mg/s)		0.26	(mg/s)		0.26	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.25	(mg/s)		2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.51	(mg/s)		1.80	(mg/s)		14.90	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Copper**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.006983188	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.54	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.61	(mg/s)	30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)	0.48	(mg/s)	0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)	0.19	(mg/s)	0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.10	(mg/s)	1.10	(mg/s)	1.10	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.26	(mg/s)	0.26	(mg/s)	0.26	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.11	(mg/s)	0.65	(mg/s)	6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.97	(mg/s)	5.28	(mg/s)	38.04	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.002	(mg/L)	0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.005	(mg/L)	0.002	(mg/L)	0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.2	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.2	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.2	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.07E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		71.37	(mg/s)		810	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.87	(mg/s)		1.87	(mg/s)		1.87	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		348.26	(mg/s)		3,976	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)		45.87	(mg/s)		45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.92	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	79.61	(mg/s)		79.61	(mg/s)		79.61	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	1.39	(mg/s)		1.39	(mg/s)		1.39	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	87.47	(mg/s)		87.47	(mg/s)		87.47	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	11.24	(mg/s)		82.61	(mg/s)		821.52	(mg/s)
	mass flux in river at PM-13	M_r13 =	226.49	(mg/s)		652.24	(mg/s)		5,019.21	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.334	(mg/L)		0.212	(mg/L)		0.201	(mg/L)
	concentration in river at PM-13	C_r13 =	0.605	(mg/L)		0.259	(mg/L)		0.206	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Iron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	3.97E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,034.90	(mg/s)		11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)		0.85	(mg/s)		0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	27.08	(mg/s)		27.08	(mg/s)		27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		5,049.77	(mg/s)		57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)		4.17	(mg/s)		4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.28	(mg/s)		2.13	(mg/s)		2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	6.24	(mg/s)		6.24	(mg/s)		6.24	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.19	(mg/s)		0.19	(mg/s)		0.19	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	259.25	(mg/s)		259.25	(mg/s)		259.25	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	27.93	(mg/s)		1,062.84	(mg/s)		11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	298.06	(mg/s)		6,384.58	(mg/s)		69,705.69	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.829	(mg/L)		2.721	(mg/L)		2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.797	(mg/L)		2.532	(mg/L)		2.862	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Hardness**

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	3.11E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	24,980.41	(mg/s)	283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)	2,129.58	(mg/s)	2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	653.73	(mg/s)	653.73	(mg/s)	653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	121,890.93	(mg/s)	1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)	10,425.01	(mg/s)	10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	6,936.49	(mg/s)	53,090.84	(mg/s)	53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	48,800.08	(mg/s)	48,800.08	(mg/s)	48,800.08	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	4,186.52	(mg/s)	4,186.52	(mg/s)	4,186.52	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	24,638.27	(mg/s)	24,638.27	(mg/s)	24,638.27	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,783.31	(mg/s)	27,763.72	(mg/s)	286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	97,769.68	(mg/s)	290,795.36	(mg/s)	1,819,235.91	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	82.647	(mg/L)	71.091	(mg/L)	70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	261.349	(mg/L)	115.339	(mg/L)	74.693	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 10
Parameter	Potassium

Input concentration data				
	concentration of surface water into PM-12	C_s12 =	0.60	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.60	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.60	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	7.98	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		214.12	(mg/s)		2,431	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.88	(mg/s)		0.88	(mg/s)		0.88	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1,044.78	(mg/s)		11,929	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	5.60	(mg/s)		5.60	(mg/s)		5.60	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	395.86	(mg/s)		3,029.85	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,252.62	(mg/s)		1,252.62	(mg/s)		1,252.62	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	438.48	(mg/s)		438.48	(mg/s)		438.48	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.82	(mg/s)		253.93	(mg/s)		2,470.67	(mg/s)
	mass flux in river at PM-13	M_r13 =	2,323.01	(mg/s)		6,215.90	(mg/s)		19,316.82	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.182	(mg/L)		0.650	(mg/L)		0.605	(mg/l)
	concentration in river at PM-13	C_r13 =	6.210	(mg/L)		2.465	(mg/L)		0.793	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Magnesium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	5.90	(mg/L)
	concentration of surface water into PM-13	C_s13 =	5.90	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	5.90	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	10.43	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	2,105.49	(mg/s)	23,903	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)	259.20	(mg/s)	259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	55.10	(mg/s)	55.10	(mg/s)	55.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	10,273.66	(mg/s)	117,301	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)	1,268.87	(mg/s)	1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	1,994.02	(mg/s)	15,261.91	(mg/s)	15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,638.19	(mg/s)	1,638.19	(mg/s)	1,638.19	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	103.57	(mg/s)	103.57	(mg/s)	103.57	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,948.56	(mg/s)	3,948.56	(mg/s)	3,948.56	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	314.30	(mg/s)	2,419.79	(mg/s)	24,217.73	(mg/s)
	mass flux in river at PM-13	M_r13 =	9,267.50	(mg/s)	34,914.55	(mg/s)	163,740.25	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	9.333	(mg/L)	6.196	(mg/l)	5.928	(mg/l)
	concentration in river at PM-13	C_r13 =	24.773	(mg/L)	13.848	(mg/l)	6.723	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Manganese**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.16	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	107.06	(mg/s)	1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)	4.58	(mg/s)	4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	2.80	(mg/s)	2.80	(mg/s)	2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	522.39	(mg/s)	5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)	22.40	(mg/s)	22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	3.57	(mg/s)	27.31	(mg/s)	27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	24.88	(mg/s)	24.88	(mg/s)	24.88	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	66.76	(mg/s)	66.76	(mg/s)	66.76	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	7.38	(mg/s)	114.44	(mg/s)	1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	124.99	(mg/s)	778.18	(mg/s)	7,328.64	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.219	(mg/L)	0.293	(mg/l)	0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.334	(mg/L)	0.309	(mg/l)	0.301	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Sodium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	31.37	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	56.03	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)		583.80	(mg/s)		583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	879.28	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	4,924.53	(mg/s)		4,924.53	(mg/s)		4,924.53	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	123.99	(mg/s)		123.99	(mg/s)		123.99	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,500.51	(mg/s)		2,500.51	(mg/s)		2,500.51	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	175.29	(mg/s)		2,316.47	(mg/s)		24,483.86	(mg/s)
	mass flux in river at PM-13	M_r13 =	9,187.40	(mg/s)		27,626.97	(mg/s)		158,636.16	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	5.205	(mg/L)		5.931	(mg/l)		5.993	(mg/l)
	concentration in river at PM-13	C_r13 =	24.559	(mg/L)		10.958	(mg/l)		6.513	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.024818317	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.43	(mg/s)		5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.09	(mg/s)		24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)		0.83	(mg/s)		0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.04	(mg/s)		0.29	(mg/s)		0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3.90	(mg/s)		3.90	(mg/s)		3.90	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.39	(mg/s)		0.39	(mg/s)		0.39	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.18	(mg/s)		0.61	(mg/s)		5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	5.39	(mg/s)		8.16	(mg/s)		34.36	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.005	(mg/L)		0.002	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.014	(mg/L)		0.003	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Lead**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.002998768	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.05	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.26	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)	0.14	(mg/s)	0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.02	(mg/s)	0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.47	(mg/s)	0.47	(mg/s)	0.47	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.08	(mg/s)	0.64	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.71	(mg/s)	1.04	(mg/s)	4.32	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Antimony**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.17E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.01	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)		0.18	(mg/s)		0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.84	(mg/s)		1.84	(mg/s)		1.84	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)		0.05	(mg/s)		0.20	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.08	(mg/s)		2.17	(mg/s)		3.04	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.006	(mg/L)		0.001	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Selenium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00156894	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.11	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.52	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)		0.35	(mg/s)		0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.25	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.18	(mg/s)		1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.77	(mg/s)		1.48	(mg/s)		8.03	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)		0.001	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	223.12	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,427.45	(mg/s)		16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)		206.87	(mg/s)		206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	37.36	(mg/s)		37.36	(mg/s)		37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,965.20	(mg/s)		79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)		1,012.72	(mg/s)		1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	7,698.43	(mg/s)		58,922.60	(mg/s)		58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	35,029.37	(mg/s)		35,029.37	(mg/s)		35,029.37	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	3,572.40	(mg/s)		3,572.40	(mg/s)		3,572.40	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	8,600.26	(mg/s)		8,600.26	(mg/s)		8,600.26	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	244.23	(mg/s)		1,671.68	(mg/s)		16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	56,157.40	(mg/s)		115,774.21	(mg/s)		203,113.67	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	7.252	(mg/L)		4.280	(mg/l)		4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	150.115	(mg/L)		45.920	(mg/l)		8.339	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001032064	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.16	(mg/s)		0.16	(mg/s)		0.16	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.18	(mg/s)		0.63	(mg/s)		5.00	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 10**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.063569909	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.02	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	9.98	(mg/s)		9.98	(mg/s)		9.98	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.81	(mg/s)		0.81	(mg/s)		0.81	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.43	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	12.62	(mg/s)		46.33	(mg/s)		395.69	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.013	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.034	(mg/L)		0.018	(mg/L)		0.016	(mg/L)

Appendix F.12

Embarrass River

Geotechnical Mitigation

Year 15

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

FLOWS

Case Flows	Year 15 Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	1.19	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	13.69	(cfs)	PM-13
	flow check	Q_ck_L =	13.69	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.26	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	6.02	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Year 15 Average Flow Conditions (mean annual)					
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12	
	flow in river at PM-13	Q_r13_M =	89.56	(cfs)	PM-13	81.53
	flow check	Q_ck_M =	89.56	(cfs)		
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12	
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13	
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12	
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13	
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	6.02	(cfs)	PM-13	
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.02	(cfs)	PM-13	
	seepage from cell 2W	Q_s2w_M =	1.99	(cfs)	PM-13	
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12	
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13	

Case Flow	Year 15 High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	861.11	(cfs)	PM-13
	flow check	Q_ck_H =	861.11	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	6.02	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.02	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Silver**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00089	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.16	(mg/s)		0.40	(mg/s)		2.80	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Aluminum**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.12	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.12	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.12	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	8.74E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		42.82	(mg/s)		486	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)		0.61	(mg/s)		0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.12	(mg/s)		1.12	(mg/s)		1.12	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		208.96	(mg/s)		2,386	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)		2.98	(mg/s)		2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.10	(mg/s)		0.75	(mg/s)		0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	14.87	(mg/s)		14.87	(mg/s)		14.87	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	89.10	(mg/s)		89.10	(mg/s)		89.10	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.73	(mg/s)		44.55	(mg/s)		487.90	(mg/s)
	mass flux in river at PM-13	M_r13 =	108.86	(mg/s)		361.29	(mg/s)		2,981.47	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.051	(mg/L)		0.114	(mg/L)		0.119	(mg/L)
	concentration in river at PM-13	C_r13 =	0.281	(mg/L)		0.143	(mg/L)		0.122	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Arsenic**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.007825647	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.27	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.31	(mg/s)	15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)	0.33	(mg/s)	0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.33	(mg/s)	1.33	(mg/s)	1.33	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.16	(mg/s)	0.16	(mg/s)	0.16	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.34	(mg/s)	3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.91	(mg/s)	3.55	(mg/s)	19.92	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.005	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Boron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.027	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.027	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.027	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.153530941	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		9.64	(mg/s)		109	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)		0.52	(mg/s)		0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.25	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		47.02	(mg/s)		537	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)		2.53	(mg/s)		2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.97	(mg/s)		7.41	(mg/s)		7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	26.14	(mg/s)		26.14	(mg/s)		26.14	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	18.62	(mg/s)		18.62	(mg/s)		18.62	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.77	(mg/s)		10.40	(mg/s)		110.16	(mg/s)
	mass flux in river at PM-13	M_r13 =	49.08	(mg/s)		112.16	(mg/s)		701.71	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.023	(mg/L)		0.027	(mg/L)		0.027	(mg/L)
	concentration in river at PM-13	C_r13 =	0.127	(mg/L)		0.044	(mg/L)		0.029	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Barium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.00E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	5.71	(mg/s)	65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)	1.66	(mg/s)	1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)	0.15	(mg/s)	0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	27.86	(mg/s)	318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)	8.11	(mg/s)	8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	8.50	(mg/s)	8.50	(mg/s)	8.50	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	5.25	(mg/s)	5.25	(mg/s)	5.25	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.81	(mg/s)	7.52	(mg/s)	66.63	(mg/s)
	mass flux in river at PM-13	M_r13 =	23.71	(mg/s)	57.49	(mg/s)	406.85	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.054	(mg/L)	0.019	(mg/L)	0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.061	(mg/L)	0.023	(mg/L)	0.017	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Beryllium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000487063	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.08	(mg/s)		0.08	(mg/s)		0.08	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.13	(mg/s)		0.34	(mg/s)		2.53	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Calcium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	15	(mg/L)
	concentration of surface water into PM-13	C_s13 =	15	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	15	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	81.6110992	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5,352.95	(mg/s)		60,771	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)		462.42	(mg/s)		462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	140.09	(mg/s)		140.09	(mg/s)		140.09	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		26,119.49	(mg/s)		298,224	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)		2,263.72	(mg/s)		2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	701.59	(mg/s)		5,369.83	(mg/s)		5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	13,893.59	(mg/s)		13,893.59	(mg/s)		13,893.59	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	205.46	(mg/s)		205.46	(mg/s)		205.46	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,373.51	(mg/s)		3,373.51	(mg/s)		29.52	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	602.51	(mg/s)		5,955.45	(mg/s)		61,373.93	(mg/s)
	mass flux in river at PM-13	M_r13 =	21,040.37	(mg/s)		57,181.04	(mg/s)		381,360.03	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	17.891	(mg/L)		15.249	(mg/L)		15.024	(mg/l)
	concentration in river at PM-13	C_r13 =	54.319	(mg/L)		22.561	(mg/L)		15.649	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Cadmium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000567381	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.03	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.14	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.10	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)		0.04	(mg/s)		0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.15	(mg/s)		0.32	(mg/s)		2.07	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Chloride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.5	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.5	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.5	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.66E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,319.61	(mg/s)		26,334	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)		43.81	(mg/s)		43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	60.70	(mg/s)		60.70	(mg/s)		60.70	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		11,318.44	(mg/s)		129,230	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)		214.46	(mg/s)		214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	43.78	(mg/s)		335.09	(mg/s)		335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	963.96	(mg/s)		963.96	(mg/s)		963.96	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	869.24	(mg/s)		869.24	(mg/s)		869.24	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,215.55	(mg/s)		1,215.55	(mg/s)		1,215.55	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	104.51	(mg/s)		2,424.12	(mg/s)		26,438.79	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,411.50	(mg/s)		17,340.86	(mg/s)		159,267.48	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	3.103	(mg/L)		6.207	(mg/L)		6.472	(mg/L)
	concentration in river at PM-13	C_r13 =	8.807	(mg/L)		6.842	(mg/L)		6.536	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Cobalt**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001926627	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.21	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.04	(mg/s)		12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.33	(mg/s)		0.33	(mg/s)		0.33	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.25	(mg/s)		2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.59	(mg/s)		1.87	(mg/s)		14.97	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Copper**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.009053616	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.54	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.61	(mg/s)		30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)		0.48	(mg/s)		0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)		0.19	(mg/s)		0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.54	(mg/s)		1.54	(mg/s)		1.54	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.26	(mg/s)		0.26	(mg/s)		0.26	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.11	(mg/s)		0.65	(mg/s)		6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.41	(mg/s)		5.73	(mg/s)		38.48	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)		0.002	(mg/L)		0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.006	(mg/L)		0.002	(mg/L)		0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.2	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.2	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.2	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.63E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		71.37	(mg/s)		810	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.87	(mg/s)		1.87	(mg/s)		1.87	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		348.26	(mg/s)		3,976	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)		45.87	(mg/s)		45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.92	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	95.87	(mg/s)		95.87	(mg/s)		95.87	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	1.41	(mg/s)		1.41	(mg/s)		1.41	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	87.47	(mg/s)		87.47	(mg/s)		87.47	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	11.24	(mg/s)		82.61	(mg/s)		821.52	(mg/s)
	mass flux in river at PM-13	M_r13 =	242.78	(mg/s)		668.53	(mg/s)		5,035.50	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.334	(mg/L)		0.212	(mg/L)		0.201	(mg/L)
	concentration in river at PM-13	C_r13 =	0.627	(mg/L)		0.264	(mg/L)		0.207	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 15
Parameter	Iron

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	3.86E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	1,034.90	(mg/s)	11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)	0.85	(mg/s)	0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	27.08	(mg/s)	27.08	(mg/s)	27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	5,049.77	(mg/s)	57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)	4.17	(mg/s)	4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.28	(mg/s)	2.13	(mg/s)	2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	6.57	(mg/s)	6.57	(mg/s)	6.57	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.20	(mg/s)	0.20	(mg/s)	0.20	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	259.25	(mg/s)	259.25	(mg/s)	259.25	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	27.93	(mg/s)	1,062.84	(mg/s)	11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	298.40	(mg/s)	6,384.92	(mg/s)	69,706.03	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.829	(mg/L)	2.721	(mg/L)	2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.770	(mg/L)	2.519	(mg/L)	2.860	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Hardness**

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	2.55E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	24,980.41	(mg/s)	283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)	2,129.58	(mg/s)	2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	653.73	(mg/s)	653.73	(mg/s)	653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	121,890.93	(mg/s)	1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)	10,425.01	(mg/s)	10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	6,936.49	(mg/s)	53,090.84	(mg/s)	53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	43,358.02	(mg/s)	43,358.02	(mg/s)	43,358.02	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	4,252.38	(mg/s)	4,252.38	(mg/s)	4,252.38	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	24,638.27	(mg/s)	24,638.27	(mg/s)	24,638.27	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,783.31	(mg/s)	27,763.72	(mg/s)	286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	92,393.48	(mg/s)	285,419.17	(mg/s)	1,813,859.72	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	82.647	(mg/L)	71.091	(mg/L)	70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	238.530	(mg/L)	112.615	(mg/L)	74.432	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Potassium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.60	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.60	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.60	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.68	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		214.12	(mg/s)		2,431	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.89	(mg/s)		5.60	(mg/s)		0.89	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1,044.78	(mg/s)		11,929	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	5.60	(mg/s)		3,029.85	(mg/s)		5.60	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	395.86	(mg/s)		1,137.30	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,137.30	(mg/s)		0.89	(mg/s)		1,137.30	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	438.48	(mg/s)		438.48	(mg/s)		438.48	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.83	(mg/s)		258.66	(mg/s)		2,470.69	(mg/s)
	mass flux in river at PM-13	M_r13 =	2,207.70	(mg/s)		6,100.59	(mg/s)		19,201.51	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.183	(mg/L)		0.662	(mg/L)		0.605	(mg/l)
	concentration in river at PM-13	C_r13 =	5.700	(mg/L)		2.407	(mg/L)		0.788	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Magnesium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	5.90	(mg/L)
	concentration of surface water into PM-13	C_s13 =	5.90	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	5.90	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	12.36	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,105.49	(mg/s)		23,903	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	55.10	(mg/s)		55.10	(mg/s)		55.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,273.66	(mg/s)		117,301	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)		1,268.87	(mg/s)		1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	1,994.02	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2,104.35	(mg/s)		2,104.35	(mg/s)		2,104.35	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	105.20	(mg/s)		105.20	(mg/s)		105.20	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,948.56	(mg/s)		3,948.56	(mg/s)		3,948.56	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	314.30	(mg/s)		2,419.79	(mg/s)		24,217.73	(mg/s)
	mass flux in river at PM-13	M_r13 =	9,735.30	(mg/s)		35,382.34	(mg/s)		164,208.04	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	9.333	(mg/L)		6.196	(mg/L)		5.928	(mg/l)
	concentration in river at PM-13	C_r13 =	25.133	(mg/L)		13.960	(mg/L)		6.738	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Manganese**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.19	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	2.80	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)		22.40	(mg/s)		22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	3.57	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	33.00	(mg/s)		33.00	(mg/s)		33.00	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	66.76	(mg/s)		66.76	(mg/s)		66.76	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	7.38	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	133.10	(mg/s)		786.29	(mg/s)		7,336.75	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.219	(mg/L)		0.293	(mg/L)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.344	(mg/L)		0.310	(mg/L)		0.301	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Sodium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	26.02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	56.03	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)		583.80	(mg/s)		583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	879.28	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	4,430.53	(mg/s)		4,430.53	(mg/s)		4,430.53	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	125.94	(mg/s)		125.94	(mg/s)		125.94	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,500.51	(mg/s)		2,500.51	(mg/s)		2,500.51	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	175.29	(mg/s)		2,316.47	(mg/s)		24,483.86	(mg/s)
	mass flux in river at PM-13	M_r13 =	8,695.35	(mg/s)		27,134.93	(mg/s)		158,144.12	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	5.205	(mg/L)		5.931	(mg/L)		5.993	(mg/l)
	concentration in river at PM-13	C_r13 =	22.449	(mg/L)		10.706	(mg/L)		6.489	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.022174447	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.43	(mg/s)		5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.09	(mg/s)		24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)		0.83	(mg/s)		0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.04	(mg/s)		0.29	(mg/s)		0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3.78	(mg/s)		3.78	(mg/s)		3.78	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.39	(mg/s)		0.39	(mg/s)		0.39	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.18	(mg/s)		0.61	(mg/s)		5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	5.27	(mg/s)		8.04	(mg/s)		34.24	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.005	(mg/L)		0.002	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.014	(mg/L)		0.003	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Lead**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.002700416	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.05	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.26	(mg/s)		3	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)		0.14	(mg/s)		0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.46	(mg/s)		0.46	(mg/s)		0.46	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.08	(mg/s)		0.64	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.70	(mg/s)		1.03	(mg/s)		4.31	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Antimony**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	9.29E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.01	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)		0.18	(mg/s)		0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.58	(mg/s)		1.58	(mg/s)		1.58	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)		0.05	(mg/s)		0.20	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.82	(mg/s)		1.91	(mg/s)		2.78	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.005	(mg/L)		0.001	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Selenium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001534421	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.11	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.52	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)		0.35	(mg/s)		0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.26	(mg/s)		0.26	(mg/s)		0.26	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.18	(mg/s)		1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.79	(mg/s)		1.50	(mg/s)		8.05	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)		0.001	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Year 15
Parameter	Sulfate

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	183.93	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	1,427.45	(mg/s)	16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)	206.87	(mg/s)	206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	37.36	(mg/s)	37.36	(mg/s)	37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	6,965.20	(mg/s)	79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)	1,012.72	(mg/s)	1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	7,698.43	(mg/s)	58,922.60	(mg/s)	58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	31,312.16	(mg/s)	31,312.16	(mg/s)	31,312.16	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	3,628.60	(mg/s)	3,628.60	(mg/s)	3,628.60	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	8,600.26	(mg/s)	8,600.26	(mg/s)	8,600.26	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	244.23	(mg/s)	1,671.68	(mg/s)	16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	52,496.39	(mg/s)	112,113.21	(mg/s)	199,452.67	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	7.252	(mg/L)	4.280	(mg/L)	4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	135.529	(mg/L)	44.235	(mg/L)	8.185	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001032291	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.18	(mg/s)		0.18	(mg/s)		0.18	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.19	(mg/s)		0.64	(mg/s)		5.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 15**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.066565637	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.02	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	11.33	(mg/s)		11.33	(mg/s)		11.33	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.81	(mg/s)		0.81	(mg/s)		0.81	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.43	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	13.97	(mg/s)		47.69	(mg/s)		397.04	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.013	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.036	(mg/L)		0.019	(mg/L)		0.016	(mg/L)

Appendix F.13

Embarrass River

Geotechnical Mitigation

Year 20

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

FLOWS

Case Flows	Year 20 Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	1.19	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	14.13	(cfs)	PM-13
	flow check	Q_ck_L =	14.13	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.26	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	6.46	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.0193	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Year 20 Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	90.00	(cfs)	PM-13
	flow check	Q_ck_M =	90.00	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	6.46	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.0193	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Year 20 High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	861.55	(cfs)	PM-13
	flow check	Q_ck_H =	861.55	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	6.46	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.0193	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	1.99	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Silver**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00095	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.18	(mg/s)		0.42	(mg/s)		2.82	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Aluminum**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.12	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.12	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.12	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.88E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		42.82	(mg/s)		486	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)		0.61	(mg/s)		0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.12	(mg/s)		1.12	(mg/s)		1.12	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		208.96	(mg/s)		2,386	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)		2.98	(mg/s)		2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.10	(mg/s)		0.75	(mg/s)		0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	12.58	(mg/s)		12.58	(mg/s)		12.58	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.10	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	89.10	(mg/s)		89.10	(mg/s)		89.10	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.73	(mg/s)		44.55	(mg/s)		487.90	(mg/s)
	mass flux in river at PM-13	M_r13 =	106.58	(mg/s)		359.01	(mg/s)		2,979.19	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.051	(mg/L)		0.114	(mg/L)		0.119	(mg/L)
	concentration in river at PM-13	C_r13 =	0.266	(mg/L)		0.141	(mg/L)		0.122	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Arsenic**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.007453418	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.27	(mg/s)		3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.31	(mg/s)		15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)		0.33	(mg/s)		0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.36	(mg/s)		1.36	(mg/s)		1.36	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.16	(mg/s)		0.16	(mg/s)		0.16	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.34	(mg/s)		3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.94	(mg/s)		3.58	(mg/s)		19.95	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.005	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Boron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.027	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.027	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.027	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.158659552	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		9.64	(mg/s)		109	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)		0.52	(mg/s)		0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.25	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		47.02	(mg/s)		537	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)		2.53	(mg/s)		2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.97	(mg/s)		7.41	(mg/s)		7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	29.01	(mg/s)		29.01	(mg/s)		29.01	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	18.62	(mg/s)		18.62	(mg/s)		18.62	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.77	(mg/s)		10.40	(mg/s)		110.16	(mg/s)
	mass flux in river at PM-13	M_r13 =	51.96	(mg/s)		115.04	(mg/s)		704.59	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.023	(mg/L)		0.027	(mg/L)		0.027	(mg/L)
	concentration in river at PM-13	C_r13 =	0.130	(mg/L)		0.045	(mg/L)		0.029	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Barium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.40E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)		1.66	(mg/s)		1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)		8.11	(mg/s)		8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	9.87	(mg/s)		9.87	(mg/s)		9.87	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	5.25	(mg/s)		5.25	(mg/s)		5.25	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.81	(mg/s)		7.52	(mg/s)		66.63	(mg/s)
	mass flux in river at PM-13	M_r13 =	25.08	(mg/s)		58.86	(mg/s)		408.22	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.054	(mg/L)		0.019	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.063	(mg/L)		0.023	(mg/L)		0.017	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Beryllium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000472927	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.13	(mg/s)		0.35	(mg/s)		2.53	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Calcium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	15	(mg/L)
	concentration of surface water into PM-13	C_s13 =	15	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	15	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	65.23766506	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5,352.95	(mg/s)		60,771	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)		462.42	(mg/s)		462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	140.09	(mg/s)		140.09	(mg/s)		140.09	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		26,119.49	(mg/s)		298,224	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)		2,263.72	(mg/s)		2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	701.59	(mg/s)		5,369.83	(mg/s)		5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	11,928.83	(mg/s)		11,928.83	(mg/s)		11,928.83	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	227.25	(mg/s)		227.25	(mg/s)		227.25	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,373.51	(mg/s)		3,373.51	(mg/s)		32.66	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	602.51	(mg/s)		5,955.45	(mg/s)		61,373.93	(mg/s)
	mass flux in river at PM-13	M_r13 =	19,097.41	(mg/s)		55,238.08	(mg/s)		379,420.20	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	17.891	(mg/L)		15.249	(mg/l)		15.024	(mg/l)
	concentration in river at PM-13	C_r13 =	47.743	(mg/L)		21.686	(mg/l)		15.561	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Cadmium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000503271	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.03	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.14	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)		0.04	(mg/s)		0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.15	(mg/s)		0.32	(mg/s)		2.07	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Chloride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.5	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.5	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.5	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.85E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,319.61	(mg/s)		26,334	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)		43.81	(mg/s)		43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	60.70	(mg/s)		60.70	(mg/s)		60.70	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		11,318.44	(mg/s)		129,230	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)		214.46	(mg/s)		214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	43.78	(mg/s)		335.09	(mg/s)		335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,070.58	(mg/s)		1,070.58	(mg/s)		1,070.58	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	961.45	(mg/s)		961.45	(mg/s)		961.45	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,215.55	(mg/s)		1,215.55	(mg/s)		1,215.55	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	104.51	(mg/s)		2,424.12	(mg/s)		26,438.79	(mg/s)
	mass flux in river at PM-13	M_r13 =	3,610.33	(mg/s)		17,539.69	(mg/s)		159,466.31	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	3.103	(mg/L)		6.207	(mg/L)		6.472	(mg/L)
	concentration in river at PM-13	C_r13 =	9.026	(mg/L)		6.886	(mg/L)		6.540	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Cobalt**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00218589	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.21	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.04	(mg/s)		12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.40	(mg/s)		0.40	(mg/s)		0.40	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.09	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.25	(mg/s)		2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.66	(mg/s)		1.94	(mg/s)		15.04	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Copper**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.011428793	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.54	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.61	(mg/s)		30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)		0.48	(mg/s)		0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)		0.19	(mg/s)		0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2.09	(mg/s)		2.09	(mg/s)		2.09	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.26	(mg/s)		0.26	(mg/s)		0.26	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.11	(mg/s)		0.65	(mg/s)		6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	2.96	(mg/s)		6.28	(mg/s)		39.03	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)		0.002	(mg/L)		0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.007	(mg/L)		0.002	(mg/L)		0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.2	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.2	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.2	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	5.99E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		71.37	(mg/s)		810	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.87	(mg/s)		1.87	(mg/s)		1.87	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		348.26	(mg/s)		3,976	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)		45.87	(mg/s)		45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.92	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	109.60	(mg/s)		109.60	(mg/s)		109.60	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	1.56	(mg/s)		1.56	(mg/s)		1.56	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	87.47	(mg/s)		87.47	(mg/s)		87.47	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	11.24	(mg/s)		82.61	(mg/s)		821.52	(mg/s)
	mass flux in river at PM-13	M_r13 =	256.65	(mg/s)		682.40	(mg/s)		5,049.38	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.334	(mg/L)		0.212	(mg/L)		0.201	(mg/L)
	concentration in river at PM-13	C_r13 =	0.642	(mg/L)		0.268	(mg/L)		0.207	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Iron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	2.17E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,034.90	(mg/s)		11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)		0.85	(mg/s)		0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	27.08	(mg/s)		27.08	(mg/s)		27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		5,049.77	(mg/s)		57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)		4.17	(mg/s)		4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.28	(mg/s)		2.13	(mg/s)		2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3.97	(mg/s)		3.97	(mg/s)		3.97	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.22	(mg/s)		0.22	(mg/s)		0.22	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	259.25	(mg/s)		259.25	(mg/s)		259.25	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	27.93	(mg/s)		1,062.84	(mg/s)		11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	295.82	(mg/s)		6,382.34	(mg/s)		69,703.45	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.829	(mg/L)		2.721	(mg/L)		2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.740	(mg/L)		2.506	(mg/L)		2.859	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Hardness**

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	2.18E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	24,980.41	(mg/s)	283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)	2,129.58	(mg/s)	2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	653.73	(mg/s)	653.73	(mg/s)	653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	121,890.93	(mg/s)	1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)	10,425.01	(mg/s)	10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	6,936.49	(mg/s)	53,090.84	(mg/s)	53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	39,904.86	(mg/s)	39,904.86	(mg/s)	39,904.86	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	4,703.46	(mg/s)	4,703.46	(mg/s)	4,703.46	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	24,638.27	(mg/s)	24,638.27	(mg/s)	24,638.27	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,783.31	(mg/s)	27,763.72	(mg/s)	286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	89,391.40	(mg/s)	282,417.09	(mg/s)	1,810,857.64	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	82.647	(mg/L)	71.091	(mg/L)	70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	223.474	(mg/L)	110.877	(mg/L)	74.270	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Potassium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.60	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.60	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.60	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.23	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		214.12	(mg/s)		2,431	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.98	(mg/s)		0.98	(mg/s)		0.98	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1,044.78	(mg/s)		11,929	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	5.60	(mg/s)		5.60	(mg/s)		5.60	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	395.86	(mg/s)		3,029.85	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,138.87	(mg/s)		1,138.87	(mg/s)		1,138.87	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	438.48	(mg/s)		438.48	(mg/s)		438.48	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.92	(mg/s)		254.04	(mg/s)		2,470.78	(mg/s)
	mass flux in river at PM-13	M_r13 =	2,209.36	(mg/s)		6,102.25	(mg/s)		19,203.17	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.186	(mg/L)		0.650	(mg/L)		0.605	(mg/l)
	concentration in river at PM-13	C_r13 =	5.523	(mg/L)		2.396	(mg/L)		0.788	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Magnesium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	5.90	(mg/L)
	concentration of surface water into PM-13	C_s13 =	5.90	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	5.90	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	13.44	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,105.49	(mg/s)		23,903	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	55.10	(mg/s)		55.10	(mg/s)		55.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,273.66	(mg/s)		117,301	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)		1,268.87	(mg/s)		1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	1,994.02	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2,457.15	(mg/s)		2,457.15	(mg/s)		2,457.15	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	116.36	(mg/s)		116.36	(mg/s)		116.36	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,948.56	(mg/s)		3,948.56	(mg/s)		3,948.56	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	314.30	(mg/s)		2,419.79	(mg/s)		24,217.73	(mg/s)
	mass flux in river at PM-13	M_r13 =	10,099.26	(mg/s)		35,746.30	(mg/s)		164,572.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	9.333	(mg/L)		6.196	(mg/l)		5.928	(mg/l)
	concentration in river at PM-13	C_r13 =	25.248	(mg/L)		14.034	(mg/l)		6.750	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Manganese**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.23	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	2.80	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)		22.40	(mg/s)		22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	3.57	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	42.20	(mg/s)		42.20	(mg/s)		42.20	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	66.76	(mg/s)		66.76	(mg/s)		66.76	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	7.38	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	142.30	(mg/s)		795.50	(mg/s)		7,345.96	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.219	(mg/L)		0.293	(mg/l)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.356	(mg/L)		0.312	(mg/l)		0.301	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Sodium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	22.22	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	2,141.18	(mg/s)	24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)	119.26	(mg/s)	119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	56.03	(mg/s)	56.03	(mg/s)	56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	10,447.79	(mg/s)	119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)	583.80	(mg/s)	583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	879.28	(mg/s)	6,729.88	(mg/s)	6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	4,062.28	(mg/s)	4,062.28	(mg/s)	4,062.28	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	139.30	(mg/s)	139.30	(mg/s)	139.30	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,500.51	(mg/s)	2,500.51	(mg/s)	2,500.51	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	175.29	(mg/s)	2,316.47	(mg/s)	24,483.86	(mg/s)
	mass flux in river at PM-13	M_r13 =	8,340.46	(mg/s)	26,780.03	(mg/s)	157,789.22	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	5.205	(mg/L)	5.931	(mg/l)	5.993	(mg/l)
	concentration in river at PM-13	C_r13 =	20.851	(mg/L)	10.514	(mg/l)	6.472	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.023571036	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.43	(mg/s)		5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.09	(mg/s)		24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)		0.83	(mg/s)		0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.04	(mg/s)		0.29	(mg/s)		0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	4.31	(mg/s)		4.31	(mg/s)		4.31	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.39	(mg/s)		0.39	(mg/s)		0.39	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.18	(mg/s)		0.61	(mg/s)		5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	5.81	(mg/s)		8.58	(mg/s)		34.78	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.005	(mg/L)		0.002	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.015	(mg/L)		0.003	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Lead**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.002295615	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.05	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.26	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)	0.14	(mg/s)	0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.02	(mg/s)	0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.42	(mg/s)	0.42	(mg/s)	0.42	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.08	(mg/s)	0.64	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.66	(mg/s)	0.99	(mg/s)	4.27	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Antimony**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	8.78E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.01	(mg/s)	0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.07	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)	0.18	(mg/s)	0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.61	(mg/s)	1.61	(mg/s)	1.61	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)	0.05	(mg/s)	0.20	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.84	(mg/s)	1.94	(mg/s)	2.81	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.005	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Selenium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001434159	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.11	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.52	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)	0.35	(mg/s)	0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.26	(mg/s)	0.26	(mg/s)	0.26	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)	0.06	(mg/s)	0.06	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.18	(mg/s)	1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.79	(mg/s)	1.50	(mg/s)	8.05	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.002	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	163.33	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,427.45	(mg/s)		16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)		206.87	(mg/s)		206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	37.36	(mg/s)		37.36	(mg/s)		37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,965.20	(mg/s)		79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)		1,012.72	(mg/s)		1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	7,698.43	(mg/s)		58,922.60	(mg/s)		58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	29,864.60	(mg/s)		29,864.60	(mg/s)		29,864.60	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	4,013.51	(mg/s)		4,013.51	(mg/s)		4,013.51	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	8,600.26	(mg/s)		8,600.26	(mg/s)		8,600.26	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	244.23	(mg/s)		1,671.68	(mg/s)		16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	51,433.74	(mg/s)		111,050.56	(mg/s)		198,390.02	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	7.252	(mg/L)		4.280	(mg/l)		4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	128.582	(mg/L)		43.598	(mg/l)		8.137	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001001115	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.18	(mg/s)		0.18	(mg/s)		0.18	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.20	(mg/s)		0.65	(mg/s)		5.02	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Year 20**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.058688337	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.02	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	10.73	(mg/s)		10.73	(mg/s)		10.73	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.81	(mg/s)		0.81	(mg/s)		0.81	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.43	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	13.37	(mg/s)		47.09	(mg/s)		396.44	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.013	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.033	(mg/L)		0.018	(mg/L)		0.016	(mg/L)

Appendix F.14

Embarrass River

Geotechnical Mitigation

Closure

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

FLOWS

Case Flows	Closure Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	1.19	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	9.06	(cfs)	PM-13
	flow check	Q_ck_L =	9.06	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.26	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	1.73	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.0017	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	1.67	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Closure Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	84.93	(cfs)	PM-13
	flow check	Q_ck_M =	84.93	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	1.73	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.0017	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	1.67	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Closure High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	856.48	(cfs)	PM-13
	flow check	Q_ck_H =	856.48	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	1.73	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	1.67	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Closure**
Parameter	**Silver**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00124	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.07	(mg/s)		0.31	(mg/s)		2.71	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Closure**
Parameter	**Aluminum**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.12	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.12	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.12	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.15E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	42.82	(mg/s)	486	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)	0.61	(mg/s)	0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.12	(mg/s)	1.12	(mg/s)	1.12	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	208.96	(mg/s)	2,386	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)	2.98	(mg/s)	2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.10	(mg/s)	0.75	(mg/s)	0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	30.13	(mg/s)	30.13	(mg/s)	30.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	74.66	(mg/s)	74.66	(mg/s)	74.66	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.73	(mg/s)	44.55	(mg/s)	487.90	(mg/s)
	mass flux in river at PM-13	M_r13 =	109.60	(mg/s)	362.03	(mg/s)	2,982.21	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.051	(mg/L)	0.114	(mg/L)	0.119	(mg/L)
	concentration in river at PM-13	C_r13 =	0.427	(mg/L)	0.151	(mg/L)	0.123	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Closure**
Parameter	**Arsenic**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.027915158	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.27	(mg/s)		3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.31	(mg/s)		15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)		0.33	(mg/s)		0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.14	(mg/s)		0.14	(mg/s)		0.14	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.34	(mg/s)		3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.91	(mg/s)		3.55	(mg/s)		19.93	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.007	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Boron

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.027	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.027	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.027	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.150573845	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	9.64	(mg/s)	109	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)	0.52	(mg/s)	0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.25	(mg/s)	0.25	(mg/s)	0.25	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	47.02	(mg/s)	537	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)	2.53	(mg/s)	2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.97	(mg/s)	7.41	(mg/s)	7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	7.38	(mg/s)	7.38	(mg/s)	7.38	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	15.61	(mg/s)	15.61	(mg/s)	15.61	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.77	(mg/s)	10.40	(mg/s)	110.16	(mg/s)
	mass flux in river at PM-13	M_r13 =	27.25	(mg/s)	90.34	(mg/s)	679.88	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.023	(mg/L)	0.027	(mg/L)	0.027	(mg/L)
	concentration in river at PM-13	C_r13 =	0.106	(mg/L)	0.038	(mg/L)	0.028	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Closure**
Parameter	**Barium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.95E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)		1.66	(mg/s)		1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)		8.11	(mg/s)		8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.95	(mg/s)		0.95	(mg/s)		0.95	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	4.40	(mg/s)		4.40	(mg/s)		4.40	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.81	(mg/s)		7.52	(mg/s)		66.63	(mg/s)
	mass flux in river at PM-13	M_r13 =	15.30	(mg/s)		49.09	(mg/s)		398.45	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.054	(mg/L)		0.019	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.060	(mg/L)		0.020	(mg/L)		0.016	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Closure**
Parameter	**Beryllium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001323498	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.11	(mg/s)		0.32	(mg/s)		2.50	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Closure**
Parameter	**Calcium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	15	(mg/L)
	concentration of surface water into PM-13	C_s13 =	15	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	15	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	68.73996034	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5,352.95	(mg/s)		60,771	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)		462.42	(mg/s)		462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	140.09	(mg/s)		140.09	(mg/s)		140.09	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		26,119.49	(mg/s)		298,224	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)		2,263.72	(mg/s)		2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	701.59	(mg/s)		5,369.83	(mg/s)		5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3,367.90	(mg/s)		3,367.90	(mg/s)		3,367.90	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	19.51	(mg/s)		19.51	(mg/s)		19.51	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,826.97	(mg/s)		2,826.97	(mg/s)		2.80	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	602.51	(mg/s)		5,955.45	(mg/s)		61,373.93	(mg/s)
	mass flux in river at PM-13	M_r13 =	9,782.19	(mg/s)		45,922.86	(mg/s)		370,621.67	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	17.891	(mg/L)		15.249	(mg/l)		15.024	(mg/l)
	concentration in river at PM-13	C_r13 =	38.136	(mg/L)		19.106	(mg/l)		15.291	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Closure**
Parameter	**Cadmium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001182282	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.03	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.14	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)		0.04	(mg/s)		0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.11	(mg/s)		0.28	(mg/s)		2.03	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Closure**
Parameter	**Chloride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.5	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.5	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.5	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	3.97E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,319.61	(mg/s)		26,334	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)		43.81	(mg/s)		43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	60.70	(mg/s)		60.70	(mg/s)		60.70	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		11,318.44	(mg/s)		129,230	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)		214.46	(mg/s)		214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	43.78	(mg/s)		335.09	(mg/s)		335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	194.68	(mg/s)		194.68	(mg/s)		194.68	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	82.56	(mg/s)		82.56	(mg/s)		82.56	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,018.62	(mg/s)		1,018.62	(mg/s)		1,018.62	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	104.51	(mg/s)		2,424.12	(mg/s)		26,438.79	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,658.61	(mg/s)		15,587.96	(mg/s)		157,514.59	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	3.103	(mg/L)		6.207	(mg/L)		6.472	(mg/L)
	concentration in river at PM-13	C_r13 =	6.466	(mg/L)		6.485	(mg/L)		6.499	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Closure**
Parameter	**Cobalt**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.002707554	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.21	(mg/s)	2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.04	(mg/s)	12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)	0.13	(mg/s)	0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.13	(mg/s)	0.13	(mg/s)	0.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.25	(mg/s)	2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.37	(mg/s)	1.66	(mg/s)	14.76	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Closure**
Parameter	**Copper**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.014116893	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.54	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)	0.10	(mg/s)	0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.61	(mg/s)	30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)	0.48	(mg/s)	0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)	0.19	(mg/s)	0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.69	(mg/s)	0.69	(mg/s)	0.69	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.22	(mg/s)	0.22	(mg/s)	0.22	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.11	(mg/s)	0.65	(mg/s)	6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.52	(mg/s)	4.84	(mg/s)	37.59	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)	0.002	(mg/L)	0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.006	(mg/L)	0.002	(mg/L)	0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Closure**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.2	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.2	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.2	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.14E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	71.37	(mg/s)	810	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)	9.37	(mg/s)	9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.87	(mg/s)	1.87	(mg/s)	1.87	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	348.26	(mg/s)	3,976	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)	45.87	(mg/s)	45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.92	(mg/s)	7.04	(mg/s)	7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	55.70	(mg/s)	55.70	(mg/s)	55.70	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.13	(mg/s)	0.13	(mg/s)	0.13	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	73.30	(mg/s)	73.30	(mg/s)	73.30	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	11.24	(mg/s)	82.61	(mg/s)	821.52	(mg/s)
	mass flux in river at PM-13	M_r13 =	187.16	(mg/s)	612.92	(mg/s)	4,979.89	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.334	(mg/L)	0.212	(mg/L)	0.201	(mg/L)
	concentration in river at PM-13	C_r13 =	0.730	(mg/L)	0.255	(mg/L)	0.205	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Closure**
Parameter	**Iron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	9.94E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,034.90	(mg/s)		11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)		0.85	(mg/s)		0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	27.08	(mg/s)		27.08	(mg/s)		27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		5,049.77	(mg/s)		57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)		4.17	(mg/s)		4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.28	(mg/s)		2.13	(mg/s)		2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	4.87	(mg/s)		4.87	(mg/s)		4.87	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.02	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	217.25	(mg/s)		217.25	(mg/s)		217.25	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	27.93	(mg/s)		1,062.84	(mg/s)		11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	254.52	(mg/s)		6,341.04	(mg/s)		69,662.15	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.829	(mg/L)		2.721	(mg/L)		2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.992	(mg/L)		2.638	(mg/L)		2.874	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Closure**
Parameter	**Hardness**

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	402	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8610	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	24,980.41	(mg/s)	283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)	2,129.58	(mg/s)	2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	653.73	(mg/s)	653.73	(mg/s)	653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	121,890.93	(mg/s)	1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)	10,425.01	(mg/s)	10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	6,936.49	(mg/s)	53,090.84	(mg/s)	53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	19,699.16	(mg/s)	19,699.16	(mg/s)	19,699.16	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	403.90	(mg/s)	403.90	(mg/s)	403.90	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	20,646.59	(mg/s)	20,646.59	(mg/s)	20,646.59	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,783.31	(mg/s)	27,763.72	(mg/s)	286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	60,894.46	(mg/s)	253,920.15	(mg/s)	1,782,360.70	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	82.647	(mg/L)	71.091	(mg/L)	70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	237.397	(mg/L)	105.640	(mg/L)	73.534	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Closure**
Parameter	**Potassium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.60	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.60	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.60	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	21.31	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		214.12	(mg/s)		2,431	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)		38.94	(mg/s)		38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.08	(mg/s)		0.08	(mg/s)		0.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1,044.78	(mg/s)		11,929	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)		190.63	(mg/s)		190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	5.60	(mg/s)		5.60	(mg/s)		5.60	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	395.86	(mg/s)		3,029.85	(mg/s)		3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,043.93	(mg/s)		1,043.93	(mg/s)		1,043.93	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	367.44	(mg/s)		367.44	(mg/s)		367.44	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.03	(mg/s)		253.14	(mg/s)		2,469.88	(mg/s)
	mass flux in river at PM-13	M_r13 =	2,042.48	(mg/s)		5,935.37	(mg/s)		19,036.29	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.159	(mg/L)		0.648	(mg/L)		0.605	(mg/l)
	concentration in river at PM-13	C_r13 =	7.963	(mg/L)		2.469	(mg/L)		0.785	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Closure**
Parameter	**Magnesium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	5.90	(mg/L)
	concentration of surface water into PM-13	C_s13 =	5.90	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	5.90	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	55.96	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,105.49	(mg/s)		23,903	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	55.10	(mg/s)		55.10	(mg/s)		55.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,273.66	(mg/s)		117,301	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)		1,268.87	(mg/s)		1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	1,994.02	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2,741.51	(mg/s)		2,741.51	(mg/s)		2,741.51	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	9.99	(mg/s)		9.99	(mg/s)		9.99	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3,308.85	(mg/s)		3,308.85	(mg/s)		3,308.85	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	314.30	(mg/s)		2,419.79	(mg/s)		24,217.73	(mg/s)
	mass flux in river at PM-13	M_r13 =	9,637.53	(mg/s)		35,284.58	(mg/s)		164,110.28	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	9.333	(mg/L)		6.196	(mg/l)		5.928	(mg/l)
	concentration in river at PM-13	C_r13 =	37.572	(mg/L)		14.680	(mg/l)		6.771	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Closure**
Parameter	**Manganese**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.14	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	2.80	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)		22.40	(mg/s)		22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	3.57	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	7.03	(mg/s)		7.03	(mg/s)		7.03	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	55.94	(mg/s)		55.94	(mg/s)		55.94	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	7.38	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	96.32	(mg/s)		749.51	(mg/s)		7,299.97	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.219	(mg/L)		0.293	(mg/l)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.376	(mg/L)		0.312	(mg/l)		0.301	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Sodium

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	26.63	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	2,141.18	(mg/s)	24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)	119.26	(mg/s)	119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	56.03	(mg/s)	56.03	(mg/s)	56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	10,447.79	(mg/s)	119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)	583.80	(mg/s)	583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	879.28	(mg/s)	6,729.88	(mg/s)	6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,304.55	(mg/s)	1,304.55	(mg/s)	1,304.55	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	11.96	(mg/s)	11.96	(mg/s)	11.96	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,095.40	(mg/s)	2,095.40	(mg/s)	2,095.40	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	175.29	(mg/s)	2,316.47	(mg/s)	24,483.86	(mg/s)
	mass flux in river at PM-13	M_r13 =	5,050.29	(mg/s)	23,489.86	(mg/s)	154,499.05	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	5.205	(mg/L)	5.931	(mg/l)	5.993	(mg/l)
	concentration in river at PM-13	C_r13 =	19.689	(mg/L)	9.773	(mg/l)	6.374	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Closure**
Parameter	**Nickel**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.005498724	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.43	(mg/s)		5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.09	(mg/s)		24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)		0.83	(mg/s)		0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.04	(mg/s)		0.29	(mg/s)		0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.27	(mg/s)		0.27	(mg/s)		0.27	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.33	(mg/s)		0.33	(mg/s)		0.33	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.18	(mg/s)		0.61	(mg/s)		5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.65	(mg/s)		4.43	(mg/s)		30.63	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.005	(mg/L)		0.002	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.006	(mg/L)		0.002	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Closure
Parameter	Lead

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00095888	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.05	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.26	(mg/s)		3	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)		0.14	(mg/s)		0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.02	(mg/s)		0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.08	(mg/s)		0.64	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.28	(mg/s)		0.61	(mg/s)		3.88	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Closure**
Parameter	**Antimony**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.16E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.01	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)		0.18	(mg/s)		0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)		0.05	(mg/s)		0.20	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.29	(mg/s)		0.38	(mg/s)		1.26	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Closure**
Parameter	**Selenium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.003346354	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.11	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)		0.07	(mg/s)		0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.52	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)		0.35	(mg/s)		0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)		0.09	(mg/s)		0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.16	(mg/s)		0.16	(mg/s)		0.16	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.05	(mg/s)		0.05	(mg/s)		0.05	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)		0.18	(mg/s)		1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.66	(mg/s)		1.36	(mg/s)		7.91	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)		0.001	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Closure**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	176.50	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		1,427.45	(mg/s)		16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)		206.87	(mg/s)		206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	37.36	(mg/s)		37.36	(mg/s)		37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		6,965.20	(mg/s)		79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)		1,012.72	(mg/s)		1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	7,698.43	(mg/s)		58,922.60	(mg/s)		58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	8,647.39	(mg/s)		8,647.39	(mg/s)		8,647.39	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	344.66	(mg/s)		344.66	(mg/s)		344.66	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	7,206.92	(mg/s)		7,206.92	(mg/s)		7,206.92	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	244.23	(mg/s)		1,671.68	(mg/s)		16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	25,154.34	(mg/s)		84,771.16	(mg/s)		172,110.62	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	7.252	(mg/L)		4.280	(mg/l)		4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	98.064	(mg/L)		35.268	(mg/l)		7.101	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Closure**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000106288	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.47	(mg/s)		4.84	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Closure**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.012754048	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.02	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.62	(mg/s)		0.62	(mg/s)		0.62	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.68	(mg/s)		0.68	(mg/s)		0.68	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.43	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	3.13	(mg/s)		36.84	(mg/s)		386.20	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.013	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.012	(mg/L)		0.015	(mg/L)		0.016	(mg/L)

Appendix F.15

Embarrass River

Geotechnical Mitigation

Post-Closure

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

FLOWS

Case Flows	Post-Closure Low Flow Conditions (no surface runoff)				Node
Total flow in Embarrass River	flow in river at PM-12	Q_r12_L =	1.19	(cfs)	PM-12
	flow in river at PM-13	Q_r13_L =	8.75	(cfs)	PM-13
	flow check	Q_ck_L =	8.75	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_L =	0.00	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_L =	0.00	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_L =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_L =	0.26	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_L =	1.73	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_L =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_L =	1.36	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_L =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_L =	4.21	(cfs)	PM-13

Case Flow	Post-Closure Average Flow Conditions (mean annual)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_M =	13.80	(cfs)	PM-12
	flow in river at PM-13	Q_r13_M =	84.62	(cfs)	PM-13
	flow check	Q_ck_M =	84.62	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_M =	12.61	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_M =	61.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_M =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_M =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_M =	1.73	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_M =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_M =	1.36	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_M =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_M =	4.21	(cfs)	PM-13

Case Flow	Post-Closure High Flow Conditions (avg. annual 1-day max flow)				
Total flow in Embarrass River	flow in river at PM-12	Q_r12_H =	144.35	(cfs)	PM-12
	flow in river at PM-13	Q_r13_H =	856.17	(cfs)	PM-13
	flow check	Q_ck_H =	856.17	(cfs)	
Input flow data	surface water flow into PM-12	Q_s12_H =	143.16	(cfs)	PM-12
	surface water flow into PM-13	Q_s13_H =	702.53	(cfs)	PM-13
	Babbitt WWTP discharge	Q_sBab_H =	0.33	(cfs)	PM-12
	Area 5 Pit NW discharge	Q_spit_H =	1.99	(cfs)	PM-13
	seepage from Tailings Basin Cells 1E and 2E	Q_fs_H =	1.73	(cfs)	PM-13
	hydrometallurgical residue cells liner leakage	Q_rrs_H =	0.00	(cfs)	PM-13
	seepage from cell 2W	Q_s2w_H =	1.36	(cfs)	PM-13
	ground water flow into PM-12	Q_g12_H =	0.86	(cfs)	PM-12
	ground water flow into PM-13	Q_g13_H =	4.21	(cfs)	PM-13

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Silver**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00011	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00011	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00011	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00015	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00124	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.000125	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000100	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000008	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000008	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.19	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.45	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.07	(mg/s)		0.31	(mg/s)		2.71	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Aluminum**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.12	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.12	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.12	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.01325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	6.15E-01	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.5788	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.025	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.025	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	42.82	(mg/s)	486	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.61	(mg/s)	0.61	(mg/s)	0.61	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.12	(mg/s)	1.12	(mg/s)	1.12	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	208.96	(mg/s)	2,386	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.98	(mg/s)	2.98	(mg/s)	2.98	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.10	(mg/s)	0.75	(mg/s)	0.75	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	30.13	(mg/s)	30.13	(mg/s)	30.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	60.72	(mg/s)	60.72	(mg/s)	60.72	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.73	(mg/s)	44.55	(mg/s)	487.90	(mg/s)
	mass flux in river at PM-13	M_r13 =	95.66	(mg/s)	348.09	(mg/s)	2,968.28	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.051	(mg/L)	0.114	(mg/L)	0.119	(mg/L)
	concentration in river at PM-13	C_r13 =	0.386	(mg/L)	0.145	(mg/L)	0.123	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Arsenic**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00075	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00075	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00075	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.001325	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.027915158	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00291	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00273	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00273	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.27	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1.31	(mg/s)	15	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.33	(mg/s)	0.33	(mg/s)	0.33	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1.37	(mg/s)	1.37	(mg/s)	1.37	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.11	(mg/s)	0.11	(mg/s)	0.11	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.34	(mg/s)	3.11	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.89	(mg/s)	3.53	(mg/s)	19.90	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.001	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.008	(mg/L)	0.001	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Boron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.027	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.027	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.027	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.1315	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.150573845	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.11	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.33	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0212	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0212	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		9.64	(mg/s)		109	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.52	(mg/s)		0.52	(mg/s)		0.52	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.25	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		47.02	(mg/s)		537	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2.53	(mg/s)		2.53	(mg/s)		2.53	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.97	(mg/s)		7.41	(mg/s)		7.41	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	7.38	(mg/s)		7.38	(mg/s)		7.38	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	12.69	(mg/s)		12.69	(mg/s)		12.69	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.77	(mg/s)		10.40	(mg/s)		110.16	(mg/s)
	mass flux in river at PM-13	M_r13 =	24.34	(mg/s)		87.42	(mg/s)		676.97	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.023	(mg/L)		0.027	(mg/L)		0.027	(mg/L)
	concentration in river at PM-13	C_r13 =	0.098	(mg/L)		0.037	(mg/L)		0.028	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Barium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0044	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.95E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	5.00E-03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.09298	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0681	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0681	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	1.66	(mg/s)		1.66	(mg/s)		1.66	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	8.11	(mg/s)		8.11	(mg/s)		8.11	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)		0.25	(mg/s)		0.25	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.95	(mg/s)		0.95	(mg/s)		0.95	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	3.58	(mg/s)		3.58	(mg/s)		3.58	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	1.81	(mg/s)		7.52	(mg/s)		66.63	(mg/s)
	mass flux in river at PM-13	M_r13 =	14.48	(mg/s)		48.27	(mg/s)		397.63	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.054	(mg/L)		0.019	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.058	(mg/L)		0.020	(mg/L)		0.016	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Post-Closure
Parameter	Beryllium

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0001	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0001	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0001	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001323498	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00075	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000023	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000023	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.04	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.17	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	-	(mg/s)		-	(mg/s)		-	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.04	(mg/s)		0.41	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.10	(mg/s)		0.31	(mg/s)		2.50	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Calcium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	15	(mg/L)
	concentration of surface water into PM-13	C_s13 =	15	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	15	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	95.35	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	68.73996034	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	416	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	59.78	(mg/L)
	concentration of ground water into PM-12	C_g12 =	19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	19	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5,352.95	(mg/s)		60,771	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	462.42	(mg/s)		462.42	(mg/s)		462.42	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	140.09	(mg/s)		140.09	(mg/s)		140.09	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		26,119.49	(mg/s)		298,224	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	2,263.72	(mg/s)		2,263.72	(mg/s)		2,263.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	701.59	(mg/s)		5,369.83	(mg/s)		5,369.83	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	3,367.90	(mg/s)		3,367.90	(mg/s)		3,367.90	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	19.51	(mg/s)		19.51	(mg/s)		19.51	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,299.27	(mg/s)		2,299.27	(mg/s)		2.80	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	602.51	(mg/s)		5,955.45	(mg/s)		61,373.93	(mg/s)
	mass flux in river at PM-13	M_r13 =	9,254.49	(mg/s)		45,395.16	(mg/s)		370,621.67	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	17.891	(mg/L)		15.249	(mg/l)		15.024	(mg/l)
	concentration in river at PM-13	C_r13 =	37.364	(mg/L)		18.956	(mg/l)		15.296	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Cadmium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00008	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00008	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00008	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0001	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.001182282	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.000188	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0003	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0003	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.03	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.14	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.01	(mg/s)		0.04	(mg/s)		0.33	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.11	(mg/s)		0.28	(mg/s)		2.03	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Chloride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.5	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.5	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.5	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	5.95	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	3.97E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.76E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	21.54	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.8	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.8	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	2,319.61	(mg/s)	26,334	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	43.81	(mg/s)	43.81	(mg/s)	43.81	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	60.70	(mg/s)	60.70	(mg/s)	60.70	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	11,318.44	(mg/s)	129,230	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	214.46	(mg/s)	214.46	(mg/s)	214.46	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	43.78	(mg/s)	335.09	(mg/s)	335.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	194.68	(mg/s)	194.68	(mg/s)	194.68	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	82.56	(mg/s)	82.56	(mg/s)	82.56	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	828.47	(mg/s)	828.47	(mg/s)	828.47	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	104.51	(mg/s)	2,424.12	(mg/s)	26,438.79	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,468.46	(mg/s)	15,397.82	(mg/s)	157,324.45	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	3.103	(mg/L)	6.207	(mg/L)	6.472	(mg/L)
	concentration in river at PM-13	C_r13 =	5.929	(mg/L)	6.430	(mg/L)	6.493	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Cobalt**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0006	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0006	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0006	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.000555	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.002707554	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.001556	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0011	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0011	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.21	(mg/s)		2	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		1.04	(mg/s)		12	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)		0.25	(mg/s)		2.46	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.36	(mg/s)		1.65	(mg/s)		14.75	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.001	(mg/L)		0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Copper**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.00345	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.014116893	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0015	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.004555	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.004	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.54	(mg/s)		6	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.10	(mg/s)		0.10	(mg/s)		0.10	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		2.61	(mg/s)		30	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.48	(mg/s)		0.48	(mg/s)		0.48	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.03	(mg/s)		0.19	(mg/s)		0.19	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.69	(mg/s)		0.69	(mg/s)		0.69	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.18	(mg/s)		0.18	(mg/s)		0.18	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.11	(mg/s)		0.65	(mg/s)		6.19	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.48	(mg/s)		4.80	(mg/s)		37.55	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.003	(mg/L)		0.002	(mg/L)		0.002	(mg/L)
	concentration in river at PM-13	C_r13 =	0.006	(mg/L)		0.002	(mg/L)		0.002	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Fluoride**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.2	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.2	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.2	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.125	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.14E+00	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	2.85E+00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.55	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.385	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.385	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		71.37	(mg/s)		810	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	9.37	(mg/s)		9.37	(mg/s)		9.37	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	1.87	(mg/s)		1.87	(mg/s)		1.87	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		348.26	(mg/s)		3,976	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	45.87	(mg/s)		45.87	(mg/s)		45.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.92	(mg/s)		7.04	(mg/s)		7.04	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	55.70	(mg/s)		55.70	(mg/s)		55.70	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.13	(mg/s)		0.13	(mg/s)		0.13	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	59.62	(mg/s)		59.62	(mg/s)		59.62	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	11.24	(mg/s)		82.61	(mg/s)		821.52	(mg/s)
	mass flux in river at PM-13	M_r13 =	173.48	(mg/s)		599.23	(mg/s)		4,966.21	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.334	(mg/L)		0.212	(mg/L)		0.201	(mg/L)
	concentration in river at PM-13	C_r13 =	0.700	(mg/L)		0.250	(mg/L)		0.205	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Iron**

Input concentration data	concentration of surface water into PM-12	C_s12 =	2.9	(mg/L)
	concentration of surface water into PM-13	C_s13 =	2.9	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	2.9	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.037761905	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	9.94E-02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	4.00E-01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	4.594	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.035	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.035	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	1,034.90	(mg/s)	11,749	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.85	(mg/s)	0.85	(mg/s)	0.85	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	27.08	(mg/s)	27.08	(mg/s)	27.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	5,049.77	(mg/s)	57,657	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	4.17	(mg/s)	4.17	(mg/s)	4.17	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.28	(mg/s)	2.13	(mg/s)	2.13	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	4.87	(mg/s)	4.87	(mg/s)	4.87	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.02	(mg/s)	0.02	(mg/s)	0.02	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	176.69	(mg/s)	176.69	(mg/s)	176.69	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	27.93	(mg/s)	1,062.84	(mg/s)	11,777.08	(mg/s)
	mass flux in river at PM-13	M_r13 =	213.97	(mg/s)	6,300.48	(mg/s)	69,621.59	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.829	(mg/L)	2.721	(mg/L)	2.883	(mg/L)
	concentration in river at PM-13	C_r13 =	0.864	(mg/L)	2.631	(mg/L)	2.873	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Hardness**

Input concentration data	concentration of surface water into PM-12	C_s12 =	70	(mg/L)
	concentration of surface water into PM-13	C_s13 =	70	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	70	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	942.7142857	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	4.02E+02	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	8.61E+03	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	436.6	(mg/L)
	concentration of ground water into PM-12	C_g12 =	87.5	(mg/L)
	concentration of ground water into PM-13	C_g13 =	87.5	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	24,980.41	(mg/s)	283,600	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	2,129.58	(mg/s)	2,129.58	(mg/s)	2,129.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	653.73	(mg/s)	653.73	(mg/s)	653.73	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	121,890.93	(mg/s)	1,391,712	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	10,425.01	(mg/s)	10,425.01	(mg/s)	10,425.01	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	6,936.49	(mg/s)	53,090.84	(mg/s)	53,090.84	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	19,699.16	(mg/s)	19,699.16	(mg/s)	19,699.16	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	403.90	(mg/s)	403.90	(mg/s)	403.90	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	16,792.56	(mg/s)	16,792.56	(mg/s)	16,792.56	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	2,783.31	(mg/s)	27,763.72	(mg/s)	286,383.27	(mg/s)
	mass flux in river at PM-13	M_r13 =	57,040.43	(mg/s)	250,066.12	(mg/s)	1,778,506.67	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	82.647	(mg/L)	71.091	(mg/L)	70.104	(mg/L)
	concentration in river at PM-13	C_r13 =	230.297	(mg/L)	104.420	(mg/L)	73.402	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Potassium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.60	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.60	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.60	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	53.80	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	21.31	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	1.80	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	7.77	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.60	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.60	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	214.12	(mg/s)	2,431	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	38.94	(mg/s)	38.94	(mg/s)	38.94	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.08	(mg/s)	0.08	(mg/s)	0.08	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	1,044.78	(mg/s)	11,929	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	190.63	(mg/s)	190.63	(mg/s)	190.63	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	5.60	(mg/s)	5.60	(mg/s)	5.60	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	395.86	(mg/s)	3,029.85	(mg/s)	3,029.85	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,043.93	(mg/s)	1,043.93	(mg/s)	1,043.93	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	298.85	(mg/s)	298.85	(mg/s)	298.85	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	39.03	(mg/s)	253.14	(mg/s)	2,469.88	(mg/s)
	mass flux in river at PM-13	M_r13 =	1,973.89	(mg/s)	5,866.78	(mg/s)	18,967.70	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	1.159	(mg/L)	0.648	(mg/L)	0.605	(mg/l)
	concentration in river at PM-13	C_r13 =	7.969	(mg/L)	2.450	(mg/L)	0.783	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Post-Closure
Parameter	Magnesium

Input concentration data	concentration of surface water into PM-12	C_s12 =	5.90	(mg/L)
	concentration of surface water into PM-13	C_s13 =	5.90	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	5.90	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	271.00	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	55.96	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	213.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	69.97	(mg/L)
	concentration of ground water into PM-12	C_g12 =	10.65	(mg/L)
	concentration of ground water into PM-13	C_g13 =	10.65	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,105.49	(mg/s)		23,903	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	259.20	(mg/s)		259.20	(mg/s)		259.20	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	55.10	(mg/s)		55.10	(mg/s)		55.10	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,273.66	(mg/s)		117,301	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,268.87	(mg/s)		1,268.87	(mg/s)		1,268.87	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	1,994.02	(mg/s)		15,261.91	(mg/s)		15,261.91	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	2,741.51	(mg/s)		2,741.51	(mg/s)		2,741.51	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	9.99	(mg/s)		9.99	(mg/s)		9.99	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	2,691.19	(mg/s)		2,691.19	(mg/s)		2,691.19	(mg/s)
			Low Flow			Average Flow			High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	314.30	(mg/s)		2,419.79	(mg/s)		24,217.73	(mg/s)
	mass flux in river at PM-13	M_r13 =	9,019.88	(mg/s)		34,666.93	(mg/s)		163,492.63	(mg/s)
			Low Flow			Average Flow			High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	9.333	(mg/L)		6.196	(mg/l)		5.928	(mg/l)
	concentration in river at PM-13	C_r13 =	36.417	(mg/L)		14.476	(mg/l)		6.748	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Manganese**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.30	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.30	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.30	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.49	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.14	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	1.18	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.19	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.19	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		107.06	(mg/s)		1,215	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	4.58	(mg/s)		4.58	(mg/s)		4.58	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	2.80	(mg/s)		2.80	(mg/s)		2.80	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		522.39	(mg/s)		5,964	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	22.40	(mg/s)		22.40	(mg/s)		22.40	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	3.57	(mg/s)		27.31	(mg/s)		27.31	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	7.03	(mg/s)		7.03	(mg/s)		7.03	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	45.50	(mg/s)		45.50	(mg/s)		45.50	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	7.38	(mg/s)		114.44	(mg/s)		1,222.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	85.88	(mg/s)		739.07	(mg/s)		7,289.53	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.219	(mg/L)		0.293	(mg/l)		0.299	(mg/l)
	concentration in river at PM-13	C_r13 =	0.347	(mg/L)		0.309	(mg/l)		0.301	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Sodium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	6.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	6.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	6.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	119.50	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	26.63	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	255.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	44.31	(mg/L)
	concentration of ground water into PM-12	C_g12 =	4.90	(mg/L)
	concentration of ground water into PM-13	C_g13 =	4.90	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		2,141.18	(mg/s)		24,309	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	119.26	(mg/s)		119.26	(mg/s)		119.26	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	56.03	(mg/s)		56.03	(mg/s)		56.03	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		10,447.79	(mg/s)		119,290	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	583.80	(mg/s)		583.80	(mg/s)		583.80	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	879.28	(mg/s)		6,729.88	(mg/s)		6,729.88	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	1,304.55	(mg/s)		1,304.55	(mg/s)		1,304.55	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	11.96	(mg/s)		11.96	(mg/s)		11.96	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	1,704.26	(mg/s)		1,704.26	(mg/s)		1,704.26	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	175.29	(mg/s)		2,316.47	(mg/s)		24,483.86	(mg/s)
	mass flux in river at PM-13	M_r13 =	4,659.15	(mg/s)		23,098.72	(mg/s)		154,107.91	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	5.205	(mg/L)		5.931	(mg/l)		5.993	(mg/l)
	concentration in river at PM-13	C_r13 =	18.811	(mg/L)		9.645	(mg/l)		6.360	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Post-Closure
Parameter	Nickel

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0012	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0012	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0012	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0052	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.005498724	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.098	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00688	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.007	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.007	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.43	(mg/s)	5	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.17	(mg/s)	0.17	(mg/s)	0.17	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.01	(mg/s)	0.01	(mg/s)	0.01	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	2.09	(mg/s)	24	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.83	(mg/s)	0.83	(mg/s)	0.83	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.04	(mg/s)	0.29	(mg/s)	0.29	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.27	(mg/s)	0.27	(mg/s)	0.27	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.26	(mg/s)	0.26	(mg/s)	0.26	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.18	(mg/s)	0.61	(mg/s)	5.04	(mg/s)
	mass flux in river at PM-13	M_r13 =	1.59	(mg/s)	4.36	(mg/s)	30.57	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.005	(mg/L)	0.002	(mg/L)	0.001	(mg/L)
	concentration in river at PM-13	C_r13 =	0.006	(mg/L)	0.002	(mg/L)	0.001	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	Post-Closure
Parameter	Lead

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.00015	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.00015	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.00015	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.00095888	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0005	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0012	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0012	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0012	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.05	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.03	(mg/s)	0.03	(mg/s)	0.03	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.26	(mg/s)	3	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.14	(mg/s)	0.14	(mg/s)	0.14	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)	0.02	(mg/s)	0.02	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.05	(mg/s)	0.05	(mg/s)	0.05	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.05	(mg/s)	0.05	(mg/s)	0.05	(mg/s)
			Low Flow		Average Flow		High Flow	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.03	(mg/s)	0.08	(mg/s)	0.64	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.27	(mg/s)	0.60	(mg/s)	3.87	(mg/s)
			Low Flow		Average Flow		High Flow	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)	0.000	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Antimony**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00E-05	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00E-05	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00E-05	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	2.50E-04	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	1.16E-03	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.004	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	2.50E-04	(mg/L)
	concentration of ground water into PM-12	C_g12 =	1.50E-03	(mg/L)
	concentration of ground water into PM-13	C_g13 =	1.50E-03	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.01	(mg/s)		0	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.04	(mg/s)		0.04	(mg/s)		0.04	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.18	(mg/s)		0.18	(mg/s)		0.18	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.06	(mg/s)		0.06	(mg/s)		0.06	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.04	(mg/s)		0.05	(mg/s)		0.20	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.28	(mg/s)		0.38	(mg/s)		1.25	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.001	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Selenium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0003	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0003	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0003	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0016	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.003346354	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.054	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.00109	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.00295	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.00295	(mg/L)

			Low Flow		Average Flow		High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	0.11	(mg/s)	1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.07	(mg/s)	0.07	(mg/s)	0.07	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	0.52	(mg/s)	6	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.35	(mg/s)	0.35	(mg/s)	0.35	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.01	(mg/s)	0.09	(mg/s)	0.09	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.16	(mg/s)	0.16	(mg/s)	0.16	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)	0.00	(mg/s)	0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.04	(mg/s)	0.04	(mg/s)	0.04	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.07	(mg/s)	0.18	(mg/s)	1.29	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.65	(mg/s)	1.35	(mg/s)	7.90	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.002	(mg/L)	0.000	(mg/L)	0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.003	(mg/L)	0.001	(mg/L)	0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Sulfate**

Input concentration data	concentration of surface water into PM-12	C_s12 =	4.00	(mg/L)
	concentration of surface water into PM-13	C_s13 =	4.00	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	4.00	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	1046.27	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	176.50	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	7347.00	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	152.40	(mg/L)
	concentration of ground water into PM-12	C_g12 =	8.50	(mg/L)
	concentration of ground water into PM-13	C_g13 =	8.50	(mg/L)

			Low Flow		**Average Flow**		**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)	1,427.45	(mg/s)	16,206	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	206.87	(mg/s)	206.87	(mg/s)	206.87	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	37.36	(mg/s)	37.36	(mg/s)	37.36	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)	6,965.20	(mg/s)	79,526	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1,012.72	(mg/s)	1,012.72	(mg/s)	1,012.72	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	7,698.43	(mg/s)	58,922.60	(mg/s)	58,922.60	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	8,647.39	(mg/s)	8,647.39	(mg/s)	8,647.39	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	344.66	(mg/s)	344.66	(mg/s)	344.66	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	5,861.63	(mg/s)	5,861.63	(mg/s)	5,861.63	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	244.23	(mg/s)	1,671.68	(mg/s)	16,449.94	(mg/s)
	mass flux in river at PM-13	M_r13 =	23,809.05	(mg/s)	83,425.87	(mg/s)	170,765.33	(mg/s)
			Low Flow		**Average Flow**		**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	7.252	(mg/L)	4.280	(mg/l)	4.027	(mg/l)
	concentration in river at PM-13	C_r13 =	96.128	(mg/L)	34.836	(mg/l)	7.048	(mg/l)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Thallium**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.0002	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.0002	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.0002	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.0006	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.000106288	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.0002	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.0002	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.000004	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.000004	(mg/L)

			Low Flow			Average Flow			High Flow	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		0.07	(mg/s)		1	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		0.35	(mg/s)		4	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.00	(mg/s)		0.03	(mg/s)		0.03	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.01	(mg/s)		0.01	(mg/s)		0.01	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.00	(mg/s)		0.07	(mg/s)		0.81	(mg/s)
	mass flux in river at PM-13	M_r13 =	0.02	(mg/s)		0.47	(mg/s)		4.84	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)
	concentration in river at PM-13	C_r13 =	0.000	(mg/L)		0.000	(mg/L)		0.000	(mg/L)

Embarrass River Mass-Balance Model-Tailings Basin-Geotechnical Mitigation

Case	**Post-Closure**
Parameter	**Zinc**

Input concentration data	concentration of surface water into PM-12	C_s12 =	0.016	(mg/L)
	concentration of surface water into PM-13	C_s13 =	0.016	(mg/L)
	concentration in Babbitt WWTP discharge	C_sBab =	0.016	(mg/L)
	concentration in Area 5 Pit NW discharge	C_spit =	0.003	(mg/L)
	concentration in seepage from Tailings Basin Cells 1E and 2E	C_fs =	0.012754048	(mg/L)
	concentration in hydrometallurgical residue cells liner leakage	C_rrs =	0.01	(mg/L)
	concentration in tailings basin cell 2W	C_s2w =	0.01435	(mg/L)
	concentration of ground water into PM-12	C_g12 =	0.0115	(mg/L)
	concentration of ground water into PM-13	C_g13 =	0.0115	(mg/L)

			Low Flow			**Average Flow**			**High Flow**	
Convert concentration to mass flux	mass flux of surface water into PM-12	M_s12 =	-	(mg/s)		5.71	(mg/s)		65	(mg/s)
	mass flux of ground water into PM-12	M_g12 =	0.28	(mg/s)		0.28	(mg/s)		0.28	(mg/s)
	mass flux in Babbitt WWTP discharge	M_sBab =	0.15	(mg/s)		0.15	(mg/s)		0.15	(mg/s)
	mass flux of surface water into PM-13	M_s13 =	-	(mg/s)		27.86	(mg/s)		318	(mg/s)
	mass flux of ground water into PM-13	M_g13 =	1.37	(mg/s)		1.37	(mg/s)		1.37	(mg/s)
	mass flux of Area 5 Pit NW discharge	M_spit =	0.02	(mg/s)		0.17	(mg/s)		0.17	(mg/s)
	mass flux in seepage from Tailings Basin Cells 1E and 2E	M_fs =	0.62	(mg/s)		0.62	(mg/s)		0.62	(mg/s)
	mass flux in hydrometallurgical residue cells liner leakage	M_rrs =	0.00	(mg/s)		0.00	(mg/s)		0.00	(mg/s)
	mass flux in seepage from cell 2W	M_s2w =	0.55	(mg/s)		0.55	(mg/s)		0.55	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Mass balance at each node	mass flux in river at PM-12	M_r12 =	0.43	(mg/s)		6.14	(mg/s)		65.25	(mg/s)
	mass flux in river at PM-13	M_r13 =	3.00	(mg/s)		36.72	(mg/s)		386.07	(mg/s)
			Low Flow			**Average Flow**			**High Flow**	
Convert mass flux to concentration	concentration in river at PM-12	C_r12 =	0.013	(mg/L)		0.016	(mg/L)		0.016	(mg/L)
	concentration in river at PM-13	C_r13 =	0.012	(mg/L)		0.015	(mg/L)		0.016	(mg/L)