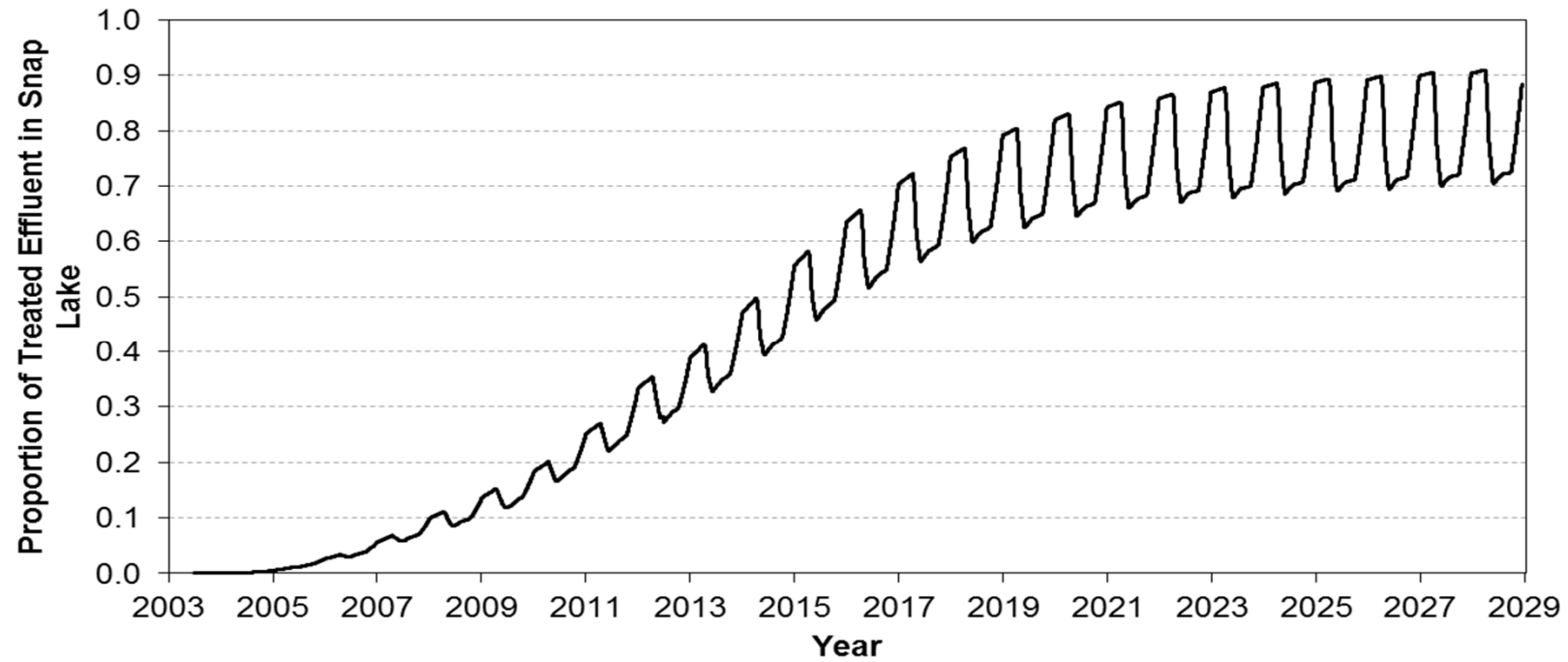


This worksheet contains a timeseries plot of model results for the proportion of effluent in Snap Lake, based on the Lower Bound minewater discharge

Figure 2-2 Proportion of Treated Effluent in Snap Lake Based on Predicted Treated Effluent Discharge Rates from the Lower Bound Scenario



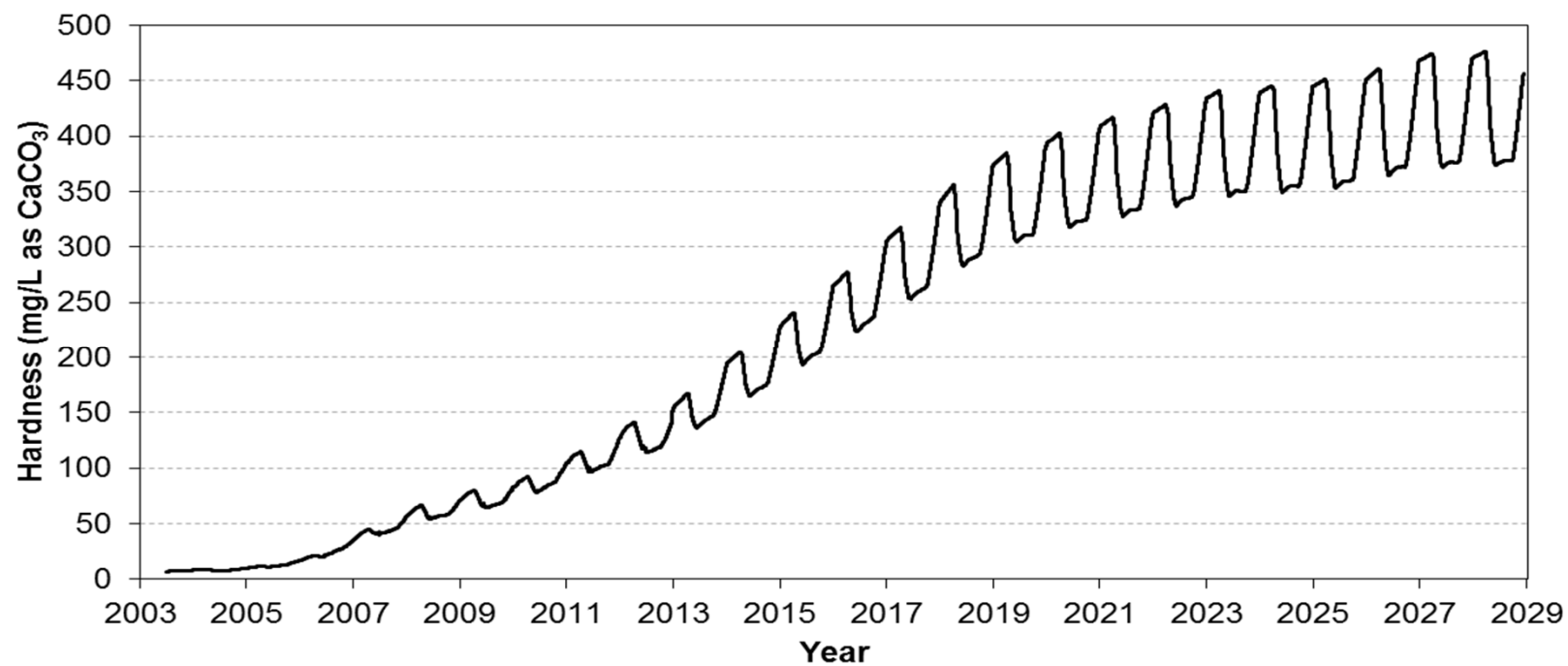
Note: Based on whole-lake average concentrations in Snap Lake.

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This worksheet contains a timeseries plot of model predictions for hardness (derived from predicted calcium and magnesium in Snap Lake). The model predictions are for Lower Bound Scenario B.

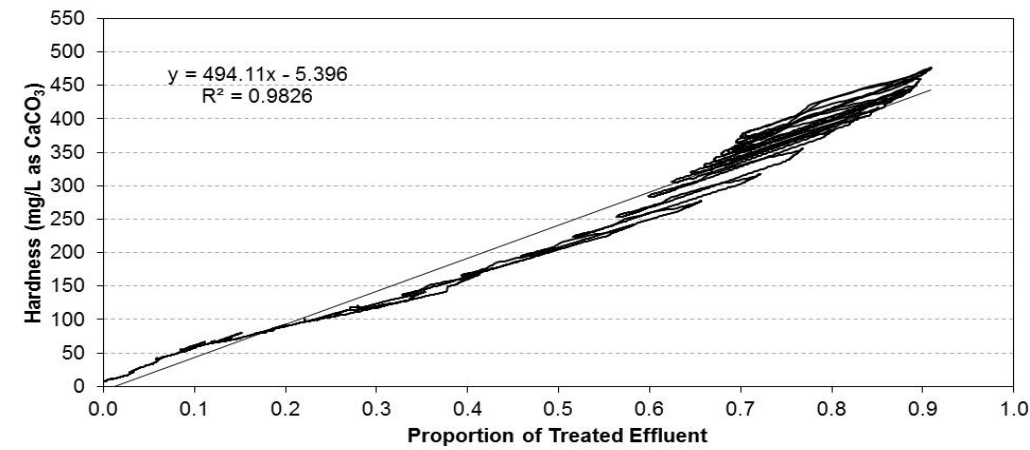
Figure I-1 Predicted Hardness Concentration in Snap Lake



Note: Based on whole-lake average concentrations in Snap Lake.
mg/L = milligrams per litre; CaCO₃ = calcium carbonate.

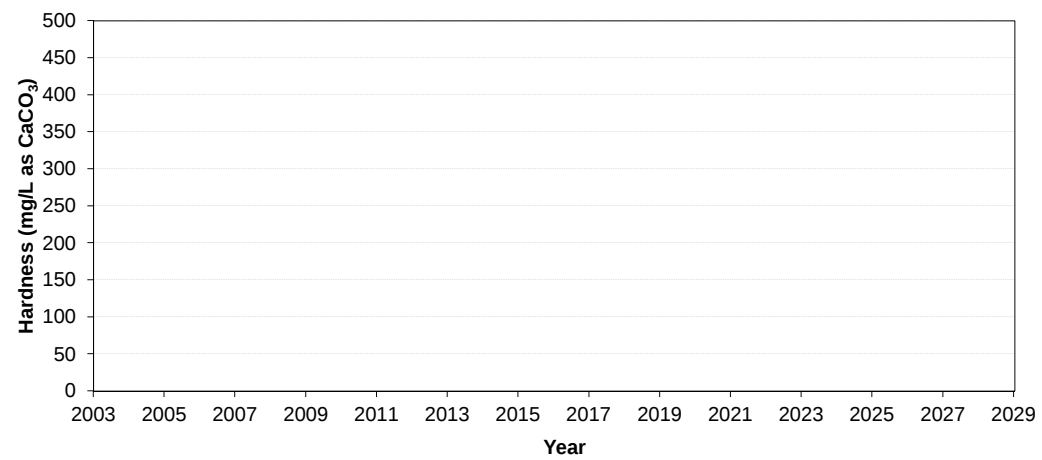
This worksheet contains the relationship between hardness and the proportion of effluent in Snap Lake
As the proportion of treated effluent in Snap Lake increases, the hardness of Snap Lake water increases

Figure I-2 Correlation between Hardness Concentrations and the Proportion of Treated Effluent in Snap Lake



Note: Based on whole-lake average concentrations in Snap Lake
mg/L = milligrams per litre; CaCO₃ = calcium carbonate

Hardness (mg/L as CaCO ₃)	Proportion of Treated Effluent in Snap Lake
10	0.01
20	0.03
30	0.05
40	0.07
50	0.09
60	0.11
70	0.13
80	0.15
90	0.17
100	0.19
110	0.21
120	0.23
130	0.25
140	0.27
150	0.29
160	0.31
170	0.33
180	0.35
190	0.37
200	0.39
210	0.41
220	0.43
230	0.45
240	0.47
250	0.50
300	0.60
350	0.70
400	0.80
450	0.90
500	1.00



Calculation of Water Quality Based Effluent Quality Criteria for De Beers Snap Lake Mine

Treated effluent discharge:	57,013 m ³ /day	<i>based on average predicted treated effluent discharge during volumes of lake water that mix with 1 volume of effluent equivalent to sampling frequency in DBCI water licence (or</i>
Dilution provided by diffuser:	12	
Samples taken per month:	4	

Parameter	Concentrations in Natural Inflows To Snap Lake (mg/L)	Effluent Variability (Coefficient of Variation) Observed	Proportion of Treated Effluent in Snap Lake	Equivalent Natural Inflow Rate (m ³ /day)	Snap Lake Hardness (mg/L as CaCO ₃)	AEMP Benchmark (mg/L)
Sulphate	2.12	0.30	0.27	152,273	140	309
	2.12	0.30	0.29	137,800	150	309
	2.12	0.30	0.31	125,199	160	309
	2.12	0.30	0.33	114,129	170	309
	2.12	0.30	0.35	104,327	180	309
	2.12	0.30	0.37	95,588	190	429
	2.12	0.30	0.39	87,746	200	429
	2.12	0.30	0.41	80,671	210	429
	2.12	0.30	0.43	74,255	220	429
	2.12	0.30	0.45	68,411	230	429
	2.12	0.30	0.47	63,065	240	429
	2.12	0.30	0.50	58,156	250	429
	2.12	0.30	0.60	38,609	300	429
	2.12	0.30	0.70	24,735	350	429
	2.12	0.30	0.80	14,377	400	429
	2.12	0.30	0.90	6,348	450	429

ng the year of maximum discharge (2026).

nce every 6 days)

Waste Load Allocation	Long Term Average			Maximum Daily Limit		Average Monthly Limit	
	Averaging Period	Multiplier	Concentration (mg/L)	Multiplier	Concentration (mg/L)	Multiplier	Concentration (mg/L)
937	4	0.715	669	1.90	1269	1.26	846
886	4	0.715	633	1.90	1201	1.26	801
841	4	0.715	601	1.90	1140	1.26	760
800	4	0.715	572	1.90	1085	1.26	723
763	4	0.715	546	1.90	1035	1.26	690
1014	4	0.715	725	1.90	1374	1.26	916
971	4	0.715	694	1.90	1316	1.26	877
932	4	0.715	666	1.90	1263	1.26	842
895	4	0.715	640	1.90	1213	1.26	809
862	4	0.715	616	1.90	1168	1.26	779
831	4	0.715	594	1.90	1126	1.26	750
802	4	0.715	573	1.90	1086	1.26	724
683	4	0.715	488	1.90	925	1.26	617
594	4	0.715	425	1.90	806	1.26	537
526	4	0.715	376	1.90	713	1.26	476
473	4	0.715	338	1.90	640	1.26	427

Table 1-3 Effluent Quality Criteria for Sulphate based on Increasing Snap Lake Hardness Concentrations

Parameter	Proportion of Treated Effluent in Snap Lake	Snap Lake Hardness	AEMP Benchmark	Waste Load Allocation Concentration	Long Term Average Concentration	Maximum Daily Limit Concentration	Average Monthly Limit Concentration	Annual Loading Limit
		(mg/L as CaCO ₃)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(kg/day)
Sulphate	0.27	140	309	937	669	1,269	846	38,112
	0.29	150	309	886	633	1,201	801	36,065
	0.31	160	309	841	601	1,140	760	34,227
	0.33	170	309	800	572	1,085	723	32,568
	0.35	180	309	763	546	1,035	690	31,063
	0.37	190	429	1,014	725	1,374	916	41,267
	0.39	200	429	971	694	1,316	877	39,521
	0.41	210	429	932	666	1,263	842	37,916
	0.43	220	429	895	640	1,213	809	36,437
	0.45	230	429	862	616	1,168	779	35,069
	0.47	240	429	831	594	1,126	750	33,801
	0.50	250	429	802	573	1,086	724	32,621
	0.60	300	429	683	488	925	617	27,776
	0.70	350	429	594	425	806	537	24,188
	0.80	400	429	526	376	713	476	21,422
	0.90	450	429	473	338	640	427	19,226

Note: The effluent quality criteria in the highlighted row were recommended for the Mine

a) Calculations were based on an average predicted treated effluent discharge of 57,013 cubic metres per day (m³/d) (average predicted treated effluent discharge during the year of maximum discharge [2026]), a dilution factor of 12 (volumes of lake water that mix with one volume of treated effluent), and on the assumption that four samples were collected per month (equivalent to sampling frequency in De Beers Water Licence of once every six days)

b) Long term average concentrations were calculated assuming an averaging period of four days

AEMP = Aquatic Effects Monitoring Program; mg/L = milligrams per litre; CaCO₃ = calcium carbonate.