

2017
Mine Permit Groundwater Quality Monitoring Data
HW-1L (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		0.45	2.76	
ORP	mV	-		-232	-31.8	
pH	SU	9.0-10.0		8.38	8.56	
Specific Conductance	uS/cm	-		361	247.4	
Temperature	C	-		7.5	8.2	
Turbidity	NTU	-		29.4	10.69	
Water Elevation	ft MSL	-		1465.85	1448.78	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	20 (p)	< 5	< 5.0	< 5.0	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	16 (p)	< 4	< 4.0	< 4.0	-
Iron	ug/L	1134	700	670	610	-
Lead	ug/L	12 (p)	< 3	< 3.0	< 3.0	-
Lithium	ug/L	40 (p)	-	-	-	-
Manganese	ug/L	23	< 50	< 50	< 50	-
Mercury	ng/L	4.0 (p)	< 1	< 1.00	< 1.00	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	< 20	< 20	< 20	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	11	< 10	< 10	< 10	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	117	82	84	82	-
Alkalinity, Carbonate	mg/L	14	< 2	< 2.0	< 2.0	-
Chloride	mg/L	52	50	46	45	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	0.04	< .025	< .025	< .025	-
Nitrogen, Nitrate	mg/L	0.40 (p)	< .1	< .1	< .1	-
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.05	< .1	< .1	-
Sulfate	mg/L	24	24	25	25	-
Sulfide	mg/L	0.80 (p)	< 0.2	< 0.20	< 0.20	-
Major Cations						
Calcium	mg/L	35	25	26	24	-
Magnesium	mg/L	17	11	11	11	-
Potassium	mg/L	11	1.8	2.1	1.8	-
Sodium	mg/L	27	25	25	25	-
General						
Hardness	mg/L	157	110	114	111	-

2017
Mine Permit Groundwater Quality Monitoring Data
HW-1U LLA (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		1.05	2.01	
ORP	mV	-		-143	-50.4	
pH	SU	8.6-9.6		8.82	9.04	
Specific Conductance	uS/cm	-		4.69	324.5	
Temperature	C	-		7.03	8.18	
Turbidity	NTU	-		978	855.47	
Water Elevation	ft MSL	-		1489.96	1494.49	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	20 (p)	< 5	11	7.4	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	16 (p)	< 4	7.1	4.1	-
Iron	ug/L	800 (p)	470	35000	35000	-
Lead	ug/L	12 (p)	< 3	110	59	-
Lithium	ug/L	40 (p)	-	-	-	-
Manganese	ug/L	200 (p)	< 50	490	290	-
Mercury	ng/L	4.0 (p)	< 1	9.8	< 10.0	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	< 20	< 20	< 20	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	40 (p)	< 10	35	20	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	125	120	170	120	-
Alkalinity, Carbonate	mg/L	66	6.2	< 2.0	39	-
Chloride	mg/L	40 (p)	27	44	46	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	0.1 (p)	0.19	0.32	0.36	-
Nitrogen, Nitrate	mg/L	0.40 (p)	< .1	< .1	< .1	-
Nitrogen, Nitrite	mg/L	0.40 (p)	0.24	< .1	0.6	-
Sulfate	mg/L	58	76	130	150	-
Sulfide	mg/L	0.36	< 0.2	< 2.0	< 5.0	-
Major Cations						
Calcium	mg/L	29	10	61	61	-
Magnesium	mg/L	15	3.7	24	26	-
Potassium	mg/L	50	0.57	4.1	3.6	-
Sodium	mg/L	33	79	130	110	-
General						
Hardness	mg/L	132	70	130	158	-

2017
Mine Permit Groundwater Quality Monitoring Data
HW-1U UFB (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		0.59	0.98	
ORP	mV	-		-234	-179.6	
pH	SU	8.4-9.4		8.83	8.85	
Specific Conductance	uS/cm	-		210	97.2	
Temperature	C	-		5.81	8.05	
Turbidity	NTU	-		3.5	9.97	
Water Elevation	ft MSL	-		1530.25	1532.32	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	11	< 5	< 5.0	< 5.0	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	16 (p)	< 4	< 4.0	< 4.0	-
Iron	ug/L	800 (p)	< 200	< 200	< 200	-
Lead	ug/L	12 (p)	< 3	< 3.0	< 3.0	-
Lithium	ug/L	40 (p)	-	-	-	-
Manganese	ug/L	75.3	< 50	< 50	< 50	-
Mercury	ng/L	4.0 (p)	< 1	< 1.00	< 1.00	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	< 20	< 20	< 20	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	40 (p)	< 10	< 10	< 10	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	127.11	94	88	63	-
Alkalinity, Carbonate	mg/L	13.76	10	6.2	4.1	-
Chloride	mg/L	120.74	< 10	< 10	< 10	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	0.12 (p)	< .025	< .025	< .025	-
Nitrogen, Nitrate	mg/L	0.67	< .1	< .1	< .1	-
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.05	< .1	< .1	-
Sulfate	mg/L	76.15	7.4	5.6	1.5	-
Sulfide	mg/L	1.31	< 0.2	< 0.20	< 0.20	-
Major Cations						
Calcium	mg/L	45.61	19	15	14	-
Magnesium	mg/L	17.38	6.1	6	3.9	-
Potassium	mg/L	21.78	4.7	5.2	2.3	-
Sodium	mg/L	90.93	19	17	6.9	-
General						
Hardness	mg/L	188.88	70	68	46	-

2017
Mine Permit Groundwater Quality Monitoring Data
HW-2 (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		0.3	0.46	
ORP	mV	-		-181	-219.7	
pH	SU	7.7-8.7		7.74	8.3	
Specific Conductance	uS/cm	-		644	456	
Temperature	C	-		9	10.04	
Turbidity	NTU	-		39	110.3	
Water Elevation	ft MSL	-		1530.24	1532.01	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	20 (p)	< 5	< 5.0	< 5.0	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	16 (p)	< 4	< 4.0	< 4.0	-
Iron	ug/L	3401.08	590	1400	< 200	-
Lead	ug/L	12 (p)	< 3	< 3.0	< 3.0	-
Lithium	ug/L	40 (p)	-	-	-	-
Manganese	ug/L	323.84	170	320	170	-
Mercury	ng/L	1.31	< 1	< 1.00	< 1.00	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	< 20	< 20	< 20	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	40 (p)	< 10	< 10	< 10	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	145.02	120	110	120	-
Alkalinity, Carbonate	mg/L	8.0 (p)	< 2	< 2.0	< 2.0	-
Chloride	mg/L	25.13	27	28	28	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	0.047	0.087	0.073	0.06	-
Nitrogen, Nitrate	mg/L	0.40 (p)	< .1	< .1	< .1	-
Nitrogen, Nitrite	mg/L	0.40 (p)	< .1	< .1	< .1	-
Sulfate	mg/L	134.73	160	150	150	-
Sulfide	mg/L	0.47	< 0.2	< 0.20	< 0.20	-
Major Cations						
Calcium	mg/L	72.1	60	59	56	-
Magnesium	mg/L	27.74	25	25	24	-
Potassium	mg/L	7.08	4.7	5.1	4.9	-
Sodium	mg/L	15.47	26	27	26	-
General						
Hardness	mg/L	277.43	256	254	261	-

2017
Mine Permit Groundwater Quality Monitoring Data
HW-8U (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		0.81	1.78	
ORP	mV	-		-120	-92.2	
pH	SU	6.4-7.4		7.16	6.85	
Specific Conductance	uS/cm	-		268	223.2	
Temperature	C	-		7.52	8.25	
Turbidity	NTU	-		1.9	3.96	
Water Elevation	ft MSL	-		1531.57	1534.27	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	20 (p)	8.9	7.3	5.3	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	16 (p)	< 4	< 4.0	< 4.0	-
Iron	ug/L	27124.65	10000	8300	7800	-
Lead	ug/L	12 (p)	< 3	< 3.0	< 3.0	-
Lithium	ug/L	40 (p)	-	-	-	-
Manganese	ug/L	5498	5400	4900	3800	-
Mercury	ng/L	4.0 (p)	< 1	< 1.00	< 1.00	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	< 20	< 20	< 20	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	25.72	< 10	< 10	< 10	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	237.47	160	140	130	-
Alkalinity, Carbonate	mg/L	8.0 (p)	< 2	< 2.0	< 2.0	-
Chloride	mg/L	40 (p)	13	13	13	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	0.04	< .025	< .025	< .025	-
Nitrogen, Nitrate	mg/L	0.1	< .1	< .1	< .1	-
Nitrogen, Nitrite	mg/L	0.40 (p)	< .1	< .1	< .1	-
Sulfate	mg/L	2.64	9	8.9	9.6	-
Sulfide	mg/L	0.80 (p)	< 0.2	< 0.20	< 0.20	-
Major Cations						
Calcium	mg/L	53.48	39	33	31	-
Magnesium	mg/L	22.17	13	11	12	-
Potassium	mg/L	4.07	3.5	2.9	3.0	-
Sodium	mg/L	4.43	4.1	3.3	3.2	-
General						
Hardness	mg/L	224.05	162	148	141	-

2017
Mine Permit Groundwater Quality Monitoring Data
HYG-1 (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		0.34	0.22	
ORP	mV	-		33	21.7	
pH	SU	6.25-7.25		6.64	6.78	
Specific Conductance	uS/cm	-		865	565.4	
Temperature	C	-		8	7.46	
Turbidity	NTU	-		1.1	2.21	
Water Elevation	ft MSL	-		1530.72	1532.87	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	20 (p)	< 5	< 5.0	< 5.0	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	4.4	< 4	4.2	< 4.0	-
Iron	ug/L	800(p)	< 200	< 200	< 200	-
Lead	ug/L	12 (p)	< 3	< 3.0	< 3.0	-
Lithium	ug/L	40 (p)	-	-	-	-
Manganese	ug/L	286	340	440	380	-
Mercury	ng/L	6.2	17.1	26.3	29.2	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	< 20	< 20	< 20	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	19	< 10	< 10	< 10	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	157	210	370	250	-
Alkalinity, Carbonate	mg/L	8.0 (p)	< 2	< 2.0	< 2.0	-
Chloride	mg/L	12	18	11	< 10	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	0.38	0.49	0.34	0.46	-
Nitrogen, Nitrate	mg/L	0.26	< .1	< .1	< .1	-
Nitrogen, Nitrite	mg/L	0.40 (p)	< .1	< .1	< .1	-
Sulfate	mg/L	98	53	100	120	-
Sulfide	mg/L	0.80 (p)	< 0.2	< 0.20	< 0.20	-
Major Cations						
Calcium	mg/L	52	38	61	50	-
Magnesium	mg/L	28	20	31	26	-
Potassium	mg/L	8.4	8.3	13	11	-
Sodium	mg/L	14	39	78	59	-
General						
Hardness	mg/L	230	186	300	248	-

2017
Mine Permit Groundwater Quality Monitoring Data
KMW-5R (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		NM	NM	
ORP	mV	-		NM	NM	
pH	SU	6.7-7.7		NM	NM	
Specific Conductance	uS/cm	-		NM	NM	
Temperature	C	-		NM	NM	
Turbidity	NTU	-		NM	NM	
Water Elevation	ft MSL	-		1557.2	1560.44	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	6	< 5	< 5.0	< 5.0	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	14.6	< 4	8	< 4.0	-
Iron	ug/L	33432	< 200	13000	400	-
Lead	ug/L	4.8	< 3	< 3.0	< 3.0	-
Lithium	ug/L	40 (p)	-	-	-	-
Manganese	ug/L	2815	1900	2100	1600	-
Mercury	ng/L	2.1	< 1	7.42	< 1.00	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	< 20	< 20	< 20	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	19.05	< 10	< 10	< 10	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	486.4	380	380	400	-
Alkalinity, Carbonate	mg/L	3.31	< 2	< 2.0	< 2.0	-
Chloride	mg/L	139.4	23	17	< 10	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	0.76	0.038	0.03	0.054	-
Nitrogen, Nitrate	mg/L	0.11	< .1	< .1	< .1	-
Nitrogen, Nitrite	mg/L	0.06	< .1	< .1	< .1	-
Sulfate	mg/L	123.12	130	120	110	-
Sulfide	mg/L	3.88	< 0.2	< 0.20	< 0.20	-
Major Cations						
Calcium	mg/L	168.98	120	130	120	-
Magnesium	mg/L	66.57	46	51	47	-
Potassium	mg/L	9.05	7.1	7.6	7.3	-
Sodium	mg/L	50.02	5.3	5.8	7.2	-
General						
Hardness	mg/L	800	520	504	277	-

2017
Mine Permit Groundwater Quality Monitoring Data
MW-701 QAL (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		5.06	7.69	
ORP	mV	-		182	148.2	
pH	SU	5.8-6.8		5.9	5.84	
Specific Conductance	uS/cm	-		143	97	
Temperature	C	-		6.6	7.71	
Turbidity	NTU	-		2.2	4.01	
Water Elevation	ft MSL	-		1530.36	1532.5	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	20 (p)	< 5	< 5.0	< 5.0	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	16 (p)	< 4	< 4.0	< 4.0	-
Iron	ug/L	458.54	< 200	< 200	< 200	-
Lead	ug/L	12 (p)	< 3	< 3.0	< 3.0	-
Lithium	ug/L	40 (p)	-	-	-	-
Manganese	ug/L	4800.88	< 50	< 50	< 50	-
Mercury	ng/L	11.19	< 1	1.2	< 1.00	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	< 20	< 20	< 20	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	40 (p)	< 10	< 10	< 10	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	189.4	32	41	44	-
Alkalinity, Carbonate	mg/L	8.0 (p)	< 2	< 2.0	< 2.0	-
Chloride	mg/L	18.59	< 10	< 10	< 10	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	0.39	< .025	< .025	< .025	-
Nitrogen, Nitrate	mg/L	3.1	0.56	0.94	0.5	-
Nitrogen, Nitrite	mg/L	0.40 (p)	< .1	< .1	< .1	-
Sulfate	mg/L	109.52	17	19	20	-
Sulfide	mg/L	0.22	< 0.2	< 0.20	< 0.20	-
Major Cations						
Calcium	mg/L	57.31	8.5	10	10	-
Magnesium	mg/L	26.33	3.9	4.7	4.5	-
Potassium	mg/L	9.18	2.8	3	2.5	-
Sodium	mg/L	14.29	6.3	6.6	6.6	-
General						
Hardness	mg/L	271.75	36	48	48	-

2017
Mine Permit Groundwater Quality Monitoring Data
MW-701 UFB (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		0.09	0.2	
ORP	mV	-		-216	-237.8	
pH	SU	7.2-8.2		7.34	7.49	
Specific Conductance	uS/cm	-		394	359.7	
Temperature	C	-		7.5	7.66	
Turbidity	NTU	-		49	47.9	
Water Elevation	ft MSL	-		1530.55	1532.83	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	20 (p)	< 5	< 5.0	< 5.0	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	30.27	< 4	< 4.0	9.0	-
Iron	ug/L	27404.89	17000	18000	16000	-
Lead	ug/L	12 (p)	< 3	< 3.0	< 3.0	-
Lithium	ug/L	40 (p)	-	-	-	-
Manganese	ug/L	6881.06	2200	2200	1900	-
Mercury	ng/L	4.0 (p)	< 1	< 1.00	< 1.00	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	< 20	< 20	< 20	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	26.48	< 10	< 10	< 10	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	171.66	150	150	140	-
Alkalinity, Carbonate	mg/L	18.42	< 2	< 2.0	< 2.0	-
Chloride	mg/L	43.13	< 10	< 10	< 10	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	1.6	< .025	< .025	0.053	-
Nitrogen, Nitrate	mg/L	0.40 (p)	< .1	< .1	< .1	-
Nitrogen, Nitrite	mg/L	0.40 (p)	< .1	< .1	< .1	-
Sulfate	mg/L	80.45	21	16	6.8	-
Sulfide	mg/L	1.7	< 0.2	< 0.20	< 0.20	-
Major Cations						
Calcium	mg/L	40.07	34	32	30	-
Magnesium	mg/L	16.19	15	14	13	-
Potassium	mg/L	12.53	3	3	3.2	-
Sodium	mg/L	55.79	4.8	4.6	4.7	-
General						
Hardness	mg/L	163.45	156	152	141	-

2017
Mine Permit Groundwater Quality Monitoring Data
MW-702 QAL (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		1.05	1.53	
ORP	mV	-		123	-47.5	
pH	SU	9.8-10.8		6.88	10.84	
Specific Conductance	uS/cm	-		488	444.1	
Temperature	C	-		7	7.08	
Turbidity	NTU	-		30.8	6.19	
Water Elevation	ft MSL	-		1529.76	1531.47	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	7.52	< 5	< 5.0	5.4	-
Barium	ug/L	154.72	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	16 (p)	< 4	< 4.0	< 4.0	-
Iron	ug/L	386.05	< 200	< 200	< 200	-
Lead	ug/L	12 (p)	< 3	< 3.0	< 3.0	-
Lithium	ug/L	40 (p)	-	-	-	-
Manganese	ug/L	717.08	97	91	< 50	-
Mercury	ng/L	4.0 (p)	< 1	1.34	< 1.00	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	< 20	< 20	< 20	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	40 (p)	< 10	< 10	< 10	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	193.52	130	130	80	-
Alkalinity, Carbonate	mg/L	53.68	< 2	< 2.0	12	-
Chloride	mg/L	12.47	< 10	< 10	< 10	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	0.03	< .025	< .025	< .025	-
Nitrogen, Nitrate	mg/L	1.8	0.63	0.52	1.1	-
Nitrogen, Nitrite	mg/L	0.12	< .1	< .1	< .1	-
Sulfate	mg/L	148.08	86	84	86	-
Sulfide	mg/L	0.80 (p)	< 0.2	< 0.20	< 0.20	-
Major Cations						
Calcium	mg/L	99.4	36	34	34	-
Magnesium	mg/L	17.29	10	9.7	5.8	-
Potassium	mg/L	36.44	4.8	4.7	12	-
Sodium	mg/L	42.19	41	41	60	-
General						
Hardness	mg/L	285.53	134	124	113	-

2017
Mine Permit Groundwater Quality Monitoring Data
MW-702 UFB (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		5.83	3.32	
ORP	mV	-		-72	-110.8	
pH	SU	8.5-9.5		8.13	7.97	
Specific Conductance	uS/cm	-		118	171.2	
Temperature	C	-		5.6	6.92	
Turbidity	NTU	-		8.1	12.69	
Water Elevation	ft MSL	-		1533.03	1531.08	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	20 (p)	< 5	< 5.0	< 5.0	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	16 (p)	< 4	< 4.0	< 4.0	-
Iron	ug/L	2484	630	650	640	-
Lead	ug/L	12 (p)	< 3	< 3.0	< 3.0	-
Lithium	ug/L	40 (p)	-	-	-	-
Manganese	ug/L	126	78	79	75	-
Mercury	ng/L	4.0 (p)	< 1	< 1.00	< 1.00	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	< 20	< 20	< 20	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	66	< 10	< 10	< 10	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	125	94	94	93	-
Alkalinity, Carbonate	mg/L	15	< 2	< 2.0	< 2.0	-
Chloride	mg/L	40 (p)	< 10	< 10	< 10	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	0.12 (p)	< .025	< .025	< .025	-
Nitrogen, Nitrate	mg/L	0.40 (p)	< .1	< .1	< .1	-
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.05	< .1	< .1	-
Sulfate	mg/L	36	33	34	35	-
Sulfide	mg/L	0.80 (p)	< 0.2	< 0.20	< 0.20	-
Major Cations						
Calcium	mg/L	49	29	31	30	-
Magnesium	mg/L	14	9.5	10	9.8	-
Potassium	mg/L	22	3.2	3.4	2.9	-
Sodium	mg/L	8	3.2	3.4	3.1	-
General						
Hardness	mg/L	160	116	112	121	-

2017
Mine Permit Groundwater Quality Monitoring Data
MW-703 DBA (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		0.92	1.59	
ORP	mV	-		-255	-163.7	
pH	SU	8.7-9.7		9.42	10.68	
Specific Conductance	uS/cm	-		252	199.8	
Temperature	C	-		5.1	6.91	
Turbidity	NTU	-		2.31	20.91	
Water Elevation	ft MSL	-		1530.61	1532.65	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	20 (p)	< 5	< 5.0	< 5.0	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	16 (p)	< 4	< 4.0	< 4.0	-
Iron	ug/L	2738	< 200	< 200	< 200	-
Lead	ug/L	12 (p)	< 3	< 3.0	< 3.0	-
Lithium	ug/L	17	-	-	-	-
Manganese	ug/L	60	< 50	< 50	< 50	-
Mercury	ng/L	4.0 (p)	< 1	< 1.00	< 1.00	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	< 20	< 20	< 20	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	22	< 10	< 10	< 10	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	74	79	58	53	-
Alkalinity, Carbonate	mg/L	27	10	25	21	-
Chloride	mg/L	20	18	16	17	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	0.12	0.05	< .025	0.044	-
Nitrogen, Nitrate	mg/L	0.11	< .1	< .1	< .1	-
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.05	< .1	< .1	-
Sulfate	mg/L	91	17	16	19	-
Sulfide	mg/L	0.80 (p)	< 0.2	0.78	0.43	-
Major Cations						
Calcium	mg/L	29	19	11	9.3	-
Magnesium	mg/L	17	13	9.4	7.1	-
Potassium	mg/L	15	11	21	24	-
Sodium	mg/L	14	8.2	11	13	-
General						
Hardness	mg/L	137	98	68	55	-

2017
Mine Permit Groundwater Quality Monitoring Data
MW-703 LLA (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		0.26	0.55	
ORP	mV	-		-271	-256.7	
pH	SU	8.2-9.2		8.39	8.38	
Specific Conductance	uS/cm	-		270	182.9	
Temperature	C	-		6.28	6.87	
Turbidity	NTU	-		6.1	4.85	
Water Elevation	ft MSL	-		1531.33	1533.27	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	20 (p)	< 5	< 5.0	< 5.0	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	16 (p)	< 4	< 4.0	< 4.0	-
Iron	ug/L	2965.88	750	560	580	-
Lead	ug/L	12 (p)	< 3	< 3.0	< 3.0	-
Lithium	ug/L	30.13	-	-	-	-
Manganese	ug/L	100.53	79	73	82	-
Mercury	ng/L	4.0 (p)	< 1	< 1.00	< 1.00	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	< 20	< 20	< 20	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	40+	< 10	< 10	< 10	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	83.95	86	83	81	-
Alkalinity, Carbonate	mg/L	3.97	< 2	< 2.0	< 2.0	-
Chloride	mg/L	124.08	12	11	11	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	0.08	0.038	< .025	0.044	-
Nitrogen, Nitrate	mg/L	0.40 (p)	< .1	< .1	< .1	-
Nitrogen, Nitrite	mg/L	0.40 (p)	< 0.05	< .1	< .1	-
Sulfate	mg/L	43.63	32	32	32	-
Sulfide	mg/L	0.80 (p)	< 0.2	< 0.20	< 0.20	-
Major Cations						
Calcium	mg/L	38.89	26	26	24	-
Magnesium	mg/L	13.27	11	11	10	-
Potassium	mg/L	9.67	3.6	3.8	2.9	-
Sodium	mg/L	66.85	6.5	8.3	6.3	-
General						
Hardness	mg/L	137.58	112	108	111	-

2017
Mine Permit Groundwater Quality Monitoring Data
MW-703 QAL (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		6.62	6.75	
ORP	mV	-		104	164.1	
pH	SU	7.2-8.2		6.33	6.14	
Specific Conductance	uS/cm	-		260	127.2	
Temperature	C	-		6.4	6.36	
Turbidity	NTU	-		1.75	4.56	
Water Elevation	ft MSL	-		1532.86	1535.25	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	20 (p)	< 5	< 5.0	< 5.0	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	16 (p)	< 4	< 4.0	< 4.0	-
Iron	ug/L	255.36	< 200	< 200	< 200	-
Lead	ug/L	12 (p)	< 3	< 3.0	< 3.0	-
Lithium	ug/L	40 (p)	-	-	-	-
Manganese	ug/L	105.05	< 50	< 50	< 50	-
Mercury	ng/L	4.0 (p)	< 1	< 1.00	< 1.00	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	< 20	< 20	< 20	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	40 (p)	< 10	< 10	< 10	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	99.57	58	56	58	-
Alkalinity, Carbonate	mg/L	8.0 (p)	< 2	< 2.0	< 2.0	-
Chloride	mg/L	40 (p)	< 10	< 10	< 10	-
Fluoride	mg/L	131.24	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	0.12 (p)	< .025	< .025	< .025	-
Nitrogen, Nitrate	mg/L	0.22	1.1	1.3	1.3	-
Nitrogen, Nitrite	mg/L	0.40 (p)	< .1	< .1	< .1	-
Sulfate	mg/L	49.72	13	14	20	-
Sulfide	mg/L	0.3	< 0.2	< 0.20	< 0.20	-
Major Cations						
Calcium	mg/L	39.66	16	15	18	-
Magnesium	mg/L	10.72	6.7	6	7.4	-
Potassium	mg/L	3.13	1.5	1.4	1.7	-
Sodium	mg/L	10.48	2.6	2.3	2.3	-
General						
Hardness	mg/L	135.72	66	70	77	-

2017
Mine Permit Groundwater Quality Monitoring Data
MW-703 UFB (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		1.53	1.43	
ORP	mV	-		3.5	-164.7	
pH	SU	8.3-9.3		8.44	7.9	
Specific Conductance	uS/cm	-		156	186.6	
Temperature	C	-		6.2	6.47	
Turbidity	NTU	-		8.55	4.57	
Water Elevation	ft MSL	-		1531.45	1533.05	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	20 (p)	< 5	< 5.0	< 5.0	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	16 (p)	< 4	< 4.0	< 4.0	-
Iron	ug/L	2440.99	1500	640	610	-
Lead	ug/L	12 (p)	< 3	< 3.0	< 3.0	-
Lithium	ug/L	40 (p)	-	-	-	-
Manganese	ug/L	193.95	170	160	180	-
Mercury	ng/L	4.0 (p)	< 1	< 1.00	< 1.00	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	< 20	< 20	< 20	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	13.75	< 10	< 10	< 10	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	127.42	81	83	85	-
Alkalinity, Carbonate	mg/L	28.25	< 2	< 2.0	< 2.0	-
Chloride	mg/L	40 (p)	< 10	< 10	< 10	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	0.47	< .025	< .025	< .025	-
Nitrogen, Nitrate	mg/L	0.4 (p)	< .1	< .1	< .1	-
Nitrogen, Nitrite	mg/L	0.4 (p)	< 0.05	< .1	< .1	-
Sulfate	mg/L	52.89	45	46	46	-
Sulfide	mg/L	0.80 (p)	< 0.2	< 0.20	< 0.20	-
Major Cations						
Calcium	mg/L	53.06	31	31	31	-
Magnesium	mg/L	16.52	11	11	11	-
Potassium	mg/L	5.87	2.4	2.4	2.4	-
Sodium	mg/L	35.15	3.1	2.9	2.9	-
General						
Hardness	mg/L	193.1	124	124	127	-

2017
Mine Permit Groundwater Quality Monitoring Data
MW-704 DBA (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		0.51	0.68	
ORP	mV	-		-324	-210.3	
pH	SU	8.6-9.6		8.71	8.43	
Specific Conductance	uS/cm	-		218	217.5	
Temperature	C	-		8.08	7.87	
Turbidity	NTU	-		3.5	10.4	
Water Elevation	ft MSL	-		1531.08	1533.89	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	20 (p)	< 5	< 5.0	< 5.0	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1480	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	16 (p)	< 4	< 4.0	< 4.0	-
Iron	ug/L	9645	600	650	800	-
Lead	ug/L	12 (p)	< 3	< 3.0	< 3.0	-
Lithium	ug/L	40 (p)	-	-	-	-
Manganese	ug/L	58	51	< 50	54	-
Mercury	ng/L	4.0 (p)	< 1	< 1.00	< 1.00	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	< 20	< 20	< 20	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	11	< 10	< 10	< 10	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	129	130	130	140	-
Alkalinity, Carbonate	mg/L	32	4.1	2.1	2.0	-
Chloride	mg/L	40 (p)	< 10	< 10	< 10	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	0.04	< .025	< .025	< .025	-
Nitrogen, Nitrate	mg/L	0.40 (p)	< .1	< .1	< .1	-
Nitrogen, Nitrite	mg/L	0.40 (p)	< .1	< .1	< .1	-
Sulfate	mg/L	6	< 1	< 1.0	< 1.0	-
Sulfide	mg/L	0.80 (p)	< 0.2	< 0.20	< 0.20	-
Major Cations						
Calcium	mg/L	27	22	20	22	-
Magnesium	mg/L	14	12	10	12	-
Potassium	mg/L	4	2.8	2.4	2.6	-
Sodium	mg/L	14	11	10	11	-
General						
Hardness	mg/L	111	108	100	113	-

2017
Mine Permit Groundwater Quality Monitoring Data
MW-704 LLA (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		0.72	1.73	
ORP	mV	-		-180	-139.9	
pH	SU	8.2-9.2		8.03	8.02	
Specific Conductance	uS/cm	-		296	265.7	
Temperature	C	-		4.19	7.77	
Turbidity	NTU	-		10.05	24.2	
Water Elevation	ft MSL	-		1530.88	1533.63	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	20 (p)	< 5	< 5.0	< 5.0	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	16 (p)	< 4	< 4.0	< 4.0	-
Iron	ug/L	4974	650	870	730	-
Lead	ug/L	12 (p)	< 3	< 3.0	< 3.0	-
Lithium	ug/L	40 (p)	-	-	-	-
Manganese	ug/L	90	50	84	83	-
Mercury	ng/L	4.0 (p)	< 1	< 1.00	< 1.00	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	< 20	< 20	< 20	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	11	< 10	< 10	< 10	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	132	120	150	140	-
Alkalinity, Carbonate	mg/L	10	4.1	< 2.0	< 2.0	-
Chloride	mg/L	40 (p)	< 10	< 10	< 10	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	0.12 (p)	< .025	< .025	0.025	-
Nitrogen, Nitrate	mg/L	0.40 (p)	< .1	< .1	< .1	-
Nitrogen, Nitrite	mg/L	0.40 (p)	< .1	< .1	< .1	-
Sulfate	mg/L	23	5.7	9.1	7.8	-
Sulfide	mg/L	0.80 (p)	< 0.2	< 0.20	< 0.20	-
Major Cations						
Calcium	mg/L	33	19	31	28	-
Magnesium	mg/L	17	12	14	13	-
Potassium	mg/L	5	8.1	4.5	3.9	-
Sodium	mg/L	5	5.1	3.8	3.6	-
General						
Hardness	mg/L	149	98	140	145	-

2017
Mine Permit Groundwater Quality Monitoring Data
MW-704 QAL (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		0.11	0.5	
ORP	mV	-		55	-44.7	
pH	SU	5.5-6.5		5.9	6.04	
Specific Conductance	uS/cm	-		451	502.9	
Temperature	C	-		7.3	7.1	
Turbidity	NTU	-		2	4.09	
Water Elevation	ft MSL	-		1530.39	1533.08	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	24	< 5	< 5.0	< 5.0	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	16 (p)	< 4	< 4.0	< 4.0	-
Iron	ug/L	37038	2200	6900	86000	-
Lead	ug/L	12 (p)	< 3	< 3.0	< 3.0	-
Lithium	ug/L	40 (p)	-	-	-	-
Manganese	ug/L	7914	3900	7000	< 50	-
Mercury	ng/L	5.95	9.69	18	12.3	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	< 20	< 20	< 20	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	44 (p)	< 10	< 10	< 10	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	241	140	160	250	-
Alkalinity, Carbonate	mg/L	8.0 (p)	< 2	< 2.0	< 2.0	-
Chloride	mg/L	18	16	16	16	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	0.04	0.089	0.1	0.23	-
Nitrogen, Nitrate	mg/L	0.17	0.74	0.47	< .1	-
Nitrogen, Nitrite	mg/L	0.40 (p)	< .1	< .1	< .1	-
Sulfate	mg/L	23	38	32	9.2	-
Sulfide	mg/L	0.80 (p)	< 0.2	< 0.20	< 0.20	-
Major Cations						
Calcium	mg/L	51	40	38	42	-
Magnesium	mg/L	9	11	10	15	-
Potassium	mg/L	3.11	3.2	2.7	3.7	-
Sodium	mg/L	27	21	22	29	-
General						
Hardness	mg/L	185	156	160	192	-

2017
Mine Permit Groundwater Quality Monitoring Data
MW-704 UFB (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		0.09	0.89	
ORP	mV	-		-150	-171.6	
pH	SU	6.4-7.4		6.97	7.23	
Specific Conductance	uS/cm	-		506	297.5	
Temperature	C	-		7.6	7.68	
Turbidity	NTU	-		149	43.68	
Water Elevation	ft MSL	-		1530.75	1533.42	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	20 (p)	< 5	< 5.0	< 5.0	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	5	< 4	< 4.0	< 4.0	-
Iron	ug/L	23040	28000	14000	20000	-
Lead	ug/L	4	< 3	< 3.0	< 3.0	-
Lithium	ug/L	40 (p)	-	-	-	-
Manganese	ug/L	618	1000	1000	1300	-
Mercury	ng/L	2	< 1	< 1.00	< 1.00	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	< 20	< 20	< 20	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	15	< 10	< 10	< 10	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	181	160	170	170	-
Alkalinity, Carbonate	mg/L	8.0 (p)	< 2	< 2.0	< 2.0	-
Chloride	mg/L	18	19	15	12	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	0.27	0.031	0.026	< .025	-
Nitrogen, Nitrate	mg/L	0.40 (p)	< .1	< .1	< .1	-
Nitrogen, Nitrite	mg/L	0.14	< .1	< .1	< .1	-
Sulfate	mg/L	38	47	31	12	-
Sulfide	mg/L	0.80 (p)	< 0.2	< 0.20	< 0.20	-
Major Cations						
Calcium	mg/L	38	56	50	47	-
Magnesium	mg/L	7	11	9.8	10	-
Potassium	mg/L	4	4.1	3.8	3.9	-
Sodium	mg/L	65	7.6	6.4	6.2	-
General						
Hardness	mg/L	106	198	186	180	-

2017
Mine Permit Groundwater Quality Monitoring Data
MW-705 QAL (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		0.48	1.95	
ORP	mV	-		-54	139.7	
pH	SU	5.6-6.6		6.29	5.72	
Specific Conductance	uS/cm	-		345	124.8	
Temperature	C	-		6.3	6.98	
Turbidity	NTU	-		1.6	2.8	
Water Elevation	ft MSL	-		1533.45	1536.89	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	20 (p)	< 5	< 5.0	< 5.0	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	16 (p)	< 4	< 4.0	< 4.0	-
Iron	ug/L	14081	8700	10000	1900	-
Lead	ug/L	12 (p)	< 3	< 3.0	< 3.0	-
Lithium	ug/L	40 (p)	-	-	-	-
Manganese	ug/L	1674	750	< 1200	280	-
Mercury	ng/L	1	< 1	< 1.00	< 1.00	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	< 20	< 20	< 20	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	174	< 10	< 10	< 10	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	94	61	78	35	-
Alkalinity, Carbonate	mg/L	8.0 (p)	< 2	< 2.0	< 2.0	-
Chloride	mg/L	66	32	25	29	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	0.096	0.11	0.083	0.062	-
Nitrogen, Nitrate	mg/L	0.40 (p)	< .1	< .1	< .1	-
Nitrogen, Nitrite	mg/L	0.40 (p)	< .1	< .1	< .1	-
Sulfate	mg/L	6	5	11	13	-
Sulfide	mg/L	0.80 (p)	< 0.2	< 0.20	< 0.20	-
Major Cations						
Calcium	mg/L	27	15	16	13	-
Magnesium	mg/L	13	6.7	7.1	5.6	-
Potassium	mg/L	3	2.7	2.5	2.1	-
Sodium	mg/L	17	13	13	11	-
General						
Hardness	mg/L	115	70	74	59	-

2017
Mine Permit Groundwater Quality Monitoring Data
MW-705 UFB (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		1	0.43	
ORP	mV	-		-106	-111.1	
pH	SU	6.7-7.7		6.89	6.86	
Specific Conductance	uS/cm	-		38	302.7	
Temperature	C	-		7.3	7.21	
Turbidity	NTU	-		24.7	6.7	
Water Elevation	ft MSL	-		1533.16	1536.87	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	20 (p)	< 5	< 5.0	< 5.0	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	16 (p)	< 4	< 4.0	< 4.0	-
Iron	ug/L	11214	9700	10000	10000	-
Lead	ug/L	12 (p)	< 3	< 3.0	< 3.0	-
Lithium	ug/L	40 (p)	-	-	-	-
Manganese	ug/L	866	710	900	910	-
Mercury	ng/L	4.0 (p)	< 1	< 1.00	< 1.00	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	< 20	< 20	< 20	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	17	< 10	< 10	< 10	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	103	86	84	88	-
Alkalinity, Carbonate	mg/L	8.0 (p)	< 2	< 2.0	< 2.0	-
Chloride	mg/L	40 (p)	24	25	28	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	0.12 (p)	< .025	< .025	< .025	-
Nitrogen, Nitrate	mg/L	0.40 (p)	< .1	< .1	< .1	-
Nitrogen, Nitrite	mg/L	0.40 (p)	< .1	< .1	< .1	-
Sulfate	mg/L	15	4.7	2.7	3.4	-
Sulfide	mg/L	0.80 (p)	< 0.2	< 0.20	< 0.20	-
Major Cations						
Calcium	mg/L	26	23	23	23	-
Magnesium	mg/L	12	12	12	12	-
Potassium	mg/L	4	3.9	4.1	3.3	-
Sodium	mg/L	3	3	3.1	2.9	-
General						
Hardness	mg/L	111	110	114	121	-

2017
Mine Permit Groundwater Quality Monitoring Data
MW-706 QAL (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		0.3	0.71	
ORP	mV	-		38.6	55.5	
pH	SU	6.2-7.2		6	5.92	
Specific Conductance	uS/cm	-		1021	842.1	
Temperature	C	-		7.8	10.12	
Turbidity	NTU	-		20.1	1.96	
Water Elevation	ft MSL	-		1558.91	1536.89	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	16	< 5	< 5.0	< 5.0	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	16 (p)	< 4	< 4.0	< 4.0	-
Iron	ug/L	10846	4300	4700	3900	-
Lead	ug/L	12 (p)	< 3	< 3.0	< 3.0	-
Lithium	ug/L	40 (p)	-	-	-	-
Manganese	ug/L	27225	18000	18000	17000	-
Mercury	ng/L	4.0 (p)	< 1	< 1.00	< 1.00	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	26	25	23	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	55	< 10	< 10	< 10	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	153	75	78	71	-
Alkalinity, Carbonate	mg/L	8.0 (p)	< 2	< 2.0	< 2.0	-
Chloride	mg/L	105	150	150	150	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	1.4	0.43	0.45	0.48	-
Nitrogen, Nitrate	mg/L	0.4 (p)	< .1	0.44	< .1	-
Nitrogen, Nitrite	mg/L	0.4 (p)	< .1	< .1	< .1	-
Sulfate	mg/L	479	200	210	210	-
Sulfide	mg/L	0.80 (p)	< 0.2	< 0.20	< 0.20	-
Major Cations						
Calcium	mg/L	183	88	88	86	-
Magnesium	mg/L	56	34	35	35	-
Potassium	mg/L	6	4.5	4.7	5.2	-
Sodium	mg/L	234	29	37	36	-
General						
Hardness	mg/L	609	6	80	6	-

2017
Mine Permit Groundwater Quality Monitoring Data
MW-707 QAL (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		0.5	0.56	
ORP	mV	-		-150	-116.8	
pH	SU	6.3-7.3		7.11	6.81	
Specific Conductance	uS/cm	-		402	251.7	
Temperature	C	-		7.3	7.69	
Turbidity	NTU	-		1.3	1.8	
Water Elevation	ft MSL	-		1582.3	1583.8	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	20 (p)	< 5	< 5.0	< 5.0	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	16 (p)	< 4	< 4.0	4.8	-
Iron	ug/L	7493	4900	5200	4800	-
Lead	ug/L	12 (p)	< 3	< 3.0	< 3.0	-
Lithium	ug/L	40 (p)	-	-	-	-
Manganese	ug/L	1189	810	1000	910	-
Mercury	ng/L	4.0 (p)	< 1	< 1.00	< 1.00	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	< 20	< 20	< 20	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	19	< 10	< 10	< 10	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	150	160	160	170	-
Alkalinity, Carbonate	mg/L	8.0 (p)	< 2	< 2.0	< 2.0	-
Chloride	mg/L	40 (p)	< 10	< 10	< 10	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	0.34	0.23	0.26	0.3	-
Nitrogen, Nitrate	mg/L	0.40 (p)	< .1	< .1	< .1	-
Nitrogen, Nitrite	mg/L	0.40 (p)	< .1	< .1	< .1	-
Sulfate	mg/L	8	5.2	5.3	5.4	-
Sulfide	mg/L	0.80 (p)	< 0.2	< 0.20	< 0.20	-
Major Cations						
Calcium	mg/L	51	41	42	40	-
Magnesium	mg/L	15	12	12	12	-
Potassium	mg/L	3	2.5	2.6	2.4	-
Sodium	mg/L	4	2.9	2.8	3.1	-
General						
Hardness	mg/L	149	156	154	160	-

2017
Mine Permit Groundwater Quality Monitoring Data
MW-9R (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		4	1.65	
ORP	mV	-		199	128.8	
pH	SU	5.4-6.4		5.94	6.04	
Specific Conductance	uS/cm	-		736	214.5	
Temperature	C	-		9	9.41	
Turbidity	NTU	-		1.8	383.75	
Water Elevation	ft MSL	-		1596.87	1597.03	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	8.0 (p)	-	-	-	-
Arsenic	ug/L	25	< 5	< 5.0	< 5.0	-
Barium	ug/L	400 (p)	-	-	-	-
Beryllium	ug/L	4.0 (p)	-	-	-	-
Boron	ug/L	1200 (p)	-	-	-	-
Cadmium	ug/L	4.0 (p)	-	-	-	-
Chromium	ug/L	40 (p)	-	-	-	-
Cobalt	ug/L	80 (p)	-	-	-	-
Copper	ug/L	5	< 4	< 4.0	< 4.0	-
Iron	ug/L	25558	< 200	< 200	< 200	-
Lead	ug/L	0.038	< 3	< 3.0	< 3.0	-
Lithium	ug/L	40 (p)	-	-	-	-
Manganese	ug/L	1694	66	63	< 50	-
Mercury	ng/L	1	1.93	< 1.00	< 1.00	-
Molybdenum	ug/L	200 (p)	-	-	-	-
Nickel	ug/L	80 (p)	25	28	33	-
Selenium	ug/L	20 (p)	-	-	-	-
Silver	ug/L	0.8 (p)	-	-	-	-
Thallium	ug/L	8.0 (p)	-	-	-	-
Vanadium	ug/L	16 (p)	-	-	-	-
Zinc	ug/L	25	15	16	40	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	137	50	30	23	-
Alkalinity, Carbonate	mg/L	2	< 2	< 2.0	< 2.0	-
Chloride	mg/L	711	14	77	17	-
Fluoride	mg/L	4.0 (p)	< 1	< 1.0	< 1.0	-
Nitrogen, Ammonia	mg/L	0.36	< .025	< .025	< .025	-
Nitrogen, Nitrate	mg/L	1	2.2	2.7	0.53	-
Nitrogen, Nitrite	mg/L	0.07	< .1	< .1	< .1	-
Sulfate	mg/L	343	200	180	65	-
Sulfide	mg/L	1	< 0.2	< 0.20	< 0.20	-
Major Cations						
Calcium	mg/L	123	62	78	23	-
Magnesium	mg/L	48	25	30	8.8	-
Potassium	mg/L	8	3.5	3.6	2.0	-
Sodium	mg/L	289	15	15	7.2	-
General						
Hardness	mg/L	510	256	300	103	-

2017
Mine Permit Groundwater Quality Monitoring Data
MER-001 (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		11.7	7.87	
ORP	mV	-		97.1	192.5	
pH	SU	6.1-7.1		6.65	5.96	
Specific Conductance	uS/cm	-		37.8	68	
Temperature	C	-		0.41	11.051	
Turbidity	NTU	-		7.3	1.76	
Flow	cfs	-		NM	NM	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	0.73	-	-	-	-
Arsenic	ug/L	3.4	< 1	< 1.0	< 1.0	-
Barium	ug/L	12	-	-	-	-
Beryllium	ug/L	0.73	-	-	-	-
Boron	ug/L	14.8	-	-	-	-
Cadmium	ug/L	0.1	-	-	-	-
Chromium	ug/L	1.2	-	-	-	-
Cobalt	ug/L	0.42	-	-	-	-
Copper	ug/L	0.86	0.54	0.55	0.70	-
Iron	ug/L	3255	1100	1700	920	-
Lead	ug/L	0.351	0.155	0.174	0.167	-
Lithium	ug/L	5.7	-	-	-	-
Manganese	ug/L	226	55	130	61	-
Mercury	ng/L	8.5	4.18	4.48	5.09	-
Molybdenum	ug/L	1	-	-	-	-
Nickel	ug/L	1	0.46	0.62	0.71	-
Selenium	ug/L	0.19	-	-	-	-
Silver	ug/L	0.12	-	-	-	-
Thallium	ug/L	0.75	-	-	-	-
Vanadium	ug/L	1.5	-	-	-	-
Zinc	ug/L	2.6	18.1	2.38	2.40	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	50	16	21	15	-
Alkalinity, Carbonate	mg/L	2	< 2	< 2.0	< 2.0	-
Chloride	mg/L	13	7.8	4.2	5.7	-
Fluoride	mg/L	0.19	< 0.1	< 0.10	< 0.10	-
Nitrogen, Ammonia	mg/L	2.0 (P)	< 0.5	< 0.50	< 0.50	-
Nitrogen, Nitrate	mg/L	0.34	< 0.5	< 0.50	< 0.50	-
Nitrogen, Nitrite	mg/L	0.36	< 0.5	< 0.50	< 0.50	-
Sulfate	mg/L	10	< 1	< 1.0	< 1.0	-
Sulfide	mg/L	3.2	< 5	< 5.0	< 5.0	-
Major Cations						
Calcium	mg/L	15	5.9	6.6	5.3	-
Magnesium	mg/L	4.1	1.9	2	1.5	-
Potassium	mg/L	1	0.95	0.68	0.54	-
Sodium	mg/L	6.9	3.8	2.5	3.2	-
General						
Hardness	mg/L	56	22	36	22	-
Total Dissolved Solids	mg/L	111	140	82	86.0	-
Total Suspended Solids	mg/L	4	< 3.3	-	4.3	-

2017
Mine Permit Groundwater Quality Monitoring Data
MER-002 (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		11.3	7.42	
ORP	mV	-		38.4	131.8	
pH	SU	6.0-7.0		7.11	6.37	
Specific Conductance	uS/cm	-		56.7	73.7	
Temperature	C	-		0.29	11.54	
Turbidity	NTU	-		8.28	1.75	
Flow	cfs	-		55	NM	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	0.72	-	-	-	-
Arsenic	ug/L	5.1	1.1	1.4	< 1.0	-
Barium	ug/L	20	-	-	-	-
Beryllium	ug/L	0.73	-	-	-	-
Boron	ug/L	13.5	-	-	-	-
Cadmium	ug/L	0.09	-	-	-	-
Chromium	ug/L	1.2	-	-	-	-
Cobalt	ug/L	0.65	-	-	-	-
Copper	ug/L	0.9	0.5	0.49	0.67	-
Iron	ug/L	6440	1600	2400	1300	-
Lead	ug/L	0.374	0.154	0.146	0.161	-
Lithium	ug/L	5.7	-	-	-	-
Manganese	ug/L	560	90	180	91	-
Mercury	ng/L	7.5	3.99	3.96	4.75	-
Molybdenum	ug/L	0.729	-	-	-	-
Nickel	ug/L	1.2	0.57	0.95	0.73	-
Selenium	ug/L	0.19	-	-	-	-
Silver	ug/L	0.12	-	-	-	-
Thallium	ug/L	0.73	-	-	-	-
Vanadium	ug/L	3	-	-	-	-
Zinc	ug/L	3	2.17	1.97	2.30	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	53	15	24	17	-
Alkalinity, Carbonate	mg/L	2	< 2	< 2.0	< 2.0	-
Chloride	mg/L	16	6.8	7.2	5.9	-
Fluoride	mg/L	0.19	< 0.1	< 0.10	< 0.10	-
Nitrogen, Ammonia	mg/L	2.0 (P)	< 0.5	< 0.50	< 0.50	-
Nitrogen, Nitrate	mg/L	0.404	< 0.5	< 0.50	< 0.50	-
Nitrogen, Nitrite	mg/L	0.365	< 0.5	< 0.50	< 0.50	-
Sulfate	mg/L	13.9	< 1	7.9	< 1.0	-
Sulfide	mg/L	3.2	< 5	< 5.0	< 5.0	-
Major Cations						
Calcium	mg/L	18	6.5	9	5.5	-
Magnesium	mg/L	4.9	2	2.7	1.7	-
Potassium	mg/L	1.2	1	0.95	0.51	-
Sodium	mg/L	9.4	3.7	4.4	3.6	-
General						
Hardness	mg/L	67	24	36	22	-
Total Dissolved Solids	mg/L	125	90	60	78.0	-
Total Suspended Solids	mg/L	12	< 3.3	-	4.3	-

2017
Mine Permit Groundwater Quality Monitoring Data
MER-003 (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		11.4	7.64	
ORP	mV	-		37.9	154.5	
pH	SU	6.0-7.0		7.23	6.8	
Specific Conductance	uS/cm	-		58.8	85.2	
Temperature	C	-		0.28	11.76	
Turbidity	NTU	-		9.8	2.3	
Flow	cfs	-		NM	NM	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	0.7	-	-	-	-
Arsenic	ug/L	3.3	2.1	1.5	1.2	-
Barium	ug/L	15	-	-	-	-
Beryllium	ug/L	0.73	-	-	-	-
Boron	ug/L	15	-	-	-	-
Cadmium	ug/L	0.09	-	-	-	-
Chromium	ug/L	0.85	-	-	-	-
Cobalt	ug/L	0.65	-	-	-	-
Copper	ug/L	0.92	0.51	0.51	0.73	-
Iron	ug/L	4268	2900	2500	1500	-
Lead	ug/L	0.35	0.198	0.163	0.190	-
Lithium	ug/L	5.69	-	-	-	-
Manganese	ug/L	280	140	200	110	-
Mercury	ng/L	7.6	6.22	4.02	4.71	-
Molybdenum	ug/L	0.8	-	-	-	-
Nickel	ug/L	1.3	0.68	1.21	0.89	-
Selenium	ug/L	0.2	-	-	-	-
Silver	ug/L	0.12	-	-	-	-
Thallium	ug/L	0.7	-	-	-	-
Vanadium	ug/L	1.2	-	-	-	-
Zinc	ug/L	2.9	2.72	2.16	2.45	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	56	19	25	18	-
Alkalinity, Carbonate	mg/L	2	< 2	< 2.0	< 2.0	-
Chloride	mg/L	19	8.6	8.1	7.3	-
Fluoride	mg/L	0.29	< 0.1	< 0.10	0.37	-
Nitrogen, Ammonia	mg/L	2.0 (P)	< 0.5	< 0.50	< 0.50	-
Nitrogen, Nitrate	mg/L	0.343	< 0.5	< 0.50	< 0.50	-
Nitrogen, Nitrite	mg/L	0.365	< 0.5	< 0.50	< 0.50	-
Sulfate	mg/L	16	< 1	9.1	< 1.0	-
Sulfide	mg/L	3.2	< 5	< 5.0	< 5.0	-
Major Cations						
Calcium	mg/L	19	7.2	9	5.9	-
Magnesium	mg/L	5.3	2.3	2.8	1.9	-
Potassium	mg/L	1.4	1.2	1	0.57	-
Sodium	mg/L	11	4.9	4.8	5.0	-
General						
Hardness	mg/L	71	28	36	22	-
Total Dissolved Solids	mg/L	141	100	68	54.0	-
Total Suspended Solids	mg/L	3.1	12.3	-	5.2	-

2017
Mine Permit Groundwater Quality Monitoring Data
WBR-001 (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		9.66	6.58	
ORP	mV	-		195.7	211.5	
pH	SU	5.0-6.0		5.27	5.05	
Specific Conductance	uS/cm	-		35	71.9	
Temperature	C	-		0.12	11.07	
Turbidity	NTU	-		4.16	0.3	
Flow	cfs	-		0.169	NM	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	0.7	-	-	-	-
Arsenic	ug/L	8.7	< 1	1.1	< 1.0	-
Barium	ug/L	26	-	-	-	-
Beryllium	ug/L	0.73	-	-	-	-
Boron	ug/L	12.7	-	-	-	-
Cadmium	ug/L	0.059	-	-	-	-
Chromium	ug/L	2.7	-	-	-	-
Cobalt	ug/L	0.85	-	-	-	-
Copper	ug/L	1	0.53	0.77	0.83	-
Iron	ug/L	11056	1400	1300	1000	-
Lead	ug/L	1.8	0.779	0.797	0.746	-
Lithium	ug/L	8.6	-	-	-	-
Manganese	ug/L	641	65	97	45	-
Mercury	ng/L	17	7.72	8.33	9.54	-
Molybdenum	ug/L	8.1	-	-	-	-
Nickel	ug/L	1.9	0.68	0.71	0.67	-
Selenium	ug/L	0.325	-	-	-	-
Silver	ug/L	0.122	-	-	-	-
Thallium	ug/L	0.7	-	-	-	-
Vanadium	ug/L	4.2	-	-	-	-
Zinc	ug/L	9.2	5.39	5.48	5.28	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	15	3	5.1	3.8	-
Alkalinity, Carbonate	mg/L	2	< 2	< 2.0	< 2.0	-
Chloride	mg/L	24	16	10	13	-
Fluoride	mg/L	0.26	< 0.1	< 0.10	< 0.10	-
Nitrogen, Ammonia	mg/L	0.78	< 0.5	< 0.50	< 0.50	-
Nitrogen, Nitrate	mg/L	0.342	< 0.5	< 0.50	< 0.50	-
Nitrogen, Nitrite	mg/L	0.365	< 0.5	< 0.50	< 0.50	-
Sulfate	mg/L	9.3	< 1	< 120	< 25	-
Sulfide	mg/L	3.2	< 5	< 5.0	< 5.0	-
Major Cations						
Calcium	mg/L	8.3	3.9	3.5	2.9	-
Magnesium	mg/L	3.3	1.7	1.4	1.1	-
Potassium	mg/L	2.6	1.1	0.91	0.69	-
Sodium	mg/L	11	7.1	4.7	6.5	-
General						
Hardness	mg/L	38	20	16	16	-
Total Dissolved Solids	mg/L	204	105	60	167	-
Total Suspended Solids	mg/L	34	< 3.3	-	< 3.3	-

2017
Mine Permit Groundwater Quality Monitoring Data
WBR-002 (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		1.6	8.59	
ORP	mV	-		116.4	133.6	
pH	SU	6.3-7.3		6.2	6.58	
Specific Conductance	uS/cm	-		141.2	167	
Temperature	C	-		1.34	13.09	
Turbidity	NTU	-		22.2	12.57	
Flow	cfs	-		NM		
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	0.72	-	-	-	-
Arsenic	ug/L	10	2.3	3.5	1.4	-
Barium	ug/L	19	-	-	-	-
Beryllium	ug/L	0.73	-	-	-	-
Boron	ug/L	18	-	-	-	-
Cadmium	ug/L	0.09	-	-	-	-
Chromium	ug/L	10	-	-	-	-
Cobalt	ug/L	0.8	-	-	-	-
Copper	ug/L	1.34	1.26	1.18	1.44	-
Iron	ug/L	15593	3300	7300	2300	-
Lead	ug/L	0.252	0.314	0.293	0.255	-
Lithium	ug/L	5.6	-	-	-	-
Manganese	ug/L	1295	120	890	95	-
Mercury	ng/L	4.3	2.22	2.68	2.78	-
Molybdenum	ug/L	2.8	-	-	-	-
Nickel	ug/L	1.9	1.95	2.67	1.85	-
Selenium	ug/L	0.176	-	-	-	-
Silver	ug/L	0.122	-	-	-	-
Thallium	ug/L	0.72	-	-	-	-
Vanadium	ug/L	0.83	-	-	-	-
Zinc	ug/L	4.5	2.94	2.86	1.66	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	41	19	98	13	-
Alkalinity, Carbonate	mg/L	2	< 2	< 2.0	< 2.0	-
Chloride	mg/L	56	41	48	32	-
Fluoride	mg/L	0.31	< 0.1	< 0.10	< 0.10	-
Nitrogen, Ammonia	mg/L	0.61	< 0.5	< 0.50	< 0.50	-
Nitrogen, Nitrate	mg/L	0.36	< 0.5	< 0.50	< 0.50	-
Nitrogen, Nitrite	mg/L	0.365	< 0.5	< 0.50	< 0.50	-
Sulfate	mg/L	10.1	< 1	< 1.0	< 1.0	-
Sulfide	mg/L	3.2	< 5	< 5.0	< 5.0	-
Major Cations						
Calcium	mg/L	13	7.7	10	4.7	-
Magnesium	mg/L	5.8	3.8	4.9	2.2	-
Potassium	mg/L	2.7	1.7	1.9	1.3	-
Sodium	mg/L	28	22	24	16	-
General						
Hardness	mg/L	56	32	40	22	-
Total Dissolved Solids	mg/L	182	76	126	198	-
Total Suspended Solids	mg/L	9.8	4.7	-	6.9	-

2017
Mine Permit Groundwater Quality Monitoring Data
WBR-003 (Monitoring)

Parameter	Unit	Recommended Benchmark 2014	Q4 2016	Q1 2017	Q2 2017	Q3 2017
Field						
D.O.	ppm	-		5.13	3.73	
ORP	mV	-		21.5	117.2	
pH	SU	6.1-7.1		6.68	6.2	
Specific Conductance	uS/m	-		101.8	134.8	
Temperature	C	-		0.18	10.86	
Turbidity	NTU	-		18.8	6.64	
Flow	cfs	-		NM	NM	
Metals						
Aluminum	ug/L	200 (p)	-	-	-	-
Antimony	ug/L	0.7	-	-	-	-
Arsenic	ug/L	4.4	1.3	2.8	1.4	-
Barium	ug/L	19	-	-	-	-
Beryllium	ug/L	0.7	-	-	-	-
Boron	ug/L	19.1	-	-	-	-
Cadmium	ug/L	0.09	-	-	-	-
Chromium	ug/L	0.74	-	-	-	-
Cobalt	ug/L	1.2	-	-	-	-
Copper	ug/L	1	0.25	0.54	0.67	-
Iron	ug/L	11315	2600	9300	3100	-
Lead	ug/L	0.44	0.121	0.169	0.165	-
Lithium	ug/L	5.53	-	-	-	-
Manganese	ug/L	2101	60	790	130	-
Mercury	ng/L	6	1.91	2.76	2.93	-
Molybdenum	ug/L	1.9	-	-	-	-
Nickel	ug/L	1.8	0.59	1.36	1.05	-
Selenium	ug/L	0.19	-	-	-	-
Silver	ug/L	0.12	-	-	-	-
Thallium	ug/L	0.72	-	-	-	-
Vanadium	ug/L	0.82	-	-	-	-
Zinc	ug/L	10	2.15	3.28	1.94	-
Major Anions						
Alkalinity, Bicarbonate	mg/L	56	16	28	17	-
Alkalinity, Carbonate	mg/L	2	< 2	< 2.0	< 2.0	-
Chloride	mg/L	43	23	31	20	-
Fluoride	mg/L	0.34	0.1	< 0.10	< 0.10	-
Nitrogen, Ammonia	mg/L	2.0 (P)	< 0.5	< 0.50	< 0.50	-
Nitrogen, Nitrate	mg/L	0.303	< 0.5	< 0.50	< 0.50	-
Nitrogen, Nitrite	mg/L	0.365	< 0.5	< 0.50	< 0.50	-
Sulfate	mg/L	13.8	< 1	< 1.0	< 1.0	-
Sulfide	mg/L	3.17	< 5	< 5.0	< 5.0	-
Major Cations						
Calcium	mg/L	16	7	9	5.3	-
Magnesium	mg/L	6.6	3.5	4.1	2.6	-
Potassium	mg/L	2	1.8	1.9	1.2	-
Sodium	mg/L	21	15	15	12	-
General						
Hardness	mg/L	69	30	40	24	-
Total Dissolved Solids	mg/L	184	85	144	104	-
Total Suspended Solids	mg/L	15.4	< 3.3	-	5.0	-

2017
Mine Permit Groundwater Quality Monitoring Data Abbreviations & Data Qualifiers
Humboldt Mill

Explanations of abbreviations are included on the final page of this table.

Abbreviations & Data Qualifiers

Notes:
Benchmarks are calculated based on guidance from Eagles Mine's Development of Site Specific Benchmarks for Mine Permit Water Quality Monitoring.
Results in bold text indicate that the parameter was detected at a level greater than the laboratory reporting limit.
Highlighted Cell = Value is equal to or above site-specific benchmark. An exceedance occurs if there are 2 consecutive sampling events with a value equal to or greater than the benchmark at a compliance monitoring location.
(p) = Due to less than two detections in baseline dataset, benchmark defaulted to four times the reporting limit.
--Denotes no benchmark required or parameter was not required to be collected during the sampling quarter.
NM = Not measured during the sampling event.