

Appendix 20

Meadowbank Predicted Water Quantity and Quality (2012-2022)

Predicted water quantity and quality compared to the measured water quantity and quality

Predicted Model Year used for Comparison against Current Life of Mine Calendar Year

Calendar Year	Current Life of Mine Year	Predicted Model Year Used for Comparison				
		Third Portage Open Pit (Pit E)	North Portage Pit Sump (Pit A)	Goose Island Pit	Vault Pit Sump	Phaser Pit Sump
2012	3	3	not in operation	3	not in operation	not in operation
2013	4	4		3		
2014	5	4	4	3	5	
2015	6	4	4	3	6	
2016	7	4	4	3	7	
2017	8	4	4	3	7	
2018	9	4	4	3	7	7
2019	10	4**	4**	3**	8	8
2020	11	4**	4**	3**	9	9
2021	12	4**	4**	3**	10	10
2022	13	4**	4**	3**	11	11
2023	14	4**	4**	3**	12	12
2024	15	4**	4**	3**	13	13
2025	16	4**	4**	3**	13	13
2026	17	4**	4**	3**	13	13
2027-2038	Closure	5 to 13	5 to 13	5 to 13	13	13

Note:

** As of 2019, measured data are compared against the predicted model year presented in 2007 and the predicted values presented in the Meadowbank Interim Closure and Reclamation Plan, updated in 2019 which include in-pit deposition.

2012 Predicted water quantity and quality compared to the measured water quantity and quality
LIFE OF MINE YEAR 3

Water Quantity^a

Pits	Predicted (m ³)	Measured (m ³)	% Difference between predicted vs measured	Predicted Model Year
Portage	931 800	1 026 000	10	3
Bay Goose	1 235 100	499 000	-60	3

^apredicted volumes from Golder 2007 - Waste and Water Management Plan - Meadowbank Gold Project

Third Portage Open Pit Sumps Water Quality Predicted Model Year 3

Parameters	Units	Probable Scenario Predicted Model Year 3*	Possible Poor end Scenario Predicted Model Year 3*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile *		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to 3PL**
				Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor			
pH		6.30	6.10	7.90	7.77	24	28	23	27	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	39	42	92	56	136	119	44	33	--	--	--
Ammonia (unionized)	mg NH3/L	0.00057	0.0006	0.2081	0.1000	36 413	34 588	17 444	16 567	0.016	--	--
Ammonia nitrogen	mg N/L	2.3	4	3.9	0.2	69	0	-90	-94	1.83	--	16
Dissolved Arsenic	mg/L	0.0024	0.057	0.0031	0.0025	29	-95	4	-96	0.005	0.5	0.3
Chloride	mg/L	630	630	20	7	-97	-97	-99	-99	120	--	1000
Dissolved Copper	mg/L	0.0014	0.013	0.0046	0.0025	230	-64	79	-81	0.002	0.3	0.1
Fluoride	mg/L	0.19	0.23	0.028	0.34	228	171	80	49	0.12	--	--
Hardness	mg CaCO3/L	300	310	100	78	-67	-68	-74	-75	--	--	--
Dissolved Lead	mg/L	0.0016	0.0063	0.0036	0.0025	123	-43	56	-60	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.003	0.073	0.0051	0.0025	75	-93	-14	-97	0.025	0.5	0.2
Dissolved Barium	mg/L	0.040	0.057	0.0651	0.0088	63	14	-78	-85	--	--	--
Dissolved Cadmium	mg/L	0.000074	0.00023	0.0025	0.0025	3 278	987	3 278	987	0.00004	--	0.002
Dissolved Iron	mg/L	0.36	3.7	0.0328	0.0250	-91	-99	-93	-99	0.3	--	--
Dissolved Mercury	mg/L	0.0000057	0.000044	0.00025	0.00025	4 286	468	4 286	468	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.19	0.55	0.0553	0.0335	-71	-90	-82	-94	0.23	--	--
Dissolved Molybdenum	mg/L	0.013	0.013	0.0238	0.0193	83	83	48	48	0.073	--	--
Dissolved Selenium	mg/L	0.0003	0.0011	0.0025	0.0025	762	127	762	127	0.001	--	--
Dissolved Thallium	mg/L	0.00003	0.0001	0.0044	0.0050	14 692	4 338	16 567	4 900	0.0008	--	--
Nitrate	mgN/L	2.60	4.4	7.74	2.96	198	76	14	-33	2.94	--	20
Sulphate	mg/L	31	42	40	19	28	-6	-39	-55	128	--	--
Total dissolved solids	mg/L	960	990	240	168	-75	-76	-83	-83	--	--	--
Dissolved Zinc	mg/L	0.0074	0.068	0.0179	0.0025	142	-74	-66	-96	0.013	0.5	0.4

Goose Island Open Pit Sumps Water Quality Predicted Model Year 3

Parameters	Units	Probable Scenario Predicted Model Year 3*	Possible Poor end Scenario Predicted Model Year 3*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile *		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to 3PL**
				Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor			
pH		6.10	6.10	7.75	7.56	27	27	24	24	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	27	27	85	55	216	216	103	103	--	--	--
Ammonia (unionized)	mg NH3/L	0.00056	0.00056	0.2358	0.0250	42 013	42 013	4 364	4 364	0.016	--	--
Ammonia nitrogen	mg N/L	3.6	3.6	5.0	0.6	40	40	-83	-83	1.83	--	16
Dissolved Arsenic	mg/L	0.0016	0.0016	0.0158	0.0073	884	884	353	353	0.005	0.5	0.3
Chloride	mg/L	440	440	16	6	-96	-96	-99	-99	120	--	1000
Dissolved Copper	mg/L	0.00010	0.001	0.0150	0.0088	15 689	1 479	9 111	821	0.002	0.3	0.1
Fluoride	mg/L	0.13	0.13	0.43	0.24	231	231	83	83	0.12	--	--
Hardness	mg CaCO3/L	210	210	130	60	-38	-38	-72	-72	--	--	--
Dissolved Lead	mg/L	0.0011	0.0011	0.0144	0.0044	1 207	1 207	298	298	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.002	0.002	0.0194	0.0194	869	869	869	869	0.025	0.5	0.2
Dissolved Barium	mg/L	0.027	0.0270	0.0618	0.0305	129	129	13	13	--	--	--
Dissolved Cadmium	mg/L	0.000051	0.000051	0.0250	0.0250	48 920	48 920	48 920	48 920	0.00004	--	0.002
Dissolved Iron	mg/L	0.25	0.25	0.0250	0.0250	-90	-90	-90	-90	0.3	--	--
Dissolved Mercury	mg/L	0.0000039	0.0000039	0.00644	0.00025	164 964	164 964	6 310	6 310	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.13	0.13	0.1479	0.1109	14	14	-15	-15	0.23	--	--
Dissolved Molybdenum	mg/L	0.0086	0.0086	0.0240	0.0240	179	179	179	179	0.073	--	--
Dissolved Selenium	mg/L	0.0002	0.0002	0.0138	0.0025	6 775	6 775	1 150	1 150	0.001	--	--
Dissolved Thallium	mg/L	0.00002	0.00002	0.0050	0.0050	24 900	24 900	24 900	24 900	0.0008	--	--
Nitrate	mgN/L	4.00	4.00	6.28	0.92	57	57	-77	-77	2.94	--	20
Sulphate	mg/L	21	21	27	17	30	30	-20	-20	128	--	--
Total dissolved solids	mg/L	670	670	258	167	-61	-61	-75	-75	--	--	--
Dissolved Zinc	mg/L	0.0051	0.0051	0.0170	0.0025	233	233	-51	-51	0.013	0.5	0.4

Footnotes:

Highlighted values represent exceedances of greater than 20% relative percent difference between predicted vs measured values.

* Used year 3 predictions for Portage and year 3 for Goose presented in Golder, 2007 - Water Quality Predictions Meadowbank Gold Project Doc No 516. Ver 0

** Discharge criteria and guidelines based on total metal concentrations. Sulphate guideline based on threshold value from BC Environment guideline for the protection of aquatic life for very soft water (0-30 mg/L) (April 2013).

Highlighted values in yellow indicate a mean measured value greater than the discharge criteria or guidelines.

**2013 Comparison of predicted pit water quantity and quality to the measured water quantity and quality
LIFE OF MINE YEAR 4**

Water Quantity^A

Pits ^{**}	Predicted (m ³)	Measured (m ³)	% Difference between predicted vs measured	Predicted Model Year
Portage	931 800	676 706	-27	3
Bay Goose	1 235 100	344 994	-72	3

^Apredicted volumes from Golder 2007 - Waste and Water Management Plan - Meadowbank Gold Project
^{**}There is no year 4 in the predicted model so take year 3 for Portage and Vault and year 3 for Goose.

Third Portage Open Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 4*	Possible Poor end Scenario Predicted Model Year 4*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile *		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to 3PL**
				Mean	Lower 25th centile +	Probable	Possible Poor	Probable	Possible Poor			
						Probable	Possible Poor	Long Term, Based on 3PL quality	Max. Monthly Mean			
pH		6.30	6.10	7.49	7.17	19	23	14	18	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	40	43	72	52	81	68	30	21	--	--	--
Ammonia (unionized)	mg N/L	0.00052	0.00055	0.2000	0.0250	38 362	36 264	4 708	4 445	0.016	--	--
Ammonia nitrogen	mg N/L	2.1	3.5	3.6	0.2	70	2	-91	-95	1.83	--	16
Dissolved Arsenic	mg/L	0.0024	0.068	0.0180	-	650	-74			0.005	0.5	0.3
Chloride	mg/L	620	630	2	-	-100	-100			120	--	1000
Dissolved Copper	mg/L	0.0014	0.016	0.0124	-	788	-22			0.002	0.3	0.1
Fluoride	mg/L	0.19	0.24	0.13	-	-32	-46			0.12	--	--
Hardness	mg CaCO3/L	300	310	48	-	-84	-85			--	--	--
Dissolved Lead	mg/L	0.0016	0.0076	0.0010	-	-36	-87			0.001	0.2	0.1
Dissolved Nickel	mg/L	0.003	0.093	0.0047	-	-88	-95			0.025	0.5	0.2
Dissolved Barium	mg/L	0.041	0.063	0.0076	-	-82	-88			--	--	--
Dissolved Cadmium	mg/L	0.000076	0.00027	0.0000	-	-87	-96			0.00004	--	0.002
Dissolved Iron	mg/L	0.37	4.6	0.1025	-	-97	-100			0.3	--	--
Dissolved Mercury	mg/L	0.000059	0.000054	0.00005	-	747	-7			0.000026	--	0.0004
Dissolved Manganese	mg/L	0.19	0.66	0.0123	-	-94	-98			0.23	--	--
Dissolved Molybdenum	mg/L	0.013	0.013	0.0016	-	-88	-88			0.073	--	--
Dissolved Selenium	mg/L	0.0003	0.0012	0.0005	-	72	-58			0.001	--	--
Dissolved Thallium	mg/L	0.00003	0.00012	0.0025	-	7 965	1 983			0.0008	--	--
Nitrate	mg/NL	2.30	4.0	1.35	-	-41	-66			2.94	--	20
Sulphate	mg/L	31	46	83	-	167	80			128	--	--
Total dissolved solids	mg/L	960	990	127	57	-87	-87	-94	-94	--	--	--
Dissolved Zinc	mg/L	0.0076	0.085	0.0028	-	-64	-97			0.013	0.5	0.4

Goose Island Open Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 3*	Possible Poor end Scenario Predicted Model Year 3*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile *		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to 3PL**
				Mean	Lower 25th centile +	Probable	Possible Poor	Probable	Possible Poor			
						Probable	Possible Poor	Long Term, Based on 3PL quality	Max. Monthly Mean			
pH		6.10	6.10	7.68	7.49	26	26	23	23	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	27	27	130	109	380	380	304	304	--	--	--
Ammonia (unionized)	mg N/L	0.00056	0.00056	0.2961	0.1400	52 777	52 777	24 900	24 900	0.016	--	--
Ammonia nitrogen	mg N/L	5.4	5	7.9	4.0	46	46	-26	-26	1.83	--	16
Dissolved Arsenic	mg/L	0.0016	0.0016	0.0046	-	188	188			0.005	0.5	0.3
Chloride	mg/L	440	440	62	-	-86	-86			120	--	1000
Dissolved Copper	mg/L	0.001	0.001	0.0712	-	7 389	7 389			0.002	0.3	0.1
Fluoride	mg/L	0.13	0.13	0.72	-	454	454			0.12	--	--
Hardness	mg CaCO3/L	210	210	214	-	2	2			--	--	--
Dissolved Lead	mg/L	0.0011	0.0011	0.0002	-	-86	-86			0.001	0.2	0.1
Dissolved Nickel	mg/L	0.002	0.002	0.0599	-	2 893	2 893			0.025	0.5	0.2
Dissolved Barium	mg/L	0.027	0.0270	0.1328	-	392	392			--	--	--
Dissolved Cadmium	mg/L	0.000051	0.000051	0.0000	-	-12	-12			0.00004	--	0.002
Dissolved Iron	mg/L	0.25	0.25	0.1025	-	-59	-59			0.3	--	--
Dissolved Mercury	mg/L	0.000039	0.000039	0.00008	-	1 823	1 823			0.000026	--	0.0004
Dissolved Manganese	mg/L	0.13	0.13	0.2192	-	69	69			0.23	--	--
Dissolved Molybdenum	mg/L	0.0086	0.0086	0.0207	-	140	140			0.073	--	--
Dissolved Selenium	mg/L	0.0002	0.0002	0.0015	-	650	650			0.001	--	--
Dissolved Thallium	mg/L	0.00002	0.00002	0.0025	-	12 400	12 400			0.0008	--	--
Nitrate	mg/NL	4.00	4.00	20.80	-	420	420			2.94	--	20
Sulphate	mg/L	21	21	66	-	216	216			128	--	--
Total dissolved solids	mg/L	670	670	314	218	-53	-53	-68	-68	--	--	--
Dissolved Zinc	mg/L	0.0051	0.0051	0.0075	-	47	47			0.013	0.5	0.4

Footnotes:

Highlighted values represent exceedences of greater than 20% relative percent difference between predicted vs measured values.

* Used year 4 predictions for Portage and year 3 for Goose presented in Golder, 2007 - Water Quality Predictions Meadowbank Gold Project Doc No 516. Ver 0

+ Some have no lower 25th percentile data as only 2 or 1 samples were monitored in 2013

** Discharge criteria and guidelines based on total metal concentrations. Sulphate guideline based on threshold value from BC Environment guideline for the protection of aquatic life for very soft water (0-30 mg/L) (April 2013).

Highlighted values in yellow indicate a mean measured value greater than the discharge criteria or guidelines.

**2014 Comparison of predicted pit water quantity and quality to the measured water quantity and quality
LIFE OF MINE YEAR 5**

Water Quantity^A

Pits**	Predicted (m ³)	Measured (m ³)	% Difference between predicted vs measured	Predicted Model Year
Portage	715 200	165 877	-77	5
Bay Goose	1 235 100	307 769	-75	3
Vault Pit	46 100	101 617	120	5

^A Predicted volumes from Golder 2007 - Waste and Water Management Plan - Meadowbank Gold Project, Table 12.1 and Figures 12.7

**There is no year 5 in the predicted model for Bay Goose so take year 3 for Goose.

Vault Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 5*	Possible Poor end Scenario Predicted Model Year 5*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to Wally Lake**
				Mean	Lower 25th centile*	Probable	Possible Poor	Probable	Possible Poor			
pH		8.00	8.00	7.13	-	-11	-11	-	-	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO ₃ /L	0.091	9.7	89	-	97 153	812	-	-	-	--	--
Ammonia (unionized)	mg N/L	0.78	1.30	0.1800	-	-77	-86	-	-	0.016	--	--
Ammonia nitrogen	mg N/L	64	110	14.4	-	-78	-87	-	-	1.83	--	20
Dissolved Arsenic	mg/L	0.000063	0.052	0.0127	-	20 059	-76	-	-	0.005	0.5	0.1
Chloride	mg/L	0.0031	0.033	31	-	996 674	93 536	-	-	120	--	500
Dissolved Copper	mg/L	0.000063	0.00075	0.0116	-	184 027	1 447	-	-	0.002	0.3	0.1
Fluoride	mg/L	0.000063	0.013	0.26	-	4 126 884	1 900	-	-	0.12	--	--
Hardness	mg CaCO ₃ /L	0.11	19	378	-	343 536	1 889	-	-	--	--	--
Dissolved Lead	mg/L	0.00000081	0.000011	0.0002	-	18 419	1 264	-	-	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.000012	0.00011	0.0254	-	211 567	22 991	-	-	0.025	0.5	0.2
Dissolved Barium	mg/L	0.000210	0.012	0.0588	-	27 900	390	-	-	--	--	--
Dissolved Cadmium	mg/L	0.00000081	0.000011	0.0003	-	370 270	2 627	-	-	0.00004	--	0.002
Dissolved Iron	mg/L	0.000063	0.002	0.2200	-	349 106	10 900	-	-	0.3	--	--
Dissolved Mercury	mg/L	0.00000081	0.000011	0.00010	-	123 357	809	-	-	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.000018	0.00230	0.1328	-	737 678	5 674	-	-	0.23	--	--
Dissolved Molybdenum	mg/L	0.000160	0.03100	0.1089	-	67 963	251	-	-	0.073	--	--
Dissolved Selenium	mg/L	0.0000041	0.00055	0.0070	-	170 632	1 173	-	-	0.001	--	--
Dissolved Thallium	mg/L	0.0000021	0.000023	0.0025	-	118 948	10 770	-	-	0.0008	--	--
Nitrate	mg/L	71	120	46.40	-	-35	-61	-	-	2.94	--	50
Sulphate	mg/L	0.01	10	148	-	1 479 900	1 380	-	-	128	--	--
Total dissolved solids	mg/L	150	300	456	-	204	52	-	-	--	--	--
Dissolved Zinc	mg/L	0.000041	0.00052	0.0020	-	4 778	285	-	-	0.013	0.5	0.2

Goose Island Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 3*	Possible Poor end Scenario Predicted Model Year 3*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile *		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to 3PL**
				Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor			
pH		6.10	6.10	7.97	7.52	31	31	23	23	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO ₃ /L	27	27	90	86	233	233	217	217	--	--	--
Ammonia (unionized)	mg N/L	0.00056	0.00056	0.0600	0.0100	10 614	10 614	1 686	1 686	0.016	--	--
Ammonia nitrogen	mg N/L	5.4	5	1.8	0.2	-66	-66	-96	-96	1.83	--	16
Dissolved Arsenic	mg/L	0.0016	0.0016	0.0040	-	150	150	-	-	0.005	0.5	0.3
Chloride	mg/L	440	440	53	-	-88	-88	-	-	120	--	1000
Dissolved Copper	mg/L	0.001	0.001	0.0010	-	5	5	-	-	0.002	0.3	0.1
Fluoride	mg/L	0.13	0.13	0.94	-	623	623	-	-	0.12	--	--
Hardness	mg CaCO ₃ /L	210	210	131	-	-38	-38	-	-	--	--	--
Dissolved Lead	mg/L	0.0011	0.0011	0.0002	-	-82	-82	-	-	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.002	0.002	0.0150	-	650	650	-	-	0.025	0.5	0.2
Dissolved Barium	mg/L	0.027	0.0270	0.0280	-	4	4	-	-	--	--	--
Dissolved Cadmium	mg/L	0.000051	0.000051	0.0000	-	-80	-80	-	-	0.00004	--	0.002
Dissolved Iron	mg/L	0.25	0.25	0.0050	-	-98	-98	-	-	0.3	--	--
Dissolved Mercury	mg/L	0.0000039	0.0000039	0.00010	-	2 464	2 464	-	-	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.13	0.13	0.0590	-	-55	-55	-	-	0.23	--	--
Dissolved Molybdenum	mg/L	0.0086	0.0086	0.0180	-	109	109	-	-	0.073	--	--
Dissolved Selenium	mg/L	0.0002	0.0002	0.0010	-	400	400	-	-	0.001	--	--
Dissolved Thallium	mg/L	0.00002	0.00002	0.0030	-	14 900	14 900	-	-	0.0008	--	--
Nitrate	mg/L	4.00	4.00	10.90	-	173	173	-	-	2.94	--	20
Sulphate	mg/L	21	21	61	-	190	190	-	-	128	--	--
Total dissolved solids	mg/L	670	670	530	232	-21	-21	-65	-65	--	--	--
Dissolved Zinc	mg/L	0.0051	0.0051	0.0010	-	-80	-80	-	-	0.013	0.5	0.4

Footnotes:

Only one water sample was taken in 2014 from Third Portage Pit Sump. There is not enough water quality samples taken to calculate the mean and lower 25th centile values. For this reason, no table was produced for Third Portage Pit.

Highlighted values represent exceedences of greater than 20% relative percent difference between predicted vs measured values.

* Used year 5 predictions for Vault and year 3 for Goose presented in Golder, 2007 - Water Quality Predictions Meadowbank Gold Project Doc No 516. Ver 0

+ Some have no lower 25th percentile data as only 2 or 1 samples were monitored in 2014

** Discharge criteria and guidelines based on total metal concentrations. Sulphate guideline based on threshold value from BC Environment guideline for the protection of aquatic life for very soft water (0-30 mg/L) (April 2013).

Highlighted values in yellow indicate a mean measured value greater than the discharge criteria or guidelines.

**2015 Comparison of predicted pit water quantity and quality to the measured water quantity and quality
LIFE OF MINE YEAR 6**

Water Quantity^

Pits**	Predicted (m³)	Measured (m³)	% Difference between predicted vs measured	Predicted Model Year
Portage	715 200	136 627	-81	5
Bay Goose	1 086 400	383 800	-65	5
Vault Pit	46 100	111 336	142	5

^Predicted volumes from Golder 2007 - Waste and Water Management Plan - Meadowbank Gold Project, Table 12.1 and Figures 12.7

**There is no year 6 in the predicted model so take year 5 for Portage and Vault. For Goose, pit reflooding started in 2015, use year 5 reflooding values minus evaporation for Goose.

Vault Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 6*	Possible Poor end Scenario Predicted Model Year 6*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to Wally Lake**
				Mean	Lower 25th centile*	Probable	Possible Poor	Probable	Possible Poor			
pH		8.00	8.00	7.11	-	-11	-11	-	-	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	0.160	0.17	126	-	78 650	641	-	-	-	-	-
Ammonia (unionized)	mg N/L	0.55	0.92	0.3200	-	-42	-65	-	-	0.016	-	-
Ammonia nitrogen	mg N/L	45	76	22.6	-	-50	-70	-	-	1.83	-	20
Dissolved Arsenic	mg/L	0.00011	0.089	0.0003	-	127	-100	-	-	0.005	0.5	0.1
Chloride	mg/L	0.0054	0.057	0.33	-	614 715	58 146	-	-	120	-	500
Dissolved Copper	mg/L	0.0000110	0.00130	0.0010	-	8 991	-23	-	-	0.002	0.3	0.1
Fluoride	mg/L	0.0000110	0.022	0.25	-	2 272 627	1 036	-	-	0.12	-	-
Hardness	mg CaCO3/L	0.20	32	340	-	169 900	963	-	-	-	-	-
Dissolved Lead	mg/L	0.0000140	0.000019	0.0002	-	10 614	689	-	-	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.000021	0.00019	0.0218	-	103 710	11 374	-	-	0.025	0.5	0.2
Dissolved Barium	mg/L	0.000039	0.020	0.0703	-	180 156	252	-	-	-	-	-
Dissolved Cadmium	mg/L	0.0000014	0.000019	0.0000	-	614	-47	-	-	0.00004	-	0.002
Dissolved Iron	mg/L	0.0000110	0.004	0.5900	-	536 264	16 757	-	-	0.3	-	-
Dissolved Mercury	mg/L	0.000000140	0.000019	0.00001	-	3 471	-74	-	-	0.000026	-	0.0004
Dissolved Manganese	mg/L	0.000030	0.00390	0.0863	-	287 567	2 113	-	-	0.23	-	-
Dissolved Molybdenum	mg/L	0.000280	0.05300	0.1111	-	39 579	110	-	-	0.073	-	-
Dissolved Selenium	mg/L	0.0000069	0.00094	0.0040	-	57 871	326	-	-	0.001	-	-
Dissolved Thallium	mg/L	0.0000036	0.000039	0.0025	-	68 344	6 310	-	-	0.0008	-	-
Nitrate	mg/L	50	86	45.90	-	-47	-	-	-	2.94	-	50
Sulphate	mg/L	0.02	17	124	-	729 312	629	-	-	128	-	-
Total dissolved solids	mg/L	100	240	568	-	468	137	-	-	-	-	-
Dissolved Zinc	mg/L	0.000069	0.00089	0.0005	-	625	-44	-	-	0.013	0.5	0.2

Goose Island Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 3*	Possible Poor end Scenario Predicted Model Year 3*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile *		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to 3PL**
				Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor			
pH		6.10	6.10	7.37	7.06	21	21	16	16	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	27	27	57	52	109	109	91	91	-	-	-
Ammonia (unionized)	mg N/L	0.00056	0.00056	0.0138	0.0088	2 355	2 355	1 463	1 463	0.016	-	-
Ammonia nitrogen	mg N/L	5.4	5	1.1	0.8	-79	-79	-84	-84	1.83	-	16
Dissolved Arsenic	mg/L	0.0016	0.0016	0.0003	0.0003	-84	-84	-84	-84	0.005	0.5	0.3
Chloride	mg/L	440	440	22	16	-95	-95	-96	-96	120	-	1000
Dissolved Copper	mg/L	0.001	0.001	0.0013	0.0006	35	35	-34	-34	0.002	0.3	0.1
Fluoride	mg/L	0.13	0.13	0.40	0.36	205	205	173	173	0.12	-	-
Hardness	mg CaCO3/L	210	210	134	116	-36	-36	-45	-45	-	-	-
Dissolved Lead	mg/L	0.0011	0.0011	0.0002	0.0002	-82	-82	-86	-86	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.002	0.002	0.0326	0.0232	1 532	1 532	1 060	1 060	0.025	0.5	0.2
Dissolved Barium	mg/L	0.027	0.0270	0.0173	0.0151	-36	-36	-44	-44	-	-	-
Dissolved Cadmium	mg/L	0.000051	0.000051	0.0000	0.0000	-74	-74	-80	-80	0.00004	-	0.002
Dissolved Iron	mg/L	0.25	0.25	0.0050	0.0050	-98	-98	-98	-98	0.3	-	-
Dissolved Mercury	mg/L	0.0000039	0.0000039	0.00001	0.00001	156	156	28	28	0.000026	-	0.0004
Dissolved Manganese	mg/L	0.13	0.13	0.1776	0.1642	37	37	26	26	0.23	-	-
Dissolved Molybdenum	mg/L	0.0086	0.0086	0.0099	0.0089	16	16	3	3	0.073	-	-
Dissolved Selenium	mg/L	0.0002	0.0002	0.0015	0.0013	650	650	525	525	0.001	-	-
Dissolved Thallium	mg/L	0.00002	0.00002	0.0025	0.0025	12 400	12 400	12 400	12 400	0.0008	-	-
Nitrate	mg/L	4.00	4.00	2.96	2.50	-26	-26	-38	-38	2.94	-	20
Sulphate	mg/L	21	21	79	60	276	276	185	185	128	-	-
Total dissolved solids	mg/L	670	670	180	114	-73	-73	-83	-83	-	-	-
Dissolved Zinc	mg/L	0.0051	0.0051	0.0005	0.0005	-90	-90	-90	-90	0.013	0.5	0.4

Third Portage Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 4*	Possible Poor end Scenario Predicted Model Year 4*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile *		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to 3PL**
				Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor			
pH		6.30	6.10	6.66	6.36	6	9	1	4	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	40	43	64	60	59	48	49	38	-	-	-
Ammonia (unionized)	mg N/L	0.00052	0.00055	0.0467	0.0250	8 874	8 385	4 708	4 445	0.016	-	-
Ammonia nitrogen	mg N/L	2.1	4	2.8	2.2	31	-21	5	-37	1.83	-	16
Dissolved Arsenic	mg/L	0.0024	0.0680	0.0160	-	567	-76	-	-	0.005	0.5	0.3
Chloride	mg/L	620	630	15	-	-98	-98	-	-	120	-	1000
Dissolved Copper	mg/L	0.0014	0.016	0.0003	-	-82	-98	-	-	0.002	0.3	0.1
Fluoride	mg/L	0.19	0.24	0.27	-	39	10	-	-	0.12	-	-
Hardness	mg CaCO3/L	300	310	196	-	-35	-37	-	-	-	-	-
Dissolved Lead	mg/L	0.0016	0.0076	0.0002	-	-91	-98	-	-	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.003	0.093	0.0323	-	1 012	-65	-	-	0.025	0.5	0.2
Dissolved Barium	mg/L	0.041	0.0630	0.0111	-	-73	-82	-	-	-	-	-
Dissolved Cadmium	mg/L	0.000076	0.00027	0.0000	-	-87	-96	-	-	0.00004	-	0.002
Dissolved Iron	mg/L	0.37	4.60	0.0050	-	-99	-100	-	-	0.3	-	-
Dissolved Mercury	mg/L	0.000059	0.0000540	0.00001	-	112	-77	-	-	0.000026	-	0.0004
Dissolved Manganese	mg/L	0.19	0.66	0.0921	-	-52	-86	-	-	0.23	-	-
Dissolved Molybdenum	mg/L	0.013	0.013	0.0628	-	383	383	-	-	0.073	-	-
Dissolved Selenium	mg/L	0.0003	0.0012	0.0015	-	417	25	-	-	0.001	-	-
Dissolved Thallium	mg/L	0.00003	0.00012	0.0025	-	7 965	1 983	-	-	0.0008	-	-
Nitrate	mg/L	2.30	4.00	10.47	-	355	162	-	-	2.94	-	20
Sulphate	mg/L	31	46	136	-	337	195	-	-	128	-	-
Total dissolved solids	mg/L	960	990	498	363	-48	-50	-62	-63	-	-	-
Dissolved Zinc	mg/L	0.0076	0.0850	0.0005	-	-93	-99	-	-	0.013	0.5	0.4

**2015 Comparison of predicted pit water quantity and quality to the measured water quantity and quality
LIFE OF MINE YEAR 6**

North Portage Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 4*	Possible Poor and Scenario Predicted Model Year 4*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile *		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to 3PL**
				Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor			
pH		6.30	6.10	7.87	7.45	25	29	18	22	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	0.05	2.4	77	68	153 614	3 102	134 900	2 713	--	--	--
Ammonia (unionized)	mg N/L	0.003	0.0014	0.0557	0.0350	1 757	3 880	1 067	2 400	0.016	--	--
Ammonia nitrogen	mg N/L	12	8.9	2.9	1.8	-76	-67	-85	-80	1.53	--	16
Dissolved Arsenic	mg/L	0.00005	0.056	0.0205	-	45 344	-63	-	-	0.005	0.5	0.3
Chloride	mg/L	0.0010	0.25	17	12	1 757 553	6 790	1 247 349	4 790	120	--	1000
Dissolved Copper	mg/L	0.00001	0.007	0.0007	-	6 036	-90	-	-	0.002	0.3	0.1
Fluoride	mg/L	0.000008	0.031	0.31	0.29	3 812 400	884	3 656 150	844	0.12	--	--
Hardness	mg CaCO3/L	0.05	8	239	191	530 456	2 884	423 789	2 284	--	--	--
Dissolved Lead	mg/L	0.000002	0.0029	0.0002	-	10 127	-92	-	-	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.00003	0.043	0.0071	-	20 782	-83	-	-	0.025	0.5	0.2
Dissolved Barium	mg/L	0.00002	0.013	0.0092	-	48 058	-30	-	-	--	--	--
Dissolved Cadmium	mg/L	0.0000006	0.000099	0.0000	-	1 567	-90	-	-	0.00004	--	0.002
Dissolved Iron	mg/L	0.000097	2.1	0.0075	-	7 632	-100	-	-	0.3	--	--
Dissolved Mercury	mg/L	0.00000056	0.000029	0.00001	-	8 829	-83	-	-	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.0002	0.22	0.0706	-	46 967	-68	-	-	0.23	--	--
Dissolved Molybdenum	mg/L	0.000004	0.00081	0.0182	-	454 900	2 147	-	-	0.073	--	--
Dissolved Selenium	mg/L	0.000003	0.00058	0.0010	-	33 233	72	-	-	0.001	--	--
Dissolved Thallium	mg/L	0.0000014	0.000057	0.0038	-	267 757	6 479	-	-	0.0008	--	--
Nitrate	mg/L	13	10.00	11.90	9.72	-5	19	-25	-3	2.94	--	20
Sulphate	mg/L	0.011	8.8	179	135	1 630 809	1 939	1 226 264	1 433	128	--	--
Total dissolved solids	mg/L	28	41	399	309	1 326	874	1 004	654	--	--	--
Dissolved Zinc	mg/L	0.000032	0.037	0.0008	-	2 244	-98	-	-	0.013	0.5	0.4

Footnotes:

Highlighted values represent exceedences of greater than 20% relative percent difference between predicted vs measured values.

* Used year 6 predictions for Vault, year 3 for Goose and year 4 for Portage as presented in Golder, 2007 - Water Quality Predictions Meadowbank Gold Project Doc No 516. Ver 0

+ Some have no lower 25th percentile data as only 1 or 2 samples were taken in 2015.

** Discharge criteria and guidelines based on total metal concentrations. Sulphate guideline based on threshold value from BC Environment guideline for the protection of aquatic life for very soft water (0-30 mg/L) (April 2013).

Highlighted values in yellow indicate a mean measured value greater than the discharge criteria or guidelines.

**2016 Comparison of predicted pit water quantity and quality to the measured water quantity and quality
LIFE OF MINE YEAR 7**

Water Quantity ^

Pits**	Predicted (m ³)	Measured (m ³)	% Difference between predicted vs measured	Predicted Model Year
Portage	715 200	132 359	-81	5
Bay Goose	800 100	375 300	-53	7
Vault Pit	55 600	54 964	-1	7

*Predicted volumes from Golder 2007 - Waste and Water Management Plan - Meadowbank Gold Project, Table 12.1 and Figures 12.8

**For year 7, in the predicted model, there is no value for the volume of water transferred from Portage Pit to the Reclaim Pond, so take year 5 values for Portage. For Goose, use year 7 reflooding values minus evaporation for Goose.

Vault Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 7*	Possible Poor end Scenario Predicted Model Year 7*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to Wally Lake**
				Mean	Lower 25th centile*	Probable	Possible Poor	Probable	Possible Poor			
pH		8.00	8.00	7.76	7.56	-3	-3	-6	-6	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	0.220	23	95	87	42 968	312	39 445	278	--	--	--
Ammonia (unionized)	mg N/L	0.40	0.67	0.113	0.110	-72	-83	-73	-84	0.016	--	--
Ammonia nitrogen	mg N/L	33	55	5.0	3.7	-85	-91	-89	-93	1.83	--	20
Dissolved Arsenic	mg/L	0.00015	0.120	0.0023	0.0003	1 400	-98	67	-100	0.005	0.5	0.1
Chloride	mg/L	0.0075	0.079	.29	.17	390 900	37 020	223 567	21 134	120	--	500
Dissolved Copper	mg/L	0.0000150	0.00180	0.0023	0.0005	15 483	30	3 317	-72	0.002	0.3	0.1
Fluoride	mg/L	0.0000150	0.031	0.19	0.19	1 266 567	513	1 233 233	497	0.12	--	--
Hardness	mg CaCO3/L	0.27	45	332	258	122 956	638	95 270	472	--	--	--
Dissolved Lead	mg/L	0.0000190	0.000027	0.0002	0.0002	7 795	456	7 795	456	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.000030	0.00027	0.0065	0.0024	21 692	2 321	7 858	784	0.025	0.5	0.2
Dissolved Barium	mg/L	0.000054	0.028	0.0306	0.0193	56 474	9	35 641	-31	--	--	--
Dissolved Cadmium	mg/L	0.0000019	0.000027	0.0001	0.0001	6 742	381	3 979	187	0.00004	--	0.002
Dissolved Iron	mg/L	0.000150	0.005	0.0350	0.0250	23 233	629	16 567	421	0.3	--	--
Dissolved Mercury	mg/L	0.000000190	0.000027	0.000018	0.00001	9 111	-35	2 532	-81	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.000042	0.00540	0.1398	0.0952	332 757	2 489	226 567	1 663	0.23	--	--
Dissolved Molybdenum	mg/L	0.0000390	0.07300	0.0659	0.0533	16 785	-10	13 560	-27	0.073	--	--
Dissolved Selenium	mg/L	0.0000097	0.00130	0.0039	0.0024	39 848	198	24 385	83	0.001	--	--
Dissolved Thallium	mg/L	0.0000050	0.000054	0.0005	0.0004	10 900	919	7 900	641	0.0008	--	--
Nitrate	mg/L	36	62	19.85	9.83	-62	-45	-73	-84	2.94	--	50
Sulphate	mg/L	0.02	24	144	143	599 796	500	595 629	496	128	--	--
Total dissolved solids	mg/L	76	210	529	441	596	152	480	110	--	--	--
Dissolved Zinc	mg/L	0.000097	0.00120	0.0008	0.0005	673	-38	415	-58	0.013	0.5	0.2

Goose Island Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 3*	Possible Poor end Scenario Predicted Model Year 3*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile *		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to 3PL**
				Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor			
pH		6.10	6.10	7.73	7.63	27	27	25	25	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	27	27	47	45	74	74	66	66	--	--	--
Ammonia (unionized)	mg N/L	0.00056	0.00056	0.0050	0.0050	793	793	793	793	0.016	--	--
Ammonia nitrogen	mg N/L	5.4	5	0.1	0.0	-98	-98	-99	-99	1.83	--	16
Dissolved Arsenic	mg/L	0.0016	0.0016	0.0003	0.0003	-84	-84	-84	-84	0.005	0.5	0.3
Chloride	mg/L	440	440	13	12	-97	-97	-97	-97	120	--	1000
Dissolved Copper	mg/L	0.001	0.001	0.0009	0.0004	-7	-7	-54	-54	0.002	0.03	0.1
Fluoride	mg/L	0.13	0.13	0.34	0.33	163	163	154	154	0.12	--	--
Hardness	mg CaCO3/L	210	210	127	113	-40	-40	-46	-46	--	--	--
Dissolved Lead	mg/L	0.0011	0.0011	0.0002	0.0002	-86	-86	-86	-86	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.002	0.002	0.0352	0.0260	1 660	1 660	1 201	1 201	0.025	0.5	0.2
Dissolved Barium	mg/L	0.027	0.0270	0.0162	0.0142	-40	-40	-48	-48	--	--	--
Dissolved Cadmium	mg/L	0.000051	0.000051	0.0000	0.0000	-75	-75	-80	-80	0.00004	--	0.002
Dissolved Iron	mg/L	0.25	0.25	0.0050	0.0050	-98	-98	-98	-98	0.3	--	--
Dissolved Mercury	mg/L	0.0000039	0.0000039	0.00001	0.00001	60	60	28	28	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.13	0.13	0.0480	0.0244	-63	-63	-81	-81	0.23	--	--
Dissolved Molybdenum	mg/L	0.0086	0.0086	0.0064	0.0060	-25	-25	-30	-30	0.073	--	--
Dissolved Selenium	mg/L	0.0002	0.0002	0.0008	0.0005	275	275	150	150	0.001	--	--
Dissolved Thallium	mg/L	0.00002	0.00002	0.0006	0.0004	2 650	2 650	1 900	1 900	0.0008	--	--
Nitrate	mg/L	4.00	4.00	3.72	3.55	-7	-7	-11	-11	2.94	--	20
Sulphate	mg/L	21	21	84	80	301	301	279	279	128	--	--
Total dissolved solids	mg/L	670	670	238	229	-64	-64	-66	-66	--	--	--
Dissolved Zinc	mg/L	0.0051	0.0051	0.0005	0.0005	-90	-90	-90	-90	0.013	0.5	0.4

Third Portage Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 4*	Possible Poor end Scenario Predicted Model Year 4*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile *		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to 3PL**
				Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor			
pH		6.30	6.10	7.70	-	22	26	-	-	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	40	43	64	54	59	48	34	24	--	--	--
Ammonia (unionized)	mg N/L	0.00052	0.00055	0.0833	0.0300	15 926	15 052	5 669	5 355	0.016	--	--
Ammonia nitrogen	mg N/L	2.1	4	5.3	4.4	153	52	108	25	1.83	--	16
Dissolved Arsenic	mg/L	0.0024	0.0680	0.0003	-	-90	-100	-	-	0.005	0.5	0.3
Chloride	mg/L	620	630	31	29	-95	-95	-95	-95	120	--	1000
Dissolved Copper	mg/L	0.0014	0.016	0.0010	-	-29	-94	-	-	0.002	0.3	0.1
Fluoride	mg/L	0.19	0.24	0.51	0.42	167	111	118	73	0.12	--	--
Hardness	mg CaCO3/L	300	310	273	199	-9	-12	-34	-36	--	--	--
Dissolved Lead	mg/L	0.0016	0.0076	0.0002	-	-91	-98	-	-	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.003	0.093	0.0072	-	148	-92	-	-	0.025	0.5	0.2
Dissolved Barium	mg/L	0.041	0.0630	0.0173	-	-58	-73	-	-	--	--	--
Dissolved Cadmium	mg/L	0.000076	0.00027	0.0002	-	216	-11	-	-	0.00004	--	0.002
Dissolved Iron	mg/L	0.37	4.60	0.0200	-	-95	-100	-	-	0.3	--	--
Dissolved Mercury	mg/L	0.0000059	0.0000540	0.00005	-	747	-7	-	-	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.19	0.66	0.5854	-	208	-11	-	-	0.23	--	--
Dissolved Molybdenum	mg/L	0.013	0.013	0.0867	-	567	567	-	-	0.073	--	--
Dissolved Selenium	mg/L	0.0003	0.0012	0.0020	-	590	67	-	-	0.001	--	--
Dissolved Thallium	mg/L	0.00003	0.00012	0.0004	-	1 190	233	-	-	0.0008	--	--
Nitrate	mg/L	2.30	4.00	4.34	1.62	89	9	-30	-60	2.94	--	20
Sulphate	mg/L	31	46	245	153	691	433	394	233	128	--	--
Total dissolved solids	mg/L	960	990	562	470	-41	-43	-51	-53	--	--	--
Dissolved Zinc	mg/L	0.0076	0.0850	0.0040	-	-47	-95	-	-	0.013	0.5	0.4

**2016 Comparison of predicted pit water quantity and quality to the measured water quantity and quality
LIFE OF MINE YEAR 7**

North Portage Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 4*	Possible Poor and Scenario Predicted Model Year 4*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile *		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to 3PL**
				Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor			
pH		6.30	6.10	7.91	7.92	26	30	26	30	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	0.05	2.4	97	79	194 186	3 948	157 900	3 192	--	--	--
Ammonia (unionized)	mg N/L	0.003	0.0014	0.0914	0.0600	2 948	6 431	1 900	4 186	0.016	--	--
Ammonia nitrogen	mg N/L	12	8.9	3.7	2.6	-69	-58	-77	-69	1.53	--	16
Dissolved Arsenic	mg/L	0.00005	0.056	0.0140	0.0061	30 928	-75	13 372	-89	0.005	0.5	0.3
Chloride	mg/L	0.0010	0.25	24	19	2 415 352	9 369	1 918 267	7 420	120	--	1000
Dissolved Copper	mg/L	0.00001	0.007	0.0013	0.0007	11 264	-82	6 036	-90	0.002	0.3	0.1
Fluoride	mg/L	0.000008	0.031	0.43	0.35	5 357 043	1 282	4 312 400	1 013	0.12	--	--
Hardness	mg CaCO3/L	0.05	8	306	236	679 583	3 723	524 344	2 850	--	--	--
Dissolved Lead	mg/L	0.000002	0.0029	0.0002	0.0002	6 718	-95	6 718	-95	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.00003	0.043	0.0325	0.0253	95 488	-24	74 165	-41	0.025	0.5	0.2
Dissolved Barium	mg/L	0.00002	0.013	0.0207	0.0150	108 979	59	78 847	15	--	--	--
Dissolved Cadmium	mg/L	0.0000006	0.000099	0.0004	0.0002	61 150	271	32 400	97	0.00004	--	0.002
Dissolved Iron	mg/L	0.000097	2.1	0.0063	0.0050	6 343	-100	5 055	-100	0.3	--	--
Dissolved Mercury	mg/L	0.00000056	0.000029	0.00002	0.00001	33 382	-35	8 829	-83	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.0002	0.22	0.1373	0.1225	91 433	-38	81 533	-44	0.23	--	--
Dissolved Molybdenum	mg/L	0.000004	0.00081	0.1319	0.1192	3 296 775	16 181	2 979 275	14 613	0.073	--	--
Dissolved Selenium	mg/L	0.000003	0.00058	0.0020	0.0010	66 567	245	33 233	72	0.001	--	--
Dissolved Thallium	mg/L	0.0000014	0.000057	0.0004	0.0004	28 471	602	28 471	602	0.0008	--	--
Nitrate	mg/L	13	10.00	12.65	12.60	-2	27	-3	26	2.94	--	20
Sulphate	mg/L	0.011	8.8	232	195	2 107 692	1 752	1 772 627	2 116	128	--	--
Total dissolved solids	mg/L	28	41	518	455	1 164	1 164	1 523	1 009	--	--	--
Dissolved Zinc	mg/L	0.000032	0.037	0.0021	0.0009	6 541	-94	2 634	-98	0.013	0.5	0.4

Footnotes:

Highlighted values represent exceedences of greater than 20% relative percent difference between predicted vs measured values.

* Used year 7 predictions for Vault, year 3 for Goose and year 4 for Portage as presented in Golder, 2007 - Water Quality Predictions Meadowbank Gold Project Doc No 516. Ver 0

+ Some have no lower 25th percentile data as only 1 or 2 samples were taken in 2016.

** Discharge criteria and guidelines based on total metal concentrations. Sulphate guideline based on threshold value from BC Environment guideline for the protection of aquatic life for very soft water (0-30 mg/L) (April 2013).

Highlighted values in yellow indicate a mean measured value greater than the discharge criteria or guidelines.

**2017 Comparison of predicted pit water quantity and quality to the measured water quantity and quality
LIFE OF MINE YEAR 8**

Water Quantity^

Pits**	Predicted (m ³)	Measured (m ³)	% Difference between predicted vs measured	Predicted Model Year
Portage	715 200	341 192	-52	5
Bay Goose	635 200	464 019	-27	8
Vault Pit	53 900	249 513	363	8

[^] Predicted volumes from Golder 2007 - Waste and Water Management Plan - Meadowbank Gold Project, Table 12.1 and Figures 12.9

**For year 8, in the predicted model, there is no value for the volume of water transferred from Portage Pit to the Reclaim Pond, so take year 5 values for Portage. For Goose, use year 8 reflowing values minus evaporation for Goose.

Vault Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 7*	Possible Poor end Scenario Predicted Model Year 7*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to Wally Lake**
				Mean	Lower 25th centile*	Probable	Possible Poor	Probable	Possible Poor			
pH		8.00	8.00	7.72	7.44	-4	-4	-7	-7	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	0.220	23	120	110	54 218	420	50 014	379	--	--	--
Ammonia (unionized)	mg N/L	0.40	0.67	0.083	0.070	-79	-88	-83	-90	0.016	--	--
Ammonia nitrogen	mg N/L	33	55	3.8	3.5	-88	-93	-89	-94	1.83	--	20
Dissolved Arsenic	mg/L	0.00015	0.120	0.0046	0.0003	2 950	-96	67	-100	0.005	0.5	0.1
Chloride	mg/L	0.0075	0.079	36	26	474 344	44 942	344 900	32 653	120	--	500
Dissolved Copper	mg/L	0.0000150	0.00180	0.0013	0.0003	8 400	-29	1 567	-86	0.002	0.3	0.1
Fluoride	mg/L	0.0000150	0.031	0.19	0.17	1 244 344	502	1 099 900	432	0.12	--	--
Hardness	mg CaCO3/L	0.27	45	290	249	107 246	544	91 937	452	--	--	--
Dissolved Lead	mg/L	0.0000190	0.000027	0.0005	0.0002	24 900	1 659	7 795	456	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.000030	0.00027	0.0077	0.0033	25 428	2 736	10 733	1 104	0.025	0.5	0.2
Dissolved Barium	mg/L	0.000054	0.028	0.0271	0.0213	50 162	-3	39 391	-24	--	--	--
Dissolved Cadmium	mg/L	0.0000019	0.000027	0.0000	0.0000	1 918	42	426	-63	0.00004	--	0.002
Dissolved Iron	mg/L	0.000150	0.005	0.6200	0.0113	413 233	12 817	7 400	134	0.3	--	--
Dissolved Mercury	mg/L	0.00000190	0.000027	0.00002	0.00001	7 795	-44	2 532	-81	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.000042	0.00540	0.2675	0.1847	636 805	4 854	439 662	3 320	0.23	--	--
Dissolved Molybdenum	mg/L	0.000390	0.07300	0.0283	0.0144	7 159	-61	3 579	-80	0.073	--	--
Dissolved Selenium	mg/L	0.0000097	0.00130	0.0016	0.0013	16 223	22	12 787	-4	0.001	--	--
Dissolved Thallium	mg/L	0.0000500	0.000054	0.0004	0.0004	7 900	641	7 900	641	0.0008	--	--
Nitrate	mg/L	36	62	4.23	1.28	-88	-93	-96	-98	2.94	--	50
Sulphate	mg/L	0.02	24	146	76	609 761	510	315 004	215	128	--	--
Total dissolved solids	mg/L	76	210	464	411	511	121	441	96	--	--	--
Dissolved Zinc	mg/L	0.000097	0.00120	0.0008	0.0005	759	-31	415	-58	0.013	0.5	0.2

Goose Island Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 3*	Possible Poor end Scenario Predicted Model Year 3*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile *		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to 3PL**
				Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor			
pH		6.10	6.10	7.92	7.81	30	30	28	28	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	27	27	86	83	217	217	207	207	--	--	--
Ammonia (unionized)	mg N/L	0.00056	0.00056	0.0183	0.0125	3 174	3 174	2 132	2 132	0.016	--	--
Ammonia nitrogen	mg N/L	5.4	5	1.2	1.0	-79	-79	-82	-82	1.83	--	16
Dissolved Arsenic	mg/L	0.0016	0.0016	0.0003	0.0003	-84	-84	-84	-84	0.005	0.5	0.3
Chloride	mg/L	440	440	13	12	-97	-97	-97	-97	120	--	1000
Dissolved Copper	mg/L	0.001	0.001	0.0009	0.0007	-9	-9	-26	-26	0.002	0.3	0.1
Fluoride	mg/L	0.13	0.13	0.18	0.17	41	41	27	27	0.12	--	--
Hardness	mg CaCO3/L	210	210	226	208	8	8	-1	-1	--	--	--
Dissolved Lead	mg/L	0.0011	0.0011	0.0002	0.0002	-86	-86	-86	-86	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.002	0.002	0.0702	0.0638	3 410	3 410	3 088	3 088	0.025	0.5	0.2
Dissolved Barium	mg/L	0.027	0.0270	0.0378	0.0341	40	40	26	26	--	--	--
Dissolved Cadmium	mg/L	0.000051	0.000051	0.0000	0.0000	-80	-80	-80	-80	0.00004	--	0.002
Dissolved Iron	mg/L	0.25	0.25	0.0050	0.0050	-98	-98	-98	-98	0.3	--	--
Dissolved Mercury	mg/L	0.0000039	0.0000039	0.00002	0.00001	285	285	92	92	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.13	0.13	0.0842	0.0788	-35	-35	-39	-39	0.23	--	--
Dissolved Molybdenum	mg/L	0.0086	0.0086	0.0070	0.0065	-19	-19	-24	-24	0.073	--	--
Dissolved Selenium	mg/L	0.0002	0.0002	0.0015	0.0013	650	650	525	525	0.001	--	--
Dissolved Thallium	mg/L	0.00002	0.00002	0.0004	0.0004	1 900	1 900	1 900	1 900	0.0008	--	--
Nitrate	mg/L	4.00	4.00	13.22	9.68	230	230	142	142	2.94	--	20
Sulphate	mg/L	21	21	147	134	602	602	538	538	128	--	--
Total dissolved solids	mg/L	670	670	423	406	-37	-37	-39	-39	--	--	--
Dissolved Zinc	mg/L	0.0051	0.0051	0.0018	0.0008	-64	-64	-85	-85	0.013	0.5	0.4

Third Portage Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 4*	Possible Poor end Scenario Predicted Model Year 4*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile *		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to 3PL**
				Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor			
pH		6.30	6.10	8.14	8.05	29	33	28	32	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	40	43	77	74	92	78	85	72	--	--	--
Ammonia (unionized)	mg N/L	0.00052	0.00055	0.0617	0.0425	11 759	11 112	8 073	7 627	0.016	--	--
Ammonia nitrogen	mg N/L	2.1	4	4.2	3.7	100	20	76	6	1.83	--	16
Dissolved Arsenic	mg/L	0.0024	0.0680	0.0003	0.0003	-90	-100	-90	-100	0.005	0.5	0.3
Chloride	mg/L	620	630	29	28	-95	-95	-95	-96	120	--	1000
Dissolved Copper	mg/L	0.0014	0.016	0.0004	0.0003	-74	-98	-82	-98	0.002	0.3	0.1
Fluoride	mg/L	0.19	0.24	0.39	0.38	104	61	97	56	0.12	--	--
Hardness	mg CaCO3/L	300	310	192	179	-36	-38	-40	-42	--	--	--
Dissolved Lead	mg/L	0.0016	0.0076	0.0002	0.0002	-91	-98	-91	-98	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.003	0.093	0.0175	0.0137	503	-81	372	-85	0.025	0.5	0.2
Dissolved Barium	mg/L	0.041	0.0630	0.0101	0.0090	-75	-84	-78	-86	--	--	--
Dissolved Cadmium	mg/L	0.000076	0.00027	0.0000	0.0000	-61	-89	-87	-96	0.00004	--	0.002
Dissolved Iron	mg/L	0.37	4.60	0.0050	0.0050	-99	-100	-99	-100	0.3	--	--
Dissolved Mercury	mg/L	0.000059	0.0000540	0.00004	0.00004	634	-20	493	-35	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.19	0.66	0.0735	0.0577	-61	-89	-70	-91	0.23	--	--
Dissolved Molybdenum	mg/L	0.013	0.013	0.0279	0.0271	115	115	108	108	0.073	--	--
Dissolved Selenium	mg/L	0.0003	0.0012	0.0017	0.0010	475	39	245	-17	0.001	--	--
Dissolved Thallium	mg/L	0.00003	0.00012	0.0004	0.0004	1 190	233	1 190	233	0.0008	--	--
Nitrate	mg/L	2.30	4.00	7.56	5.50	229	89	139	37	2.94	--	20
Sulphate	mg/L	31	46	129	124	316	180	298	168	128	--	--
Total dissolved solids	mg/L	960	990	388	376	-60	-61	-61	-62	--	--	--
Dissolved Zinc	mg/L	0.0076	0.0850	0.0005	0.0005	-93	-99	-93	-99	0.013	0.5	0.4

**2017 Comparison of predicted pit water quantity and quality to the measured water quantity and quality
LIFE OF MINE YEAR 8**

North Portage Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 4*	Possible Poor and Scenario Predicted Model Year 4*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile *		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to 3PL**
				Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor			
pH		6.30	6.10	7.85	7.61	25	29	21	25	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	0.05	2.4	98	81	196 700	4 000	161 900	3 275	--	--	--
Ammonia (unionized)	mg N/L	0.003	0.0014	0.0717	0.0100	2 289	5 019	233	614	0.016	--	--
Ammonia nitrogen	mg N/L	12	8.9	2.6	0.7	-78	-71	-94	-92	1.53	--	16
Dissolved Arsenic	mg/L	0.00005	0.056	0.0203	0.0118	44 937	-64	26 011	-79	0.005	0.5	0.3
Chloride	mg/L	0.0010	0.25	25	16	2 553 641	9 911	1 601 941	6 180	120	--	1000
Dissolved Copper	mg/L	0.00001	0.007	0.0016	0.0003	14 021	-78	2 173	-96	0.002	0.3	0.1
Fluoride	mg/L	0.000008	0.031	0.42	0.38	5 250 733	1 255	4 749 900	1 126	0.12	--	--
Hardness	mg CaCO3/L	0.05	8	214	201	476 048	2 578	446 567	2 413	--	--	--
Dissolved Lead	mg/L	0.000002	0.0029	0.0009	0.0002	40 506	-69	6 718	-95	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.00003	0.043	0.0290	0.0251	85 214	-33	73 724	-42	0.025	0.5	0.2
Dissolved Barium	mg/L	0.00002	0.013	0.0159	0.0130	83 689	22	68 058	0	--	--	--
Dissolved Cadmium	mg/L	0.0000006	0.000099	0.0001	0.0000	13 178	-20	1 567	-90	0.00004	--	0.002
Dissolved Iron	mg/L	0.000097	2.1	0.0200	0.0050	20 519	-99	5 055	-100	0.3	--	--
Dissolved Mercury	mg/L	0.00000056	0.000029	0.00002	0.00001	37 995	-26	8 829	-83	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.0002	0.22	0.1255	0.1112	83 589	-43	74 000	-49	0.23	--	--
Dissolved Molybdenum	mg/L	0.000004	0.00081	0.0592	0.0405	1 479 567	7 207	1 011 150	4 894	0.073	--	--
Dissolved Selenium	mg/L	0.000003	0.00058	0.0009	0.0005	30 567	59	16 567	-14	0.001	--	--
Dissolved Thallium	mg/L	0.0000014	0.000057	0.0004	0.0004	28 471	602	28 471	602	0.0008	--	--
Nitrate	mg/L	13	10.00	8.81	8.19	-32	-12	-52	-36	2.94	--	20
Sulphate	mg/L	0.011	8.8	186	159	1 690 809	2 014	1 445 355	1 707	128	--	--
Total dissolved solids	mg/L	28	41	463	396	1 555	1 030	1 314	866	--	--	--
Dissolved Zinc	mg/L	0.000032	0.037	0.0006	0.0005	1 619	-99	1 463	-99	0.013	0.5	0.4

Footnotes:

Highlighted values represent exceedences of greater than 20% relative percent difference between predicted vs measured values.

* Used year 7 predictions for Vault, year 3 for Goose and year 4 for Portage as presented in Golder, 2007 - Water Quality Predictions Meadowbank Gold Project Doc No 516. Ver 0

+ Some have no lower 25th percentile data as only 1 or 2 samples were taken in 2016.

** Discharge criteria and guidelines based on total metal concentrations. Sulphate guideline based on threshold value from BC Environment guideline for the protection of aquatic life for very soft water (0-30 mg/L) (April 2013).

Highlighted values in yellow indicate a mean measured value greater than the discharge criteria or guidelines.

**2018 Comparison of predicted pit water quantity and quality to the measured water quantity and quality
LIFE OF MINE YEAR 9**

Water Quantity^

Pits**	Predicted (m³)	Measured (m³)	% Difference between predicted vs measured	Predicted Model Year
Portage	715 200	117 803	-84	5
Bay Goose	635 200	327 114	-49	8
Vault Pit	53 900	88 469	64	8

^Predicted volumes from Golder 2007 - Waste and Water Management Plan - Meadowbank Gold Project, Table 12.1 and Figures 12.4 and 12.6

**For year 9, in the predicted model, there is no value for the volume of water transferred from Portage Pit to the Reclaim Pond, so take year 5 values for Portage. For Goose, use year 8 reflooding values minus evaporation for Goose. For Vault, use Year 8.

Vault Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 7*	Possible Poor end Scenario Predicted Model Year 7*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to Wally Lake**
				Mean	Lower 25th centile*	Probable	Possible Poor	Probable	Possible Poor			
pH		8.00	8.00	7.52	7.34	-6	-6	-8	-8	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	0.220	23	0.220	107	48 536	365	45 355	335	--	--	--
Ammonia (unionized)	mg N/L	0.40	0.67	0.0700	0.0600	-83	-90	-85	-91	0.016	--	--
Ammonia nitrogen	mg N/L	33	55	3.1	2.6	-91	-94	-92	-95	1.83	--	20
Dissolved Arsenic	mg/L	0.00015	0.120	0.0022	0.0003	1 393	-98	67	-100	0.005	0.5	0.1
Chloride	mg/L	0.0075	0.079	0.25	19	336 967	31 900	258 567	24 457	120	--	500
Dissolved Copper	mg/L	0.0000150	0.00180	0.0014	0.0005	9 367	-21	3 233	-72	0.002	0.3	0.1
Fluoride	mg/L	0.0000150	0.031	0.20	0.20	1 349 900	553	1 316 567	537	0.12	--	--
Hardness	mg CaCO3/L	0.27	45	287	176	106 122	537	65 085	291	--	--	--
Dissolved Lead	mg/L	0.0000190	0.00027	0.0002	0.0002	9 374	567	7 795	456	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.000030	0.00027	0.0055	0.0044	18 300	1 944	14 567	1 530	0.025	0.5	0.2
Dissolved Barium	mg/L	0.000054	0.028	0.0252	0.0184	46 567	-10	33 974	-34	--	--	--
Dissolved Cadmium	mg/L	0.0000019	0.000027	0.0002	0.0000	8 426	500	1 479	11	0.00004	--	0.002
Dissolved Iron	mg/L	0.000150	0.005	0.0130	0.0100	8 567	171	6 567	108	0.3	--	--
Dissolved Mercury	mg/L	0.00000190	0.000027	0.00001	0.00001	2 532	-81	2 532	-81	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.000042	0.00540	0.1330	0.0722	316 471	2 362	171 805	1 237	0.23	--	--
Dissolved Molybdenum	mg/L	0.000390	0.07300	0.0602	0.0480	15 331	-18	12 208	-34	0.073	--	--
Dissolved Selenium	mg/L	0.000097	0.00130	0.0009	0.0005	9 488	-28	5 055	-62	0.001	--	--
Dissolved Thallium	mg/L	0.000050	0.00054	0.0002	0.0001	4 300	307	1 900	85	0.0008	--	--
Nitrate	mg/L	36	62	4.95	4.29	-86	-92	-88	-93	2.94	--	50
Sulphate	mg/L	0.02	24	183	101	764 400	665	420 733	321	128	--	--
Total dissolved solids	mg/L	76	210	370	283	387	76	272	35	--	--	--
Dissolved Zinc	mg/L	0.000097	0.00120	0.0008	0.0005	725	-33	415	-58	0.013	0.5	0.2

Phaser Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 7*	Possible Poor end Scenario Predicted Model Year 7*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to Wally Lake**
				Mean	Lower 25th centile*	Probable	Possible Poor	Probable	Possible Poor			
pH		8.00	8.00	7.76	7.67	-3	-3	-4	-4	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	0.220	23	97	84	44 067	322	37 855	263	--	--	--
Ammonia (unionized)	mg N/L	0.40	0.67	0.1433	0.0400	-64	-79	-90	-94	0.016	--	--
Ammonia nitrogen	mg N/L	33	55	8.0	2.9	-76	-86	-91	-95	1.83	--	20
Dissolved Arsenic	mg/L	0.00015	0.120	0.0014	0.0003	817	-99	67	-100	0.005	0.5	0.1
Chloride	mg/L	0.0075	0.079	8	6	105 011	9 879	75 567	7 084	120	--	500
Dissolved Copper	mg/L	0.0000150	0.00180	0.0088	0.0055	58 678	390	36 733	207	0.002	0.3	0.1
Fluoride	mg/L	0.0000150	0.031	0.18	0.16	1 177 678	470	1 066 567	416	0.12	--	--
Hardness	mg CaCO3/L	0.27	45	250	197	92 369	455	72 956	338	--	--	--
Dissolved Lead	mg/L	0.0000190	0.00027	0.0003	0.0002	14 374	919	7 795	456	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.000030	0.00027	0.0097	0.0057	32 344	3 505	18 900	2 011	0.025	0.5	0.2
Dissolved Barium	mg/L	0.000054	0.028	0.0811	0.0595	149 993	189	110 085	113	--	--	--
Dissolved Cadmium	mg/L	0.0000019	0.000027	0.0001	0.0000	2 707	98	558	-54	0.00004	--	0.002
Dissolved Iron	mg/L	0.000150	0.005	0.0433	0.0050	28 789	803	3 233	4	0.3	--	--
Dissolved Mercury	mg/L	0.00000190	0.000027	0.00001	0.00001	2 532	-81	2 532	-81	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.000042	0.00540	0.1932	0.0833	459 781	3 477	198 174	1 442	0.23	--	--
Dissolved Molybdenum	mg/L	0.000390	0.07300	0.0178	0.0089	4 464	-76	2 169	-88	0.073	--	--
Dissolved Selenium	mg/L	0.000097	0.00130	0.0006	0.0003	5 742	-56	3 122	-76	0.001	--	--
Dissolved Thallium	mg/L	0.000050	0.00054	0.0001	0.0001	1 900	85	1 900	85	0.0008	--	--
Nitrate	mg/L	36	62	15.83	6.44	-56	-74	-82	-90	2.94	--	50
Sulphate	mg/L	0.02	24	131	84	545 733	446	348 442	249	128	--	--
Total dissolved solids	mg/L	76	210	344	276	352	64	263	31	--	--	--
Dissolved Zinc	mg/L	0.000097	0.00120	0.0037	0.0014	3 680	206	1 318	15	0.013	0.5	0.2

Goose Island Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 3*	Possible Poor end Scenario Predicted Model Year 3*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile *		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to 3PL**
				Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor			
pH		6.10	6.10	7.42	-	22	22	-	-	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	27	27	49	-	81	81	-	-	--	--	--
Ammonia (unionized)	mg N/L	0.00056	0.00056	0.0050	-	793	793	-	-	0.016	--	--
Ammonia nitrogen	mg N/L	5.4	5	0.1	-	-98	-98	-	-	1.83	--	16
Dissolved Arsenic	mg/L	0.0016	0.0016	0.0005	-	-67	-67	-	-	0.005	0.5	0.3
Chloride	mg/L	440	440	9	-	-98	-98	-	-	120	--	1000
Dissolved Copper	mg/L	0.001	0.001	0.0015	-	53	53	-	-	0.002	0.3	0.1
Fluoride	mg/L	0.13	0.13	0.23	-	77	77	-	-	0.12	--	--
Hardness	mg CaCO3/L	210	210	172	-	-18	-18	-	-	--	--	--
Dissolved Lead	mg/L	0.0011	0.0011	0.0007	-	-39	-39	-	-	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.002	0.002	0.1100	-	5 398	5 398	-	-	0.025	0.5	0.2
Dissolved Barium	mg/L	0.027	0.0270	0.0295	-	9	9	-	-	--	--	--
Dissolved Cadmium	mg/L	0.000051	0.000051	0.0001	-	18	18	-	-	0.00004	--	0.002
Dissolved Iron	mg/L	0.25	0.0050	0.0050	-	-98	-98	-	-	0.3	--	--
Dissolved Mercury	mg/L	0.0000039	0.0000039	0.00001	-	28	28	-	-	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.13	0.13	0.1245	-	-4	-4	-	-	0.23	--	--
Dissolved Molybdenum	mg/L	0.0086	0.0086	0.0052	-	-28	-28	-	-	0.073	--	--
Dissolved Selenium	mg/L	0.0002	0.0002	0.0025	-	1 150	1 150	-	-	0.001	--	--
Dissolved Thallium	mg/L	0.00002	0.00002	0.0001	-	400	400	-	-	0.0008	--	--
Nitrate	mg/L	4.00	4.00	6.82	-	70	70	-	-	2.94	--	20
Sulphate	mg/L	21	21	142	-	574	574	-	-	128	--	--
Total dissolved solids	mg/L	670	670	273	-	-59	-59	-	-	--	--	--
Dissolved Zinc	mg/L	0.0051	0.0051	0.0005	-	-90	-90	-	-	0.013	0.5	0.4

**2018 Comparison of predicted pit water quantity and quality to the measured water quantity and quality
LIFE OF MINE YEAR 9**

Third Portage Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 4*	Possible Poor end Scenario Predicted Model Year 4*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile*		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to 3PL**
				Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor			
pH		6.30	6.10	7.67	-	22	26	-	-	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	40	43	55	-	38	28	-	-	--	--	--
Ammonia (unionized)	mg N/L	0.00052	0.00055	0.0400	-	7 592	7 173	-	-	0.016	--	--
Ammonia nitrogen	mg N/L	2.1	4	2.1	-	-1	-41	-	-	1.83	--	16
Dissolved Arsenic	mg/L	0.0024	0.0680	0.0015	-	-38	-98	-	-	0.005	0.5	0.3
Chloride	mg/L	620	630	17	-	-97	-97	-	-	120	--	1000
Dissolved Copper	mg/L	0.0014	0.016	0.0007	-	-50	-96	-	-	0.002	0.3	0.1
Fluoride	mg/L	0.19	0.24	0.29	-	53	21	-	-	0.12	--	--
Hardness	mg CaCO3/L	300	310	193	-	-36	-38	-	-	--	--	--
Dissolved Lead	mg/L	0.0016	0.0076	0.0002	-	-91	-98	-	-	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.003	0.093	0.0187	-	545	-80	-	-	0.025	0.5	0.2
Dissolved Barium	mg/L	0.041	0.0630	0.0107	-	-74	-83	-	-	--	--	--
Dissolved Cadmium	mg/L	0.000076	0.00027	0.0001	-	-21	-78	-	-	0.00004	--	0.002
Dissolved Iron	mg/L	0.37	4.60	0.0050	-	-99	-100	-	-	0.3	--	--
Dissolved Mercury	mg/L	0.0000059	0.0000540	0.00001	-	-15	-91	-	-	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.19	0.86	0.1187	-	-38	-82	-	-	0.23	--	--
Dissolved Molybdenum	mg/L	0.013	0.013	0.0202	-	55	55	-	-	0.073	--	--
Dissolved Selenium	mg/L	0.0003	0.0012	0.0010	-	245	-17	-	-	0.001	--	--
Dissolved Thallium	mg/L	0.00003	0.00012	0.0004	-	1 190	233	-	-	0.0008	--	--
Nitrate	mgN/L	2.30	4.00	6.88	-	199	72	-	-	2.94	--	20
Sulphate	mg/L	31	46	133	-	329	189	-	-	128	--	--
Total dissolved solids	mg/L	960	990	318	-	-67	-68	-	-	--	--	--
Dissolved Zinc	mg/L	0.0076	0.0850	0.0005	-	-93	-99	-	-	0.013	0.5	0.4

North Portage Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 4*	Possible Poor end Scenario Predicted Model Year 4*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile*		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to 3PL**
				Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor			
pH		6.30	6.10	-	-	-	-	-	-	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	0.05	2.4	61	-	121 900	2 442	-	-	--	--	--
Ammonia (unionized)	mg N/L	0.003	0.0014	0.0300	-	900	2 043	-	-	0.016	--	--
Ammonia nitrogen	mg N/L	12	8.9	1.8	-	-85	-80	-	-	1.83	--	16
Dissolved Arsenic	mg/L	0.00005	0.056	0.0003	-	456	-100	-	-	0.005	0.5	0.3
Chloride	mg/L	0.0010	0.25	17	-	1 683 573	6 500	-	-	120	--	1000
Dissolved Copper	mg/L	0.00001	0.007	0.0014	-	12 627	-80	-	-	0.002	0.3	0.1
Fluoride	mg/L	0.000008	0.031	0.25	-	3 124 900	706	-	-	0.12	--	--
Hardness	mg CaCO3/L	0.05	8	166	-	368 789	1 975	-	-	--	--	--
Dissolved Lead	mg/L	0.000002	0.0029	0.0002	-	6 718	-95	-	-	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.00003	0.043	0.0222	-	65 194	-48	-	-	0.025	0.5	0.2
Dissolved Barium	mg/L	0.00002	0.013	0.0093	-	48 847	-28	-	-	--	--	--
Dissolved Cadmium	mg/L	0.0000006	0.000099	0.0001	-	8 233	-49	-	-	0.00004	--	0.002
Dissolved Iron	mg/L	0.000097	2.1	0.0100	-	10 209	-100	-	-	0.3	--	--
Dissolved Mercury	mg/L	0.000000056	0.000029	0.00001	-	8 829	-83	-	-	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.0002	0.22	0.1250	-	83 233	-43	-	-	0.23	--	--
Dissolved Molybdenum	mg/L	0.000004	0.00081	0.0230	-	574 900	2 740	-	-	0.073	--	--
Dissolved Selenium	mg/L	0.000003	0.00058	0.0010	-	33 233	72	-	-	0.001	--	--
Dissolved Thallium	mg/L	0.0000014	0.000057	0.0008	-	57 043	1 304	-	-	0.0008	--	--
Nitrate	mgN/L	13	10.00	6.03	-	54	-40	-	-	2.94	--	20
Sulphate	mg/L	0.011	8.8	130	-	1 181 718	1 377	-	-	128	--	--
Total dissolved solids	mg/L	28	41	303	-	982	639	-	-	--	--	--
Dissolved Zinc	mg/L	0.000032	0.037	0.0010	-	3 025	-97	-	-	0.013	0.5	0.4

Footnotes:

Highlighted values represent exceedences of greater than 20% relative percent difference between predicted vs measured values.

* Used year 7 predictions for Vault, year 3 for Goose and year 4 for Portage which represent pits in operation as presented in Golder, 2007 - Water Quality Predictions Meadowbank Gold Project Doc No 516, Ver 0

4 Some have no lower 25th percentile data as only 1 or 2 samples were taken in 2018.

** Discharge criteria and guidelines based on total metal concentrations. Sulphate guideline based on threshold value from BC Environment guideline for the protection of aquatic life for very soft water (0-30 mg/L) (April 2013).

Highlighted values in yellow indicate a mean measured value greater than the discharge criteria or guidelines.

2019 Comparison of predicted pit water quantity and quality to the measured water quantity and quality LIFE OF MINE YEAR 10

Water Quantity* (SURFACE RUNOFF & INFILTRATION)

Pits**	Predicted (m³)	Measured (m³)	% Difference between predicted vs measured	Predicted Model Year
Portage	167 478	289 269	73	2019
Bay Goose	343 567	327 114	-5	2019
Vault Pit*	350 800	326 350	-7	^ and **

*Predicted volumes from August 2007 - Waste and Water Management Plan - Meadowbank Gold Project, Table 12.2, Year 7 and include runoff to Vault Pit and other drainage area. In Year 10, the pits in vault area are naturally refilling.

**For year 10, for Vault, use the runoff estimated in Figure 12-9. For Portage and Bay Goose, values include surface runoff and infiltration into the pit based on the water balance considered in the CRPR update area.

Vault Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 8*	Possible Poor end Scenario Predicted Model Year 8*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to Wally Lake**
				Mean	Lower 25th centile*	Probable	Possible Poor	Probable	Possible Poor			
pH		6.70	6.80	8.00	7.97	19	18	19	17	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	5.3	7.4	6.3	5.7	1 089	751	975	670	0.16	--	--
Ammonia (unionized)	mg N/L	0.0043	0.0091	0.030	0.020	6 877	3 147	4 551	2 098	0.16	--	--
Ammonia nitrogen	mg N/L	0.71	1.20	1.18	66	-2	-33	1.83	--	--	20	
Dissolved Arsenic	mg/L	0.0014	0.016	0.0039	0.0037	2 710	-75	2 507	-77	0.005	0.5	0.1
Chloride	mg/L	0.3200	0.320	11	3 306	3 306	2 588	2 588	120	--	--	500
Dissolved Copper	mg/L	0.0034	0.0056	0.0023	0.0020	586	317	474	248	0.002	0.3	0.1
Fluoride	mg/L	0.023	0.026	0.17	0.16	854	567	596	515	0.12	--	--
Hardness	mg CaCO3/L	6.70	1	187	158	2 845	17 839	2 251	14 218	--	--	--
Dissolved Lead	mg/L	0.0020	0.0020	0.0020	0.0020	25	25	25	25	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.00030	0.00032	0.0036	0.0033	1 100	1 025	1 000	931	0.025	0.5	0.2
Dissolved Barium	mg/L	0.004500	0.011	0.0250	0.0232	456	128	416	111	--	--	--
Dissolved Cadmium	mg/L	0.000110	0.00014	0.00001	0.00001	-9	-29	-9	-29	0.00004	--	0.002
Dissolved Iron	mg/L	0.000000	0.00000	0.0050	0.0050	-32	-36	-32	-36	0.3	--	--
Dissolved Mercury	mg/L	0.00002000	0.00001	0.00001	0.00001	-77	-80	-77	-80	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.000330	0.00100	0.0545	0.0491	16 415	5 350	14 779	4 810	0.23	--	--
Dissolved Molybdenum	mg/L	0.000290	0.00040	0.0467	0.0359	10 033	397	12 279	292	0.073	--	--
Dissolved Selenium	mg/L	0.000200	0.00038	0.0003	0.0003	14	-34	14	-34	0.001	--	--
Dissolved Tellurium	mg/L	0.000040	0.00050	0.0001	0.0001	127	100	127	100	0.0008	--	--
Nitrate	mgN/L	0.76	1.3	7.45	5.63	880	473	640	333	2.34	--	50
Sulphate	mg/L	2.40	4.6	134	104	5 464	2 803	4 225	2 167	1.26	--	--
Total dissolved solids	mg/L	1.3	21	312	273	23 926	1 387	20 900	1 200	--	--	--
Dissolved Zinc	mg/L	0.0013	0.00140	0.0012	0.0008	-10	-17	-42	-46	0.013	0.5	0.2

Phaser Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 8*	Possible Poor end Scenario Predicted Model Year 8*	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to Wally Lake**
				Mean	Lower 25th centile*	Probable	Possible Poor	Probable	Possible Poor			
pH		6.70	6.80	7.48	7.10	12	10	6	4	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	5.300	7.4	46	43	775	527	711	481	0.16	--	--
Ammonia (unionized)	mg N/L	0.0043	0.0091	0.0280	0.0200	6 412	2 977	4 551	2 098	0.16	--	--
Ammonia nitrogen	mg N/L	0.71	1.20	1.18	46	-87	-87	1.86	-89	0.005	0.5	0.1
Dissolved Arsenic	mg/L	0.0014	0.016	0.0021	0.0018	1 429	-87	1 186	-89	0.005	0.5	0.1
Chloride	mg/L	0.3200	0.320	3	3	856	856	775	775	120	--	500
Dissolved Copper	mg/L	0.0034	0.0056	0.0045	0.0040	1 288	707	1 049	586	0.002	0.3	0.1
Fluoride	mg/L	0.023	0.026	0.13	0.11	448	385	378	323	0.12	--	--
Hardness	mg CaCO3/L	6.70	1	100	91	1 396	9 009	1 258	8 173	--	--	--
Dissolved Lead	mg/L	0.002000	0.0020	0.002	0.002	25	25	25	25	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.00032	0.00032	0.0032	0.0032	1 544	1 544	1 567	1 463	0.025	0.5	0.2
Dissolved Barium	mg/L	0.004500	0.011	0.0203	0.0174	351	84	287	58	--	--	--
Dissolved Cadmium	mg/L	0.000110	0.00014	0.00001	0.00001	9	-14	-9	-29	0.00004	--	0.002
Dissolved Iron	mg/L	0.000000	0.00000	0.0050	0.0050	-32	-36	-32	-36	0.3	--	--
Dissolved Mercury	mg/L	0.00002000	0.00001	0.00001	0.00001	-77	-80	-77	-80	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.000330	0.00100	0.0839	0.0726	25 312	8 286	21 900	7 160	0.23	--	--
Dissolved Molybdenum	mg/L	0.000290	0.00040	0.0107	0.0078	3 576	13	2 590	-17	0.073	--	--
Dissolved Selenium	mg/L	0.000200	0.00038	0.0003	0.0003	100	16	14	-36	0.001	--	--
Dissolved Tellurium	mg/L	0.000040	0.00050	0.0001	0.0001	127	100	127	100	0.0008	--	--
Nitrate	mgN/L	0.76	1.3	3.3	2.1	332	162	179	63	2.34	--	50
Sulphate	mg/L	2.40	4.6	59	51	2 340	1 173	2 429	1 220	1.26	--	--
Total dissolved solids	mg/L	1.3	21	174	133	13 300	750	13 051	719	--	--	--
Dissolved Zinc	mg/L	0.0013	0.00140	0.0005	0.0005	-62	-64	-62	-64	0.013	0.5	0.2

Goose Island Pit Lake Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 3*	Possible Poor end Scenario Predicted Model Year 3*	Annual Average Water Quality Forecast Value Model Year 2019***	Lower 25th Centile Water Quality Forecast Value***	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile*		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile*		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to 3PL**
						Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor	Annual Average	Lower 25th centile	Annual Average	Lower 25th centile			
pH		6.1	6.1	73	71	81	--	126	126	--	--	-16	-15	--	--	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	27	0	0.3000	0.3000	81	--	57 043	57 043	--	--	-16	-15	--	--	0.16	--	--
Ammonia (unionized)	mg N/L	0	0	28	27	10.5	--	94	94	--	--	-63	-61	--	--	1.83	--	16
Dissolved Arsenic	mg/L	0.002	0.002	0.011	0.011	0.0146	--	813	813	--	--	-28	-32	--	--	0.005	0.5	0.3
Chloride	mg/L	440	440	153	148	80	--	42	42	--	--	-48	-46	--	--	120	--	1000
Dissolved Copper	mg/L	0.001	0.001	0.861	0.820	0.3543	--	37 195	37 195	--	--	-58	-57	--	--	0.002	0.3	0.1
Fluoride	mg/L	0.130	0.130	0.630	0.613	0.54	--	315	315	--	--	-14	-12	--	--	0.12	--	--
Hardness	mg CaCO3/L	210	210	561	543	405	--	930	930	--	--	-28	-25	--	--	--	--	--
Dissolved Lead	mg/L	0.0011	0.0011	0.0003	0.0003	0.0002	--	65	65	--	--	-54	-54	--	--	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.002	0.002	0.015	0.015	0.0150	--	950	950	--	--	-2	0	--	--	0.025	0.5	0.2
Dissolved Barium	mg/L	0.027	0.027	0.050	0.048	0.0303	--	12	12	--	--	-39	-37	--	--	--	--	--
Dissolved Cadmium	mg/L	0.000	0.000	0.000	0.000	0.0000	--	-80	-80	--	--	-95	-94	--	--	0.00004	--	0.002
Dissolved Iron	mg/L	0.000	0.000	0.384	0.371	0.0050	--	-98	-98	--	--	-99	-99	--	--	0.3	--	--
Dissolved Mercury	mg/L	0.000	0.000	0.000	0.000	0.0001	--	28	28	--	--	-78	-77	--	--	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.1300	0.1300	0.1026	0.0905	0.0309	--	-76	-76	--	--	-70	-66	--	--	0.23	--	--
Dissolved Molybdenum	mg/L	0.000	0.000	0.0281	0.0280	0.0255	--	1 092	1 092	--	--	-64	-63	--	--	0.073	--	--
Dissolved Selenium	mg/L	0.002	0.002	0.0535	0.0516	0.0015	--	650	650	--	--	-97	-97	--	--	0.001	--	--
Dissolved Tellurium	mg/L	0.0000	0.0000	0.0012	0.0011	0.0001	--	400	400	--	--	-92	-91	--	--	0.0008	--	--
Nitrate	mgN/L	4.0	4.0	4.8	4.6	1.90	--	-53	-53	--	--	-60	-59	--	--	2.94	--	20
Sulphate	mg/L	271	271	1 079	1 009	469	--	2 133	2 133	--	--	-76	-75	--	--	1.26	--	--
Total dissolved solids	mg/L	670	670	1 996	1 932	803	--	20	20	--	--	-60	-58	--	--	--	--	--
Dissolved Zinc	mg/L	0.0051	0.0051	0.0038	0.0035	0.0005	--	-80	-80	--	--	-87	-86	--	--	0.013	0.5	0.4

Third Portage Pit Sumps Water Quality (Pit E)

Parameters	Units	Probable Scenario Predicted Model Year 4*	Possible Poor end Scenario Predicted Model Year 4*	Annual Average Water Quality Forecast Value for Model Year 2019***	Lower 25th Centile Water Quality Forecast Value***	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile*		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile*		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to 3PL**		
						Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor	Annual Average	Lower 25th centile	Annual Average	Lower 25th centile				Long Term, Based on 3PL quality	Max. Monthly Mean
pH		6.3	6.1	43	43	158	125	7.69	7.62	22	20	21	25	-62	-62	-71	-63	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	40	43	158	125	7.69	46	51	51	40	40	21	25	-62	-62	-71	-63	0.16	--	--
Ammonia (unionized)	mg N/L																			

**2019 Comparison of predicted pit water quantity and quality to the measured water quantity and quality
LIFE OF MINE YEAR 10**

North Portage Pit Sumps Water Quality (Pit A)

Parameters	Units	Probable Scenario Predicted Model Year 4*	Possible Poor end Scenario Predicted Model Year 4*	Annual Average Water Quality Forecast Value Model Year 2019 ***	Lower 25% Centile Water Quality Forecasted Value***	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile *		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower		CCME Guideline s**	MMER Schedule 4**	Water License Discharge
						Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor	Annual Average	Lower 25th centile	Annual Average	Lower 25th centile			
pH		6.3	6.1			7.84	-	24	28	-	-	44	73	-	-	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity	mg CaCO3/L	0	2	49	41	70	-	139 900	2 817	-	-	-	-	-	-	-	-	-
Ammonia (unionized)	mg N/L	0.0	0.0			0.1050	-	3 400	7 490	-	-	-	-	-	-	0.016	-	-
Ammonia nitrogen	mg/L	12	9	19	17	6.7	-	44	24	-	-	-85	-60	-	-	1.63	-	16
Dissolved Arsenic	mg/L	0.000	0.056	0.008	0.007	0.2721	-	604 567	385	-	-	3 318	3 731	-	-	0.005	0.5	0.3
Chloride	mg/L	0	0	106	96	162	-	16 479 452	64 500	-	-	53	68	-	-	120	-	1000
Dissolved Copper	mg/L	0.000	0.007	0.530	0.434	0.0249	-	225 809	255	-	-	-95	-84	-	-	0.002	0.3	0.1
Fluoride	mg/L	0.000	0.031	0.404	0.325	0.35	-	4 687 400	1 110	-	-	-7	15	-	-	0.12	-	-
Hardness	mg CaCO3/L	0	8	351	285	631	-	1 401 011	7 781	-	-	80	121	-	-	-	-	-
Dissolved Lead	mg/L	0.0000	0.0029	0.0002	0.0002	0.0002	-	6 718	-95	-	-	-37	-28	-	-	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.000	0.043	0.010	0.009	0.0640	-	188 135	49	-	-	513	627	-	-	0.025	0.5	0.2
Dissolved Barium	mg/L	0.000	0.013	0.032	0.026	0.0273	-	143 694	110	-	-	-14	4	-	-	-	-	-
Dissolved Cadmium	mg/L	0.000	0.009	0.000	0.000	0.0001	-	18 233	11	-	-	4	41	-	-	0.00004	-	0.002
Dissolved Iron	mg/L	0.000	2 100	0.245	0.199	0.0625	-	64 333	-97	-	-	-74	-69	-	-	0.3	-	-
Dissolved Mercury	mg/L	0.0000	0.0000	0.0000	0.0000	0.0001	-	8 829	-83	-	-	-71	-68	-	-	0.000028	-	0.0004
Dissolved Manganese	mg/L	0.0002	0.2200	0.0627	0.0450	0.8817	-	587 667	301	-	-	1 306	1 861	-	-	0.23	-	-
Dissolved Molybdenum	mg/L	0.0000	0.0008	0.1792	0.1464	0.1533	-	3 831 150	18 820	-	-	-14	5	-	-	0.073	-	-
Dissolved Selenium	mg/L	0.0000	0.0006	0.0328	0.0264	0.0075	-	249 900	1 193	-	-	-77	-72	-	-	0.001	-	-
Dissolved Thallium	mg/L	0.0000	0.0001	0.0007	0.0004	0.0001	-	7 043	75	-	-	-85	-75	-	-	0.0008	-	-
Nitrate	mg/L	13.0	10.0	3.5	3.2	4.59	-	-65	-54	-	-	31	43	-	-	2.84	-	20
Sulphate	mg/L	0	9	1342	1199	916	-	8 322 627	10 303	-	-	-32	-24	-	-	128	-	-
Total dissolved solids	mg/L	29	41	1374	1240	1391	-	4 656	3 281	-	-	1	12	-	-	-	-	-
Dissolved Zinc	mg/L	0.0000	0.0370	0.0035	0.0033	0.0005	-	1 463	-99	-	-	-86	-85	-	-	0.013	0.5	0.4

Footnotes:

- Highlighted values represent exceedences of greater than 20% relative percent difference between predicted vs measured values.
 - * Used year 8 predictions for Vault for 1st year of pit flooding, year 3 for Goose and year 4 for Portage which represent pits in operation as presented in Golder, 2007 - Water Quality Predictions Meadowbank Gold Project Doc No 516, Ver 0
 - ** Discharge criteria and guidelines based on total metal concentrations. Sulphate guideline based on threshold value from BC Environment guideline for the protection of aquatic life for very soft water (0-30 mg/L) (April 2013).
 - *** Annual average water quality and 25% centile values shown in this table are based on the water quality forecast considered in the Meadowbank Interim Closure and Reclamation Plan - Update 2019, Doc. No. 862987-5000-4EER-0001, rev. 00.
 - † Some have no lower 25th percentile data as only 1 or 2 samples were taken in 2019.
- Highlighted values in yellow indicate a mean measured value greater than the discharge criteria or guidelines.

**2020 Comparison of predicted pit water quantity and quality to the measured water quantity and quality
LIFE OF MINE YEAR 11**

Water Quantity (SURFACE RUNOFF & INFILTRATION)

Pit	Predicted (m³)	Measured (m³)	% Difference between predicted vs measured	Predicted Model Year
Portage**	167 616	302 500	80	2020
Bay Goose**	344 535	389 350	13	A
Vault Pit*	350 800	326 350	-7	2020

*Predicted volumes from August 2007 "Waste and Water Management Plan - Meadowbark Gold Project, Table 12.2, Year 7 and include runoff to Vault Pit and other drainage area. In Year 11, the pits in Vault area are naturally refilling. For Year 11, for Vault, use the runoff estimated in Table 12.2
**For Portage and Bay Goose, values include surface runoff and infiltration into the pit based on the water balance considered in the ICRP update 2019.

Vault Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 9*	Possible Poor end Scenario Predicted Model Year 9*	Measured		% Difference between predicted vs measured - mean		% Difference between predicted vs measured - Lower 25th percentile		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to Wally Lake**
				Mean	Lower 25th centile*	Probable	Possible Poor	Probable	Possible Poor			
pH		6.70	6.80	7.97	7.92	19	17	16	16	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity (un-ionized)	mg CaCO3/L	8.2	10	56	46	571	450	461	360			
Ammonia (un-ionized)	mg N/L	0.00018	0.00038	0.0100	0.0100	5 456	2 532	5 456	2 532	0.016	--	--
Ammonia nitrogen	mg N/L	0.3	0.49	0.15	0.12	-81	-70	-60	-76	1.83	--	20
Dissolved Arsenic	mg/L	0.00021	0.0015	0.0034	0.0030	1 510	-77	1 329	-90	0.005	0.5	0.1
Chloride	mg/L	0.4900	0.510	8	8	1 590	1 524	1 594	1 627	120	--	500
Dissolved Copper	mg/L	0.0004900	0.00070	0.0014	0.0005	178	94	2	-29	0.002	0.3	0.1
Fluoride	mg/L	0.0340000	0.037	0.10	0.09	206	181	165	143	0.12	--	--
Hardness	mg CaCO3/L	11	110	111	980	692	909	640				
Dissolved Lead	mg/L	0.00019000	0.000190	0.0002	0.0002	17	17	-11	-11	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.00040	0.00047	0.0015	0.0014	226	228	216	198	0.025	0.5	0.2
Dissolved Barium	mg/L	0.0007400	0.011	0.0110	0.0098	48	0	32	-11			
Dissolved Cadmium	mg/L	0.0000180	0.000021	0.00002	0.00002	11	-5	11	-5	0.00004	--	0.002
Dissolved Iron	mg/L	0.0100	0.012	0.0100	0.0100	-17	-17	-17	-17	0.3	--	--
Dissolved Mercury	mg/L	0.000029000	0.000032	0.00001	0.00001	-66	-69	-66	-69	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.000450	0.00110	0.0026	0.0026	2 380	915	478	136	0.23	--	--
Dissolved Molybdenum	mg/L	0.0004200	0.00030	0.0188	0.0128	4 381	102	2 948	38	0.073	--	--
Dissolved Selenium	mg/L	0.0003600	0.00011	0.0010	0.0010	200	198	178	92	0.001	--	--
Dissolved Thallium	mg/L	0.0000720	0.000078	0.0002	0.0002	178	156	178	156	0.0008	--	--
Nitrate	mg/L	0.31	0.52	2.23	1.80	619	328	481	246	2.94	--	50
Sulphate	mg/L	3.80	45	1 255	929	1 084	650	128				
Total dissolved solids	mg/L	19	25	101	109	558	400	439	304			
Dissolved Zinc	mg/L	0.002000	0.00210	0.0010	0.0010	-50	-52	-50	-52	0.013	0.5	0.2

Phaser Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 9*	Possible Poor end Scenario Predicted Model Year 9*	Measured		% Difference between predicted vs measured - mean		% Difference between predicted vs measured - Lower 25th percentile		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to Wally Lake**
				Mean	Lower 25th centile*	Probable	Possible Poor	Probable	Possible Poor			
pH		6.70	6.80	7.75	7.56	16	14	13	11	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity (un-ionized)	mg CaCO3/L	8.2	10	40	28	382	296	241	180			
Ammonia (un-ionized)	mg N/L	0.00038	0.00038	0.0100	0.0100	5 456	2 532	5 456	2 532	0.016	--	--
Ammonia nitrogen	mg N/L	0.3	0.49	0.1	0.0	-88	-88	-87	-92	1.83	--	20
Dissolved Arsenic	mg/L	0.00021	0.0015	0.0010	0.0007	392	-83	233	-95	0.005	0.5	0.1
Chloride	mg/L	0.4900	0.510	2	2	270	255	165	155			500
Dissolved Copper	mg/L	0.00049000	0.00070	0.0018	0.0009	285	156	84	29	0.002	0.3	0.1
Fluoride	mg CaCO3/L	0.037	0.08	0.06	0.06	129	110	76	62	0.12	--	--
Hardness	mg CaCO3/L	11	110	98	602	415	590	340				
Dissolved Lead	mg/L	0.000190000	0.000190	0.0002	0.0002	20	-11	-11	-11	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.00040	0.00047	0.0034	0.0023	665	616	423	389	0.025	0.5	0.2
Dissolved Barium	mg/L	0.00074000	0.011	0.0095	0.0057	28	-14	-23	-48			
Dissolved Cadmium	mg/L	0.0000180	0.000021	0.00002	0.00002	11	-5	-5	-5	0.00004	--	0.002
Dissolved Iron	mg/L	0.012000	0.011	0.0110	0.0100	-7	-7	-7	-7	0.3	--	--
Dissolved Mercury	mg/L	0.000029000	0.000032	0.00001	0.00001	-66	-69	-66	-69	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.000450	0.00110	0.0213	0.0095	4 628	1 834	11	-55	0.23	--	--
Dissolved Molybdenum	mg/L	0.0004200	0.00030	0.0035	0.0018	726	63	329	-81	0.073	--	--
Dissolved Selenium	mg/L	0.00036000	0.00052	0.0009	0.0010	162	82	178	92	0.001	--	--
Dissolved Thallium	mg/L	0.0000720	0.000078	0.0002	0.0002	178	156	178	156	0.0008	--	--
Nitrate	mg/L	0.31	0.52	2.23	1.80	619	328	481	246	2.94	--	50
Sulphate	mg/L	3.80	45	1 255	929	1 084	650	128				
Total dissolved solids	mg/L	19	25	101	109	558	400	439	304			
Dissolved Zinc	mg/L	0.002000	0.00210	0.0010	0.0010	-50	-52	-50	-52	0.013	0.5	0.2

Goose Island Pit Lake Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 3*	Possible Poor end Scenario Predicted Model Year 3*	Annual Average Water Quality Forecast Value Model Year 2020***	Lower 25th Centile Quality Forecasted Value***	Measured		% Difference between predicted vs measured - mean		% Difference between predicted vs measured - Lower 25th percentile*		% Difference between predicted vs measured - mean		% Difference between predicted vs measured - Lower 25th percentile*		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to 3PL*
						Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor	Annual Average	Lower 25th centile					
														Annual Average	Lower 25th centile			
pH		6.1	6.1			7.99	7.83			133	133	90	249	47	171			
Alkalinity (un-ionized)	mg CaCO3/L	27	27	43	23	81	83	201	201	512	512	45 436	45 436					
Ammonia (un-ionized)	mg N/L	0	0	0.5914	0.2550	105 512	105 512	45 436	45 436									
Ammonia nitrogen	mg N/L	5	5	11	4	19.2	10.7	256	256	97	97	69	387	-7	169	4.83	--	16
Dissolved Arsenic	mg/L	0.0002	0.002	0.006	0.004	0.5745	0.5305	41 868	41 868	26 206	26 206	13 333	32 437	8 512	20 760	0.005	0.5	0.3
Chloride	mg/L	440	440	63	23	193	109	56	56	-75	-75	203	749	72	382	120	--	1000
Dissolved Copper	mg/L	0.001	0.001	0.345	0.119	0.5868	0.1176	61 671	61 671	12 274	12 274	70	392	-66	-2	0.002	0.3	0.1
Fluoride	mg/L	0.130	0.130	0.326	0.171	0.25	0.26	95	95	90	90	52	48	-22	48	0.12	--	--
Hardness	mg CaCO3/L	210	210	247	96	834	817	834	829	289	287	749	235	766	34			
Dissolved Lead	mg/L	0.0001	0.0002	0.0001	0.0001	0.0001	0.0001	-89	-89	-92	-92	-49	-7	-65	-39	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.002	0.002	0.007	0.003	0.1343	0.0997	6 616	6 616	4 885	4 885	1 713	4 181	1 246	3 077	0.025	0.5	0.2
Dissolved Barium	mg/L	0.0000180	0.000021	0.00002	0.00002	0.00002	0.00002	66	66	6	6	104	336	19	153			
Dissolved Cadmium	mg/L	0.000	0.000	0.000	0.000	0.0000	0.0000	-80	-80	-80	-80	-94	-90	-94	-90	0.00004	--	0.002
Dissolved Iron	mg/L	0.250	0.250	0.167	0.063	0.0050	0.0050	-98	-98	-98	-98	-92	-92	-92	-92	0.3	--	--
Dissolved Mercury	mg/L	0.0000	0.0000	0.0000	0.0000	0.00001	0.00001	120	120	28	28	-58	-28	-75	-58	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.1300	0.1300	0.145	0.0648	0.0245	0.0168	-81	-81	-87	-87	-62	-85	-74	0.23	--	--	
Dissolved Molybdenum	mg/L	0.0086	0.0086	0.1195	0.0421	0.0808	0.0552	839	839	541	541	-32	92	-54	31	0.073	--	--
Dissolved Selenium	mg/L	0.0002	0.0002	0.0027	0.0075	0.0326	0.0206	16 221	16 221	10 150	10 150	50	333	-6	172	0.001	--	--
Dissolved Thallium	mg/L	0.0000	0.0000	0.0005	0.0009	0.0001	0.0001	-600	-600	-600	-600	-83	-88	-	0.0008	--	--	
Nitrate	mg/L	4.0	4.0	2.0	0.7	3.96	2.66	-1	-1	-34	-34	102	464	35	278	2.94	--	20
Sulphate	mg/L	21	21	819	290	824	561	3 822	3 822	2 571	2 571	1	184	-32	93	128	--	--
Total dissolved solids	mg/L	670	670	654	335	1316	1006	96	96	50	50	46	293	14	200			
Dissolved Zinc	mg/L	0.0051	0.0051	0.0040	0.0025	0.0005	0.0005	-90	-90	-90	-90	-88	-80	-88	-80	0.013	0.5	0.4

Third Portage Pit Sumps Water Quality (Pit E)

Parameters	Units	Probable Scenario Predicted Model Year 4*	Possible Poor end Scenario Predicted Model Year 4*	Annual Average Water Quality Forecast Value Model Year 2020***	Lower 25th Centile Quality Forecasted Value***	Measured		% Difference between predicted vs measured - mean		% Difference between predicted vs measured - Lower 25th percentile*		% Difference between predicted vs measured - mean		% Difference between predicted vs measured - Lower 25th percentile*		CCME Guidelines**	MMER Schedule 4**	Water License Discharge to 3PL*
						Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor	Annual Average	Lower 25th centile					
														Annual Average</				

**2020 Comparison of predicted pit water quantity and quality to the measured water quantity and quality
LIFE OF MINE YEAR 11**

North Portage Pit Sumps Water Quality (Pit A)

Parameters	Units	Probable Scenario Year 4*	Possible Poor end Scenario Year 4*	Annual Average Water Quality Forecast Value Model Year 2020***	Lower 25% Centile Water Quality Forecasted Value***	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile *		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile *		CCME Guidelines**	MMEr Schedule 4**	Water License Discharge to 3PL**
						Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor	Annual Average	Lower 25th centile	Annual Average	Lower 25th centile			
pH		6.3	6.1			8.29	7.80	32	36	25	30			#DIV/0!	#DIV/0!			6.0 to 9.0
Alkalinity	mg CaCO ₃ /L	0.05	2.40	67	58	91	63	182 233	3 699	125 900	2 525	36	58	4	9			6.0 to 9.0
Ammonia (unionized)	mg N/L	0.003	0.001			0.3085	0.2625	10 183	21 936	8 650	18 650					0.016	--	--
Ammonia nitrogen	mg N/L	12	9	20	18	13.1	12.9	9	47	6	45	-34	-27			1.83	--	16
Dissolved Arsenic	mg/L	0.000	0.006	0.180	0.009	0.3454	0.3348	767 419	517	743 955	498	92	3 739	86	3 622	0.005	0.5	0.3
Chloride	mg/L	0	0	108	96	324	331	12 698 880	49 680	13 400 410	52 430	15	29	21	37	120	--	1000
Dissolved Copper	mg/L	0.000	0.007	0.657	0.629	0.3274	0.1324	2 976 112	4 577	1 203 309	1 791	-50	-48	-80	-79	0.002	0.3	0.1
Fluoride	mg/L	0.000	0.631	0.437	0.400	0.25	0.17	3 124 900	706	2 156 150	465	-43	-37	-61	-57	0.12	--	--
Hardness	mg CaCO ₃ /L	0	9	542	423	610	608	1 354 344	7 518	1 350 456	7 697	12	44	12	44	--	--	--
Dissolved Lead	mg/L	0.0000	0.0029	0.0005	0.0003	0.0004	0.0001	17 741	-86	3 764	-97	-25	43	-84	-69	0.001	0.2	0.1
Dissolved Nickel	mg/L	0.000	0.043	0.015	0.012	0.0919	0.0755	270 047	114	221 885	76	498	644	381	511	0.025	0.5	0.2
Dissolved Barium	mg/L	0.000	0.013	0.065	0.038	0.0463	0.0431	254 023	271	226 874	232	-29	27	-34	13	--	--	--
Dissolved Cadmium	mg/L	0.000	0.000	0.000	0.000	0.0000	0.0000	1 567	-90	1 567	-91	-89	-89	-91	-89	0.00004	--	0.002
Dissolved Iron	mg/L	0.000	2.100	0.671	0.294	0.0167	0.0050	17 082	-99	5 055	-100	-97	-94	-99	-98	0.3	--	--
Dissolved Mercury	mg/L	0.0000	0.0000	0.0000	0.0000	0.00001	0.00001	8 829	-83	8 829	-83	-74	-74	-74	-73	0.00026	--	0.0004
Dissolved Manganese	mg/L	0.0002	0.2200	0.0924	0.0827	0.2039	0.1035	135 811	-7	68 917	-53	121	147	12	25	0.23	--	--
Dissolved Molybdenum	mg/L	0.0000	0.0008	0.1863	0.1639	0.0898	0.0714	2 243 650	10 980	1 785 525	8 718	-52	-45	-62	-56	0.073	--	--
Dissolved Selenium	mg/L	0.0000	0.0006	0.0320	0.0248	0.0188	0.0140	626 289	3 140	466 567	2 314	-41	-24	-56	-44	0.001	--	--
Dissolved Thallium	mg/L	0.0000	0.0001	0.0009	0.0008	0.0003	0.0001	18 948	388	7 043	75	-69	-86	-87	0.0008	--	--	
Nitrate	mg/L	13.0	10.0	3.6	3.3	2.82	2.71	-78	-79	-73	-21	-14	-24	-18	2.94	--	20	
Sulphate	mg/L	0	9	1583	1505	720	592	6 544 597	8 081	5 377 173	6 622	-55	-52	-63	-61	1.25	--	--
Total dissolved solids	mg/L	28	41	1710	1542	1120	1063	3 998	2 630	3 902	2 665	-35	-27	-36	-29	--	--	--
Dissolved Zinc	mg/L	0.0000	0.0370	0.0039	0.0037	0.0005	0.0005	1 463	-99	1 463	-99	-87	-86	-87	-86	0.013	0.5	0.4

Footnotes:

- Highlighted values represent exceedences of greater than 20% relative percent difference between predicted vs measured values.
- * Used year 9 predictions for Vault for 2nd year of pit flooding, year 3 for Goose and year 4 for Portage which represent pits in operation as presented in Golder, 2007 - Water Quality Predictions Meadowbank Gold Project Doc No 516, Ver 0
- ** Discharge criteria and guidelines based on total metal concentrations. Sulphate guideline based on threshold value from BC Environment guideline for the protection of aquatic life for very soft water (0-30 mg/L) (April 2013).
- *** Annual average water quality and 25% centile values shown in this table are based on the water quality forecast considered in the Meadowbank Interim Closure and Reclamation Plan - Update 2018, Doc. No. 662897-000-4EER-0001, rev. 00.
- + Some have no lower 25th percentile data as only 1 or 2 samples were taken in 2019.
- Highlighted values in yellow indicate a mean measured value greater than the discharge criteria or guidelines.

**2021 Comparison of predicted pit water quantity and quality to the measured water quantity and quality
LIFE OF MINE YEAR 12**

Water Quantity (SURFACE RUNOFF & INFILTRATION)

Pit	Predicted (m³)	Measured (m³)	% Difference between predicted vs measured	Predicted Model Year
Portage**	167 478	413 104	147	2021
Bay Goose**	343 657	201 289	-41	2021
Vault Pit*	350 800	326 350	-7	2021

*Predicted volumes from August 2007 "Waste and Water Management Plan: Meadowbark Gold Project, Table 12.2, Year 7 and include runoff to Vault Pit and other drainage area. In Year 12, the pits in Vault area are naturally refilling. For year 12, for Vault, use the runoff estimated in Table 12.2
**For Portage and Bay Goose, values include surface runoff and infiltration into the pit based on the water balance considered in the ICRP update 2018.

Vault Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 10*	Possible Poor end Scenario Predicted Model Year 10*	Measured		% Difference between predicted vs measured - mean		% Difference between predicted vs measured - Lower 25th percentile		CCME Guidelines**	MMER Schedule 4, Table 2**	Water License Discharge to Wally Lake**
				Mean	Lower 25th centile*	Probable	Possible Poor	Probable	Possible Poor			
pH		6.70	6.80	7.60	7.60	13	12	13	12	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity (un-ionized)	mg CaCO3/L	8.6	11	43	35	399	290	307	218	0.016	--	--
Ammonia nitrogen	mg N/L	0.00012	0.00024	0.07	0.05	-64	-77	-73	-63	1.83	--	20
Dissolved Arsenic	mg/L	0.00023	0.0016	0.0025	0.0020	995	984	774	87	0.005	0.3	0.1
Chloride	mg/L	0.5200	0.530	7	5	1 172	1 148	951	931	120	--	500
Dissolved Copper	mg/L	0.00051	0.00074	0.0010	0.0007	89	30	44	-1	0.002	0.3	0.1
Fluoride	mg/L	0.036	0.039	16	97	781	505	538	339	0.12	--	--
Hardness	mg CaCO3/L	11.00	16	81	81	527	331	454	281	0.001	0.1	0.1
Dissolved Lead	mg/L	0.0002000	0.000200	0.0002	0.0002	-15	-15	-15	-15	0.001	0.1	0.1
Dissolved Nickel	mg/L	0.00049	0.00049	0.0016	0.0016	231	217	226	213	0.025	0.5	0.2
Dissolved Barium	mg/L	0.007500	0.011	0.0119	0.0096	50	9	21	-13	--	--	--
Dissolved Cadmium	mg/L	0.000200	0.00023	0.00001	0.00001	-44	-51	-50	-57	0.00004	--	0.002
Dissolved Iron	mg/L	0.012000	0.013	0.0069	0.0067	-43	-47	-44	-49	0.3	--	--
Dissolved Mercury	mg/L	0.0003900	0.00033	0.00001	0.00001	-67	-70	-67	-70	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.000480	0.00120	0.0096	0.0014	1 983	698	204	17	0.23	--	--
Dissolved Molybdenum	mg/L	0.000450	0.01000	0.0197	0.0159	4 282	97	3 433	59	0.073	--	--
Dissolved Selenium	mg/L	0.0003900	0.0003	0.0002	0.0002	-31	-52	-43	-60	0.001	--	--
Dissolved Thallium	mg/L	0.0000770	0.000083	0.000017	0.000017	-79	-80	-78	-80	0.0008	--	--
Nitrate	mg/L	0.19	0.33	1.50	1.26	691	355	563	282	2.94	--	50
Sulphate	mg/L	4.10	6	139	119	1 108	674	976	525	128	--	--
Total dissolved solids	mg/L	20	26	139	115	597	436	476	342	--	--	--
Dissolved Zinc	mg/L	0.002100	0.00230	0.0041	0.0050	79	138	117	0.013	0.5	0.2	0.2

Phaser Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 10*	Possible Poor end Scenario Predicted Model Year 10*	Measured		% Difference between predicted vs measured - mean		% Difference between predicted vs measured - Lower 25th percentile		CCME Guidelines**	MMER Schedule 4, Table 2**	Water License Discharge to Wally Lake**
				Mean	Lower 25th centile*	Probable	Possible Poor	Probable	Possible Poor			
pH		6.70	6.80	7.79	7.75	16	15	16	14	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity (un-ionized)	mg CaCO3/L	8.6	11	34	30	294	208	248	172	0.016	--	--
Ammonia nitrogen	mg N/L	0.20	0.31	0.1	0.1	-75	-84	-74	-84	1.83	--	20
Dissolved Arsenic	mg/L	0.00023	0.0016	0.0013	0.0013	484	-92	456	-92	0.005	0.3	0.1
Chloride	mg/L	0.5200	0.530	3	2	389	380	346	337	120	--	500
Dissolved Copper	mg/L	0.0005100	0.00074	0.0027	0.0023	425	262	350	210	0.002	0.3	0.1
Fluoride	mg/L	0.0360000	0.039	8	81	527	331	454	281	0.12	--	--
Hardness	mg CaCO3/L	11.00	16	81	81	527	331	454	281	0.001	0.1	0.1
Dissolved Lead	mg/L	0.0002000	0.000200	0.0002	0.0001	-20	-20	-42	-42	0.001	0.1	0.1
Dissolved Nickel	mg/L	0.00049	0.00049	0.0032	0.0028	575	547	507	477	0.025	0.5	0.2
Dissolved Barium	mg/L	0.007500	0.011	0.0122	0.0100	54	11	27	-9	--	--	--
Dissolved Cadmium	mg/L	0.000200	0.00023	0.00002	0.00002	-5	-17	-20	-31	0.00004	--	0.002
Dissolved Iron	mg/L	0.012000	0.013	0.0062	0.0023	118	101	85	71	0.3	--	--
Dissolved Mercury	mg/L	0.0003900	0.00033	0.00001	0.00001	-67	-70	-67	-70	0.000026	--	0.0004
Dissolved Manganese	mg/L	0.000480	0.00120	0.0193	0.0122	4 095	1 508	2 555	918	0.23	--	--
Dissolved Molybdenum	mg/L	0.000450	0.01000	0.0068	0.0060	1 400	-32	1 240	-40	0.073	--	--
Dissolved Selenium	mg/L	0.0003900	0.00056	0.0002	0.0001	-55	-69	-62	-73	0.001	--	--
Dissolved Thallium	mg/L	0.0000770	0.000083	0.000008	0.000007	-90	-90	-91	-91	0.0008	--	--
Nitrate	mg/L	0.33	0.33	1.1	1.1	477	232	461	223	2.94	--	50
Sulphate	mg/L	4.10	6	35	31	741	439	662	388	128	--	--
Total dissolved solids	mg/L	20	26	95	92	377	267	358	253	--	--	--
Dissolved Zinc	mg/L	0.002100	0.00230	0.0008	0.0007	-81	-85	-85	-88	0.013	0.5	0.2

Goose Island Pit Lake Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 3*	Possible Poor end Scenario Predicted Model Year 3*	Annual Average Water Quality Forecast Value Model Year 2021***	Lower 25th Centile Water Quality Forecast Value***	Measured		% Difference between predicted vs measured - mean		% Difference between predicted vs measured - Lower 25th percentile*		CCME Guidelines**	MMER Schedule 4, Table 2**	Water License Discharge to 3PL**					
						Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor								
															Annual Average	Lower 25th centile	Long Term, Based on 3PL quality	Max. Monthly Mean	Max. Avg Conc.
pH		6.1	6.1	7.56	7.41	7.56	7.41	196	196	124	124	263	295	175	199	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0	
Alkalinity (un-ionized)	mg CaCO3/L	27	30	20	20	91	61	196	196	124	124	263	295	175	199	0.016	--	--	
Ammonia nitrogen	mg N/L	0	0	0	0	11.40	0.0000	20 257	20 257	-100	-100	638	844	495	660	1.83	--	16	
Dissolved Arsenic	mg/L	0.002	0.002	0.002	0.002	0.2441	409	1 810	21 409	21 409	11 213	11 213	19 866	23 459	10 401	12 291	0.005	0.3	0.1
Chloride	mg/L	440	440	18	14	88	56	80	80	-85	-85	390	516	267	361	120	--	1000	
Dissolved Copper	mg/L	0.001	0.001	0.001	0.001	0.0158	0.0086	1 567	1 567	808	808	-83	-78	-81	-88	0.002	0.3	0.1	
Fluoride	mg/L	0.130	0.130	0.157	0.143	0.22	0.19	66	66	46	46	54	21	33	0.12	--	--		
Hardness	mg CaCO3/L	210	210	110	110	422	338	611	611	311	311	516	267	361	120	--	--		
Dissolved Lead	mg/L	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000	-95	-95	-88	-88	-55	-55	-84	-83	0.001	0.1	0.1	
Dissolved Nickel	mg/L	0.002	0.002	0.003	0.002	0.0497	0.0386	2 386	2 386	1 731	1 731	1 697	1 989	1 223	1 438	0.025	0.5	0.2	
Dissolved Barium	mg/L	0.007	0.010	0.009	0.009	0.0341	0.023	223	223	223	223	155	168	155	168	--	--	0.0004	
Dissolved Cadmium	mg/L	0.000	0.000	0.000	0.000	0.0000	0.0000	-79	-79	-90	-90	-80	-80	-95	-95	0.00004	--	0.002	
Dissolved Iron	mg/L	0.250	0.250	0.052	0.043	0.0042	0.0020	-88	-88	-99	-99	-92	-90	-96	-95	0.3	--	--	
Dissolved Mercury	mg/L	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-34	-34	-44	-44	-99	-99	-99	-99	0.00008	--	0.0004	
Dissolved Manganese	mg/L	0.1300	0.1300	0.0672	0.0625	0.0352	0.0338	-73	-73	-74	-74	-44	-44	-50	-46	0.23	--	--	
Dissolved Molybdenum	mg/L	0.0086	0.0086	0.0332	0.0282	0.0570	0.0321	563	563	273	273	117	117	3	22	0.073	--	--	
Dissolved Selenium	mg/L	0.0002	0.0002	0.0008	0.0004	0.0255	0.0192	12 628	12 628	9 510	9 510	339	460	231	323	0.001	--	--	
Dissolved Thallium	mg/L	0.0000	0.0000	0.0009	0.0009	0.0000	0.0000	-99	-99	-99	-99	-99	-99	-99	-99	0.0008	--	--	
Nitrate	mg/L	4.0	4.0	0.5	0.4	1.71	1.08	-57	-73	-73	-73	212	292	97	147	2.94	--	20	
Sulphate	mg/L	21	21	228	181	654	551	3 012	3 012	2 521	2 521	188	261	141	204	128	--	--	
Total dissolved solids	mg/L	670	670	232	197	675	64	64	64	31	31	289	373	211	277	--	--	--	
Dissolved Zinc	mg/L	0.0051	0.0051	0.0026	0.0024	0.0013	0.0004	-74	-74	-82	-82	-48	-45	-85	-84	0.013	0.5	0.4	

Third Portage Pit Sumps Water Quality (Pit E)

Parameters	Units	Probable Scenario Predicted Model Year 4*	Possible Poor end Scenario Predicted Model Year 4*	Annual Average Water Quality Forecast Value Model Year 2021***	Lower 25th Centile Water Quality Forecast Value***	Measured		% Difference between predicted vs measured - mean		% Difference between predicted vs measured - Lower 25th percentile*		CCME Guidelines**	MMER Schedule 4, Table 2**	Water License Discharge to 3PL**				
						Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor							
															Annual Average	Lower 25th centile	Long Term, Based on 3PL quality	Max. Monthly Mean
pH		6.3	6.1	7.8	7.0	7.69	7.54	22	26	20	24	24	24	4	4	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0
Alkalinity (un-ionized)	mg CaCO3/L	40	43	78	70	82	72	106	92	68	68	6	18	-7	4	0.016	--	--
Ammonia nitrogen																		

**2021 Comparison of predicted pit water quantity and quality to the measured water quantity and quality
LIFE OF MINE YEAR 12**

North Portage Pit Sumps Water Quality (Pit A)

Parameters	Units	Probable Scenario Predicted Model Year 4*	Possible Poor end Scenario Predicted Model Year 4*	Annual Average Water Quality Forecast Value Model Year 2021****	Lower 25% Centile Water Quality Forecast Value***	Measured		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile *		% Difference between predicted vs measured- mean		% Difference between predicted vs measured- Lower 25th percentile *		CCME Guidelines**	MOMER Schedule 4, Table 2**	Water License Discharge to SPL**	
						Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor	Annual Average	Lower 25th centile	Annual Average	Lower 25th centile				
pH		6.3	6.1			7.52	7.33	19	23	16	20								
Alkalinity	mg CaCO3/L	0.05	2.40	108	99	67	55	134 493	2 704	109 335	2 180	-37	-32	-49	-45	--	--	--	--
Ammonia (unionized)	mg N/L	0.003	0.001			0.1919	0.1488	6 275	13 561	4 858	10 525					0.016	--	--	--
Ammonia nitrogen	mg N/L	12	9	21	18	18.9	13.4	41	90	12	51	-18	-8			3.83	--	15	15
Dissolved Arsenic	mg/L	0.000	0.056	0.711	0.657	0.0526	0.0359	116 790	-6	79 599	-36	-93	-92	-95	-95	0.005	0.3	0.3	0.3
Chloride	mg/L	0	0	128	116	71	47	7 241 928	28 289	4 770 308	18 500	-45	-39	-63	-60	120	--	1000	1000
Dissolved Copper	mg/L	0.000	0.007	0.895	0.810	0.4860	0.3881	4 419 247	6 843	1 710 070	2 557	-45	-40	-79	-77	0.002	0.3	0.3	0.3
Fluoride	mg/L	0.000	0.031	0.387	0.353	0.23	0.19	2 851 463	636	2 374 900	513	-41	-35	-51	-46	0.12	--	--	--
Hardness	mg CaCO3/L	0	8			385	303	872 497	4 808	673 233	3 688					--	--	--	--
Dissolved Lead	mg/L	0.0000	0.0029	0.0019	0.0012	0.0001	0.0001	6 167	-35	2 263	-68	-90	-89	-96	-96	0.001	0.1	0.1	0.1
Dissolved Nickel	mg/L	0.000	0.043	0.027	0.025	0.3208	0.1476	943 528	646	434 091	243	1 082	1 177	444	488	0.025	0.5	0.2	0.2
Dissolved Barium	mg/L	0.000	0.013	0.157	0.144	0.0212	0.0169	111 540	63	88 589	30	-86	-85	-89	-88	--	--	--	--
Dissolved Cadmium	mg/L	0.000	0.000	0.000	0.000	0.0000	0.0000	2 948	-62	2 500	-62	-77	-74	-78	-75	0.0004	--	0.002	0.002
Dissolved Iron	mg/L	0.000	2 100	1 494	1 376	0.0346	0.0056	35 552	-98	5 905	-100	-98	-97	-100	-100	0.3	--	--	--
Dissolved Mercury	mg/L	0.0000	0.0000	0.0000	0.0000	0.00003	0.00001	48 338	-6	8 829	-83	34	40	-75	-74	0.000026	--	0.0004	0.0004
Dissolved Manganese	mg/L	0.0002	0.2200	0.1350	0.1261	0.3978	0.3023	265 068	81	201 403	37	195	215	124	140	0.23	--	--	--
Dissolved Molybdenum	mg/L	0.0000	0.0008	0.1544	0.1366	0.0561	0.0425	1 401 181	6 820	1 082 150	5 146	-64	-59	-72	-69	0.073	--	--	--
Dissolved Selenium	mg/L	0.0000	0.0006	0.0187	0.0161	0.0146	0.0118	486 929	2 419	384 317	1 940	-22	-10	-37	-27	0.001	--	--	--
Dissolved Thallium	mg/L	0.0000	0.0001	0.0008	0.0007	0.0001	0.0000	4 251	7	952	-74	-92	-91	-98	0.0008	--	--	--	
Nitrate	mg/L	13.0	10.0	3.6	3.3	1.40	1.15	89	-86	41	-88	-61	-57	-68	-65	2.94	--	20	20
Sulphate	mg/L	0	9	2197	1990	596	471	5 416 036	6 670	4 284 445	5 256	-73	-70	-79	-76	129	--	--	--
Total dissolved solids	mg/L	28	41	2659	2422	1003	789	3 482	2 347	2 716	1 823	-62	-59	-70	-67	--	--	--	--
Dissolved Zinc	mg/L	0.0000	0.0370	0.0045	0.0044	0.0042	0.0011	12 998	-89	3 345	-97	-7	-6	-75	-75	0.013	0.5	0.4	0.4

Footnotes:

- Highlighted values represent exceedences of greater than 20% relative percent difference between predicted vs measured values.
- * Used year 10 predictions for Vaah which represent 3rd year of pit flooding, year 3 for Goose and year 4 for Portage which represent active pit operations as presented in Golder, 2007 - Water Quality Predictions Meadowbank Gold Project Doc No 516, Ver 0
- ** Discharge criteria and guidelines based on total metal concentrations. Sulphate guideline based on threshold value from BC Environment guideline for the protection of aquatic life for very soft water (0-30 mg/L) (April 2013).
- *** Annual average water quality and 25% centile values shown in this table are based on the water quality forecast considered in the Meadowbank Interim Closure and Reclamation Plan - Update 2019, Doc. No. 662987-5000-4EER-0001, rev. 00.
- **** Some have no lower 25th percentile data as only 1 or 2 samples were taken in 2019.
- Highlighted values in yellow indicate a mean measured value greater than the discharge criteria or guidelines.

**2022 Comparison of predicted pit water quantity and quality to the measured water quantity and quality
LIFE OF MINE YEAR 13**

Water Quantity (SURFACE RUNOFF & INFILTRATION)

Pit	Predicted (m³)	Measured (m³)	% Difference between predicted vs measured	Predicted Model Year
Portage**	167 478	228 210	36	2022
Bay Goose**	343 657	260 000	-24	2022
Vault Pit*	350 800	326 350	-7	2022

*Predicted volumes from August 2007 "Waste and Water Management Plan - Meadowbank Gold Project, Table 12.2, Year 7 and include runoff to Vault Pit and other drainage area. In Year 13, the pits in Vault area are naturally refilling. For Year 13, for Vault, use the runoff estimated in Table 12.2
**For Portage and Bay Goose, values include surface runoff and infiltration into the pit based on the water balance considered in the ICRP update 2019.

Vault Pit Sumps Water Quality

Parameters	Units	Probable Scenario Predicted Model Year 11*	Possible Poor end Scenario Predicted Model Year 11*	Measured		% Difference between predicted vs measured - mean		% Difference between predicted vs measured - Lower 25th percentile*		CCME Guidelines**	MMER Schedule 4, Table 2**	Water License Discharge to Wally Lake**			
				Mean	Lower 25th centile*	Probable	Possible Poor	Probable	Possible Poor				Long Term, Based on 3PL quality	Max. Monthly Mean	Max. Avg Conc.
pH		6.70	6.80	7.48	14	12	12	10	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0				
Alkalinity (un-ionized)	mg CaCO3/L	9	11	45	42	411	313	282							
Ammonia nitrogen	mg N/L	0.0009	0.0018	0.07	0.08	-56	-71	-59	1.83	--	20				
Dissolved Arsenic	mg/L	0.003	0.018	0.0028	0.0022	739	96	613	0.005	0.3	0.1				
Chloride	mg/L	0.530	0.540	8	7	1 354	1 327	1 164	1 141	120	--	500			
Dissolved Copper	mg/L	0.0052	0.0078	0.0017	0.0017	238	126	217	112	0.002	0.3	0.1			
Fluoride	mg/L	0.037	0.07	0.09	80	67	-100	-100	0.12	--	--				
Hardness	mg CaCO3/L	12	16	106	91	781	561	662	471	--	--				
Dissolved Lead	mg/L	0.00200	0.00210	0.0001	0.0001	-40	-43	-73	-74	0.001	0.1	0.1			
Dissolved Nickel	mg/L	0.0058	0.0061	65	47	1 216	271	249	234	0.025	0.5	0.2			
Dissolved Barium	mg/L	0.008	0.012	0.0127	0.0115	56	9	42	-4	--	--				
Dissolved Cadmium	mg/L	0.00020	0.00024	0.00001	-52	-60	-53	-60	0.00004	--	0.002				
Dissolved Iron	mg/L	0.013	0.013	0.0103	0.0045	-21	-21	-46	46	1.3	--	0.0004			
Dissolved Mercury	mg/L	0.00031	0.00034	0.00001	0.00001	-48	-71	-98	71	0.000026	--	--			
Dissolved Manganese	mg/L	0.00048	0.00130	0.0079	0.0037	1 551	510	669	184	0.23	--	--			
Dissolved Molybdenum	mg/L	0.00049	0.01100	0.0211	0.0179	4 196	91	3 553	63	0.073	--	--			
Dissolved Selenium	mg/L	0.00040	0.00058	0.0003	0.0002	-35	-55	-43	-60	0.001	--	--			
Dissolved Thallium	mg/L	0.00079	0.000086	0.000014	0.000011	-82	-84	-86	-87	0.0008	--	--			
Nitrate	mg/L	0.4	0.24	1.43	1.17	925	498	736	388	2.94	--	50			
Sulphate	mg/L	4	27	133	112	864	391	702	601	128	--	--			
Total dissolved solids	mg/L	20	27	133	112	864	391	702	601	128	--	--			
Dissolved Zinc	mg/L	0.00220	0.00240	0.0040	0.0022	83	67	-2	-10	0.013	0.5	0.2			

Phaser Pit Sumps Water Quality Year 13

Parameters	Units	Probable Scenario Predicted Model Year 11*	Possible Poor end Scenario Predicted Model Year 11*	Measured		% Difference between predicted vs measured - mean		% Difference between predicted vs measured - Lower 25th percentile*		CCME Guidelines**	MMER Schedule 4, Table 2**	Water License Discharge to Wally Lake**			
				Mean	Lower 25th centile*	Probable	Possible Poor	Probable	Possible Poor				Long Term, Based on 3PL quality	Max. Monthly Mean	Max. Avg Conc.
pH		6.70	6.80	7.76	7.77	16	14	16	14	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0			
Alkalinity (un-ionized)	mg CaCO3/L	9.9	11	41	33	364	276	271	200	0.016	--	--			
Ammonia nitrogen	mg N/L	0.15	0.23	0.1	0.1	-67	-78	-67	-78	1.83	--	20			
Dissolved Arsenic	mg/L	0.00031	0.018	0.0018	0.0013	481	-90	316	-83	0.005	0.3	0.1			
Chloride	mg/L	0.530	0.540	3	2	409	400	315	307	120	--	500			
Dissolved Copper	mg/L	0.0052000	0.0078	0.0027	0.0024	418	245	367	211	0.002	0.3	0.1			
Fluoride	mg/L	0.0370000	0.040	0.07	0.0	84	70	-100	-100	0.12	--	--			
Hardness	mg CaCO3/L	12	16	77	58	540	380	381	260	120	--	--			
Dissolved Lead	mg/L	0.0020000	0.00210	0.0002	0.0001	-24	-28	-42	-44	0.001	0.1	0.1			
Dissolved Nickel	mg/L	0.000480	0.00051	0.0019	0.0019	280	287	288	265	0.025	0.5	0.2			
Dissolved Barium	mg/L	0.008100	0.012	0.0141	0.0103	75	19	27	-14	--	--				
Dissolved Cadmium	mg/L	0.0002000	0.00024	0.00001	0.00001	-58	-65	-63	-69	0.00004	--	0.002			
Dissolved Iron	mg/L	0.013000	0.013	0.0241	0.0083	85	85	-36	-36	0.3	--	--			
Dissolved Mercury	mg/L	0.00031000	0.0003400	0.00001	0.00001	-48	-71	-68	-71	0.000026	--	0.0004			
Dissolved Manganese	mg/L	0.000480	0.00130	0.0054	0.0039	1 039	317	702	196	0.23	--	--			
Dissolved Molybdenum	mg/L	0.000490	0.01100	0.0089	0.0065	1 717	-19	1 220	-41	0.073	--	--			
Dissolved Selenium	mg/L	0.0004000	0.00058	0.0002	0.0001	-58	-71	-69	-79	0.001	--	--			
Dissolved Thallium	mg/L	0.000790	0.000086	0.000006	0.000005	-82	-83	-83	-84	0.0008	--	--			
Nitrate	mg/L	0.4	0.24	0.7	0.5	433	211	243	100	2.94	--	50			
Sulphate	mg/L	4.0	27	35	24	733	422	467	256	128	--	--			
Total dissolved solids	mg/L	20	27	136	80	431	293	300	196	128	--	--			
Dissolved Zinc	mg/L	0.002200	0.00240	0.0016	0.0009	-18	-28	-61	-65	0.013	0.5	0.2			

Goose Island Pit Lake Water Quality Year 13

Parameters	Units	Probable Scenario Predicted Model Year 3*	Possible Poor end Scenario Predicted Model Year 3*	Annual Average Water Quality Forecast Value Model Year 2022***	Lower 25% Centile Water Quality Forecast Value***	Measured		% Difference between predicted vs measured - mean		% Difference between predicted vs measured - Lower 25th percentile*		% Difference between predicted vs measured - Lower 25th percentile**		CCME Guidelines**	MMER Schedule 4, Table 2**	Water License Discharge to 3PL**						
						Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor	Annual Average	Lower 25th centile				Annual Average	Lower 25th centile				
pH		6.1	6.1	21	20	7.85	7.79	30	43	196	196	58	58	273	295	100	111	6.5 to 9.0	6.0 to 9.5	6.0 to 9.0		
Alkalinity (un-ionized)	mg CaCO3/L	27	27	0	0	1 517	0.0000	26 983	26 983	-100	-100											
Ammonia nitrogen	mg N/L	0	0	3	2	20.2	10.4	275	275	92	92	567	753	241	337	483	--	--	16			
Dissolved Arsenic	mg/L	0.002	0.002	0.002	0.002	1 924	1 924	21 926	21 926	9 839	9 839	20 346	24 026	9 126	10 787	0.005	0.002	0.3	0.3			
Chloride	mg/L	440	440	18	14	69	30	84	84	-93	-93	258	387	88	111	120	--	--	1000			
Dissolved Copper	mg/L	0.001	0.001	0.001	0.001	0.028	0.023	199	199	143	143	97	96	97	96	97	96	97	96	0.002	0.3	0.1
Fluoride	mg/L	0.130	0.130	0.157	0.143	0.24	0.20	88	88	51	51	56	71	26	38	42	--	--	1000			
Hardness	mg CaCO3/L	210	210	10	8	382	307	82	82	2	2	2	2	2	2	2	2	2	2	--	--	
Dissolved Lead	mg/L	0.0011	0.0011	0.0001	0.0001	0.0000	0.0000	-95	-97	-97	-97	-56	-56	-77	-75	0.001	0.1	0.1	0.1			
Dissolved Nickel	mg/L	0.002	0.002	0.003	0.002	0.0408	0.0218	1 938	1 938	990	990	1 373	1 613	687	815	0.025	0.5	0.2	0.2			
Dissolved Barium	mg/L	0.007	0.010	0.009	0.009	0.016	0.016	17	17	238	238	245	245	99	113	--	--	--	--			
Dissolved Cadmium	mg/L	0.000	0.000	0.000	0.000	0.0000	0.0000	-80	-83	-83	-83	-89	-89	-91	-90	0.00004	--	--	0.002			
Dissolved Iron	mg/L	0.250	0.250	0.052	0.043	0.1003	0.0045	-86	-86	-88	-88	-80	-76	-91	-89	0.3	--	--	--			
Dissolved Mercury	mg/L	0.0000	0.0000	0.0000	0.0000	0.0199	0.0107	9 833	9 833	5 269	5 269	242	337	85	136	0.001	--	--	--			
Dissolved Manganese	mg/L	0.0000	0.0000	0.0009	0.0009	0.0000	0.0000	-57	-57	-59	-59	-99	-99	-99	-99	0.0008	--	--	--			
Dissolved Molybdenum	mg/L	0.1300	0.1300	0.0672	0.0625	0.0398	0.0248	-69	-69	-81	-81	-41	-36	-63	-60	0.23	--	--	0.0004			
Dissolved Selenium	mg/L	0.0086	0.0086	0.0332	0.0262	0.0541	0.0271	529	529	215	215	63	106	-18	3	0.073	--	--	--			
Dissolved Thallium	mg/L	0.0002	0.0002	0.0006	0.0005	0.0199	0.0107	9 833	9 833	5 269	5 269	242	337	85	136	0.001	--	--	--			
Nitrate	mg/L	0.0000	0.0000	0.0009	0.0009	0.0000	0.0000	-57	-57	-59	-59	-99	-99	-99	-99	0.0008	--	--	--			
Sulphate	mg/L	4.0	4.0	0.5	0.35	0.16	-91	-91	-91	-96	-96	-37	-21	-70	-63	2.94	--	--	20			
Total dissolved solids	mg/L	21	21	228	181	636	299	2 928	2 928	1 321	1 321	179	251	31	65	128	--	--	--			
Dissolved Zinc	mg/L	0.0051	0.0051	0.0026	0.0024	0.0015	0.0008	-70	-70	-85	-85	-41	-38	-70	-68	0.013	0.5	0.4	0.4			

Third Portage Pit Sumps Water Quality Year 13 (Pit E)

Parameters	Units	Probable Scenario Predicted Model Year 4*	Possible Poor end Scenario Predicted Model Year 4*	Annual Average Water Quality Forecast Value Model Year 2022***	Lower 25% Centile Water Quality Forecast Value***	Measured		% Difference between predicted vs measured - mean		% Difference between predicted vs measured - Lower 25th percentile*		% Difference between predicted vs measured - Lower 25th percentile**		CCME Guidelines**	MMER Schedule 4, Table 2**	Water License Discharge to 3PL**			
						Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor	Annual Average	Lower 25th centile				Annual Average	Lower 25th centile	
pH		6.3	6.1	61	70	8.30	8.11	32	36	29	33	49	30	30	13				
Alkalinity (un-ionized)	mg CaCO3/L	40	43	0.006	0	0.15	0.00	28 510	28 510	-100	-								

**2022 Comparison of predicted pit water quantity and quality to the measured water quantity and quality
LIFE OF MINE YEAR 13**

North Portage PR Sumps Water Quality Year 13 (PI 4)

Parameters	Units	Probable Scenario Predicted Model Year 4*	Possible Poor end Scenario Predicted Year 4*	Annual Average Water Quality Forecast Value Model Year 2022****	Lower 25% Centile Water Quality Forecast Value***	Measured		% Difference between predicted vs measured - mean		% Difference between predicted vs measured - Lower 25th percentile *		% Difference between predicted vs measured - mean		% Difference between predicted vs measured - Lower 25th percentile *		CCME Guidelines**	MOMER Schedule 4, Table 2**	Water License Discharge to SPL**	
						Mean	Lower 25th centile	Probable	Possible Poor	Probable	Possible Poor	Annual Average	Lower 25th centile	Annual Average	Lower 25th centile				
pH		6.3	6.1			8.10	7.72	29	33	22	26								
Alkalinity	mg CaCO3/L	0.05	2.40	65	99	100	74	199 813	4 065	148 083	2 987	55	1	15	-25	--	--	--	
Ammonia (unionized)	mg N/L	0.003	0.001			0.5800	0.0000	19 233	41 329	-100	-100					0.016	--	--	
Ammonia nitrogen	mg N/L	12	9	21	18	21.6	11.7	60	143	-3	31	5	17			3.83	--	15	
Dissolved Arsenic	mg/L	0.000	0.056	0.711	0.657	0.0602	0.0286	133 623	7	63 344	-49	-92	-91	-96	-96	0.005	0.3	0.3	
Chloride	mg/L	0	0	128	116	115	86	11 729 492	45 880	8 762 655	34 250	-10	-1	-33	-26	120	--	1000	
Dissolved Copper	mg/L	0.000	0.007	0.895	0.810	0.2181	0.0900	1 982 579	3 016	826 207	1 198	-76	-73	-90	-89	0.002	0.3	0.1	
Fluoride	mg/L	0.000	0.031	0.387	0.353	0.29	0.24	3 612 817	632	3 046 775	686	-25	-18	-37	-31	0.12	--	--	
Hardness	mg CaCO3/L	0	8			544	397	1 207 685	6 694	882 169	4 863					--	--	--	
Dissolved Lead	mg/L	0.0000	0.0029	0.0015	0.0012	0.0002	0.0001	7 360	-45	4 349	-97	-88	-87	-93	-92	0.001	0.1	0.1	
Dissolved Nickel	mg/L	0.000	0.043	0.027	0.025	0.1598	0.0956	469 903	272	192 738	52	489	536	142	161	0.025	0.5	0.2	
Dissolved Barium	mg/L	0.000	0.013	0.157	0.144	0.0287	0.0204	151 021	121	107 413	57	-82	-80	-87	-86	--	--	--	
Dissolved Cadmium	mg/L	0.000	0.000	0.000	0.000	0.0000	0.0000	3 049	-81	2 071	-87	-76	-73	-83	-81	0.0004	--	0.002	
Dissolved Iron	mg/L	0.000	2 100	1 494	1 376	0.0386	0.0119	39 719	-98	12 116	-99	-97	-99	-99	-99	0.3	--	--	
Dissolved Mercury	mg/L	0.0000	0.0000	0.0000	0.0000	0.00009	0.00008	157 043	203	138 293	167	336	355	284	301	0.000026	--	0.0004	
Dissolved Manganese	mg/L	0.0002	0.2200	0.1350	0.1261	0.4055	0.3637	270 229	84	242 333	65	200	222	169	188	0.23	--	--	
Dissolved Molybdenum	mg/L	0.0000	0.0008	0.1544	0.1544	0.0785	0.0465	1 261 775	9 588	1 161 463	5 636	-49	-43	-70	-65	0.073	--	--	
Dissolved Selenium	mg/L	0.0000	0.0006	0.0187	0.0187	0.0234	0.0114	778 356	3 926	379 983	1 866	25	45	-39	-29	0.001	--	--	
Dissolved Thallium	mg/L	0.0000	0.0001	0.0008	0.0007	0.0000	0.0000	628	-82	348	-89	-99	-99	-99	0.0008	--	--		
Nitrate	mg/L	13.0	10.8	3.6	3.3	1.08	0.57	92	-99	-46	-94	-70	-67	-84	-83	2.94	--	20	
Sulphate	mg/L	0	9	2197	1990	862	613	7 832 476	9 691	5 569 786	6 662	-61	-57	-72	-69	129	--	--	
Total dissolved solids	mg/L	28	41	2659	2422	1520	1051	5 330	3 608	3 654	2 464	-43	-37	-60	-57	--	--	--	
Dissolved Zinc	mg/L	0.0000	0.0370	0.0045	0.0044	0.0033	0.0012	10 150	-81	3 494	-97	-27	-26	-74	-74	0.013	0.5	0.4	

Footnotes:

- Highlighted values represent exceedences of greater than 20% relative percent difference between predicted vs measured values.
- * Used year 11 predictions for Vaah which represent 3rd year of pit flooding, year 3 for Goose and year 4 for Portage which represent active pit operations as presented in Golder, 2007 - Water Quality Predictions Meadowbank Gold Project Doc No 516, Ver 0
- ** Discharge criteria and guidelines based on total metal concentrations. Sulphate guideline based on threshold value from BC Environment guideline for the protection of aquatic life for very soft water (0-30 mg/L) (April 2013).
- *** Annual average water quality and 25% centile values shown in this table are based on the water quality forecast considered in the Meadowbank Interim Closure and Reclamation Plan - Update 2019, Doc No. 662987-5000-4EER-0001, rev. 00.
- † Some have no lower 25th percentile data as only 1 or 2 samples were taken in 2019.
- Highlighted values in yellow indicate a mean measured value greater than the discharge criteria or guidelines.