

Taseko Mines Limited

New Prosperity Gold-Copper Mine Project

BIOTIC LIGAND MODEL

TECHNICAL APPENDIX 2.7.2.4B-E

September 2012

A1 Results of Biotic Ligand Modelling (BLM) for predicted copper, cadmium, and silver at the Fish Lake System and the Mixing Points

The HydroQual 2007 version of the Biotic Ligand Model (BLM) was used to evaluate the potential effects of predicted copper, cadmium and silver concentrations on aquatic life. The results of the stochastic and mixing point models were compared with provincial and federal water quality guideline values, as well as examples of ecological risk assessment values to characterize potential effects on water quality associated with the project. Predicted concentrations of cadmium, copper and silver for Years 1 to 100 were further evaluated using the BLM. HydroQual's BLM combines published toxicity data for fish and invertebrates including Rainbow Trout (*Oncorhynchus mykiss*)¹ and water flea (*Daphnia magna*, *D. pulex* and *Ceriodaphnia dubia*) to predict the toxicity of copper, silver, cadmium² in the context of ambient conditions. The model ultimately generates LC₅₀ concentrations for these metals in the context of mitigating effects from dissolved organic matter (DOM), cations (Ca, Mg, Na, K), sulphate, sulphide and other parameters shown in Table 1.

Table 1. BLM input parameters and ranges

Parameter	Model Input Range
Temperature °C	10 °C to 25 °C
pH	4.9 to 9.2
Dissolved organic carbon (DOC)	0.05 mg/L to 29.65 mg/L
Dissolved inorganic carbon (DIC)	0.056 (mmol/L) to 44.92 (mmol/L)
Humic Acid Content (%)	10% to 60%
Calcium (Ca)	0.204 mg/L to 120.24 mg/L
Magnesium (Mg)	0.024 mg/L to 51.8 mg/L
Alkalinity	1.99 mg/L to 360 mg/L
Sodium (Na)	0.16 mg/L to 236.9 mg/L
Potassium (K)	0.039 mg/L to 156 mg/L
Sulphate (SO ₄)	0.096 mg/L to 278.4 mg/L
Chloride (Cl ⁻)	0.32 mg/L to 279.72 mg/L
Sulfide (SO ₂)	1E-10 mg/L (default value)

DIC – where DIC data not available, alkalinity used as a surrogate
Humic Acid Content – where HAC data not available, 10% is the default value
Sulphide – where sulphide data not present, 1E-10 is the default value

¹The BLM also models on Fathead Minnow (*Pimephales promelas*) however Rainbow Trout was emphasized in our analyses.

² BLM was not used to evaluate zinc because the stochastic and mixing point models did not indicate potential guideline exceedances in Fish Lake, Upper Fish Creek, Trib 1 or the mixing points (Beece Creek, Taseko River, Lower Fish Creek, Wasp Lake, Little and Big Onion Lakes)

The importance of some of these parameters to predicting metal toxicity is outlined below (HydroQual, Inc, 2007):

- pH affects the chemical speciation of metals, is important to the metal complexation capacity of dissolved organic matter (DOM) and to determining the speciation of inorganic carbon, which is relevant to the formation of metal carbonate complexes
- DOM can affect metal speciation and bioavailability. Dissolved Organic Carbon (DOC) is used as a surrogate for DOM in the BLM
- Major cations (e.g. Ca) can affect the toxicity of metals like silver and copper as they will compete for binding sites at the biotic ligand
- Major anions (SO₄ and Cl⁻) - sulphate in particular, can impact the charge balance and ionic strength of the water. This in turn influences the chemical reactions for both the metals and natural organic matter, by altering reaction rates and equilibrium constants. Chloride concentrations, for example, have an effect on the model results for copper, but are more important to assessing silver, because of the potential for silver-chloride complexes.
- Alkalinity is combined with pH and is used to estimate Dissolved Inorganic Carbon (DIC); important because some metals will form carbonate complexes.
- Sulfide has a strong affinity with some metals and metal species, affecting metal speciation and bioavailability

A1.1 BLM for Fish Lake

The average and maximum predicted concentrations of cadmium, copper and silver in Fish Lake between Years 1 to 100 were used to run the BLM. A summary of the input parameters for Fish Lake is attached in Appendix A1. The BLM has a limiting temperature range of 10°C to 25°C and the model was run on a combination of predicted and baseline temperatures in Fish Lake:

- 10°C - lower bound of the model
- 20°C - predicted maximum temperature in Fish Lake
- 12.55°C - baseline average temperatures (excluding those <10°)

Additionally, the average DOC concentration of 16.27 mg/L (range 14.5 mg/L to 20.5 mg/L) derived from the baseline dataset was used in the BLM, along with the predicted pH of 7.8 (range of 7.0 to 8.0) derived from the stochastic modelling³. The remaining input parameters were generated from the stochastic models for each phase of the project.

A1.2 BLM for Upper Fish Creek and Tributary 1

The average and maximum predicted concentrations of cadmium, copper and silver in Upper Fish Creek and Tributary 1 between Years 1-100 were used to run the BLM. A summary of the input parameters for these drainages is provided in Appendix A1. Similar to Fish Lake, a range of temperatures were used to run the model; 10°C to 20.5°C. Baseline DOC from the Fish Lake inlet were used to run the model, averaging 13.4 mg/L and ranging from 11.4 mg/L to 19.8 mg/L. The pH of 7.8 was also used for Upper Fish Creek and Tributary 1. The remaining input parameters were generated from the stochastic models for each phase of the project.

³ Baseline pH in Fish Lake ranged from 7.2 to 8.7 (Appendix 5-2-A, 2007)

A1.3 BLM for Pit Lake

Although stochastic modelling was conducted for the Pit Lake some of the predicted values were outside of the range of BLM input parameters (i.e. sulphate ≥ 326.3 mg/L). As a result, BLM modelling was not completed for the Pit Lake.

A1.4 BLM for Mixing points

Average and maximum predicted concentrations of cadmium, copper and silver from Years 1 to 100 for the following waterbodies were used to run the BLM:

- Beece Creek
- Taseko River
- Lower Fish Creek
- Wasp Lake

These mixing points⁴ were selected for BLM analyses as their predicted concentrations showed the potential for provincial and / or federal guideline exceedances of cadmium, copper or silver (or some combination of the three). Given the large amount of modelled data for the mixing points, only the range of average and maximum concentrations were evaluated with the BLM, focusing on the most sensitive test organism for each parameter. A combination of baseline data and mixing point model data were used for the BLM input parameters. Predicted concentrations of input parameters are shown in Appendix A2. Baseline temperature, pH and DOC data (where available) were used the analyses of the mixing points. TOC was used as a surrogate for DOC where no data for DOC were available. Modelling was also completed for the following temperatures reflecting the average and / or maximum values from the historical data:

- Beece Creek - 12.19°C, 13°C
- Taseko River – 12.19, 15°C
- Lower Fish Creek - 10°C to 20.5°C⁵

No baseline temperature data were available for Wasp Lake and as a result modelling for this waterbody was conducted on 10°C for copper and 20°C for cadmium and silver, as these temperatures appear to generate more conservative LC₅₀ values for the respective metals using the BLM.

A1.5 BLM Results for Fish Lake

A1.5.1 Copper

The BLM was run for Rainbow Trout, *Daphnia magna*, *Daphnia pulex* and *Ceriodaphnia dubia*. The results are shown in Tables 2, 3 and 4 and indicate *Daphnia pulex* was the most sensitive test organism to the predicted copper concentrations. The lowest predicted LC₅₀ values for copper occurred in Years 21 to 30 for all test organisms at all modelled temperatures (10°C, 12.55°C and 20°C). The predicted average and maximum copper concentrations in Years 21 to 30 were ≥ 142.5 times lower than their corresponding LC₅₀ concentrations.

⁴ Mixing point predictions were generated from a different model than the mine site waterbodies (see APPENDIX 2.7.2.4B-F)

⁵ The 20.5°C temperature for Lower Fish Creek reflects the maximum baseline temperature from the historical dataset

Table 2. Dissolved copper LC₅₀ modelled at 10 °C – Fish Lake

BLM test organism	Dissolved copper LC50 generated with BLM for Fish Lake @ 10 °C - using predicted averages														
	Year 1-16 LC50		Predicted avg	Year 17-20 LC50		Predicted avg	Year 21-30 LC50		Predicted avg	Year 31-47 LC50		Predicted avg	Year 48-100 LC50		Predicted avg
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.896E-05	1.205	0.0025	1.888E-05	1.200	0.0019	1.873E-05	1.190	0.0012	1.889E-05	1.200	0.0015	1.937E-05	1.231	0.0028
<i>Daphnia pulex</i>	3.455E-06	0.220		3.447E-06	0.219		3.426E-06	0.218		3.444E-06	0.219		3.507E-06	0.223	
<i>Daphnia magna</i>	5.962E-06	0.379		5.954E-06	0.378		5.917E-06	0.376		5.963E-06	0.379		6.094E-06	0.387	
<i>Ceriodaphnia dubia</i>	4.584E-06	0.291		4.575E-06	0.291		4.545E-06	0.289		4.579E-06	0.291		4.680E-06	0.297	
BLM test organism	Dissolved copper LC50 generated with BLM for Fish Lake @ 10 °C - using predicted maximums														
	Year 1-16 LC50		Predicted max	Year 17-20 LC50		Predicted max	Year 21-30 LC50		Predicted max	Year 31-47 LC50		Predicted max	Year 48-100 LC50		Predicted max
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	2.063E-05	1.311	0.0052	2.015E-05	1.280	0.0037	1.983E-05	1.260	0.0016	2.055E-05	1.306	0.0048	2.055E-05	1.306	0.0045
<i>Daphnia pulex</i>	3.659E-06	0.233		3.618E-06	0.230		3.586E-06	0.228		3.656E-06	0.232		3.668E-06	0.233	
<i>Daphnia magna</i>	6.293E-06	0.400		6.233E-06	0.396		6.183E-06	0.393		6.333E-06	0.402		6.348E-06	0.403	
<i>Ceriodaphnia dubia</i>	4.856E-06	0.309		4.805E-06	0.305		4.763E-06	0.303		4.877E-06	0.310		4.890E-06	0.311	

Table 3. Dissolved copper LC₅₀ modelled at 20 °C – Fish Lake

BLM test organism	Dissolved copper LC50 generated with BLM for Fish Lake @ 20 °C - using predicted averages														
	Year 1-16 LC50		Predicted avg	Year 17-20 LC50		Predicted avg	Year 21-30 LC50		Predicted avg	Year 31-47 LC50		Predicted avg	Year 48-100 LC50		Predicted avg
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.989E-05	1.264	0.0025	1.979E-05	1.258	0.0019	1.960E-05	1.246	0.0012	1.980E-05	1.258	0.0015	2.036E-05	1.294	0.0028
<i>Daphnia pulex</i>	3.740E-06	0.238		3.732E-06	0.237		3.704E-06	0.235		3.737E-06	0.237		3.833E-06	0.244	
<i>Daphnia magna</i>	6.369E-06	0.405		6.362E-06	0.404		6.318E-06	0.401		6.381E-06	0.405		6.560E-06	0.417	
<i>Ceriodaphnia dubia</i>	4.514E-06	0.287		4.507E-06	0.286		4.479E-06	0.285		4.510E-06	0.287		4.603E-06	0.293	
BLM test organism	Dissolved copper LC50 generated with BLM for Fish Lake @ 20 °C - using predicted maximums														
	Year 1-16 LC50		Predicted max	Year 17-20 LC50		Predicted max	Year 21-30 LC50		Predicted max	Year 31-47 LC50		Predicted max	Year 48-100 LC50		Predicted max
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	2.189E-05	1.391	0.0052	2.130E-05	1.354	0.0037	2.092E-05	1.329	0.0016	2.177E-05	1.383	0.0048	2.177E-05	1.383	0.0045
<i>Daphnia pulex</i>	3.994E-06	0.254		3.948E-06	0.251		3.908E-06	0.248		4.019E-06	0.255		4.031E-06	0.256	
<i>Daphnia magna</i>	6.767E-06	0.430		6.699E-06	0.426		6.638E-06	0.422		6.845E-06	0.435		6.855E-06	0.436	
<i>Ceriodaphnia dubia</i>	4.777E-06	0.304		4.727E-06	0.300		4.687E-06	0.298		4.792E-06	0.305		4.805E-06	0.305	

Table 4. Dissolved copper LC₅₀ modelled at 12.55 °C – Fish Lake

BLM test organism	Dissolved copper LC50 generated with BLM for Fish Lake @ 12.55 °C - using predicted averages														
	Year 1-16 LC50		Predicted avg	Year 17-20 LC50		Predicted avg	Year 21-30 LC50		Predicted avg	Year 31-47 LC50		Predicted avg	Year 48-100 LC50		Predicted avg
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.916E-05	1.218	0.0025	1.908E-05	1.212	0.0019	1.892E-05	1.202	0.0012	1.909E-05	1.213	0.0015	1.958E-05	1.244	0.0028
<i>Daphnia pulex</i>	3.511E-06	0.223		3.502E-06	0.223		3.480E-06	0.221		3.501E-06	0.222				
<i>Daphnia magna</i>	6.041E-06	0.384		6.034E-06	0.383		5.996E-06	0.381		6.046E-06	0.384				
<i>Ceriodaphnia dubia</i>	4.584E-06	0.291		4.575E-06	0.291		4.545E-06	0.289		4.579E-06	0.291				
BLM test organism	Dissolved copper LC50 generated with BLM for Fish Lake @ 12.55 °C - using predicted maximums														
	Year 1-16 LC50		Predicted max	Year 17-20 LC50		Predicted max	Year 21-30 LC50		Predicted max	Year 31-47 LC50		Predicted max	Year 48-100 LC50		Predicted max
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	2.091E-05	1.329	0.0052	2.040E-05	1.296	0.0037	2.007E-05	1.275	0.0016	2.082E-05	1.323	0.0048	2.082E-05	1.323	0.0045
<i>Daphnia pulex</i>	3.724E-06	0.237		3.682E-06	0.234		3.648E-06	0.232		3.727E-06	0.237				
<i>Daphnia magna</i>	6.388E-06	0.406		6.325E-06	0.402		6.273E-06	0.399		6.434E-06	0.409				
<i>Ceriodaphnia dubia</i>	4.856E-06	0.309		4.805E-06	0.305		4.763E-06	0.303		4.877E-06	0.310				

A1.5.2 Cadmium

Cadmium modelling was completed for Rainbow Trout and *Ceriodaphnia dubia*. The results are shown in Tables 5, 6 and 7 and indicate Rainbow Trout was the most sensitive test organism to modelled conditions. The lowest predicted LC₅₀ values for cadmium occurred in Years 1 to 16 for all test organisms at all modelled temperatures (10°C, 12.55°C and 20°C). The predicted average and maximum cadmium concentrations in Years 1 to 16 were ≥157.8 times lower than their corresponding LC₅₀ concentrations.

A1.5.3 Silver

Silver modelling was completed for Rainbow Trout and *D. magna*. The results are shown in Tables 8, 9 and 10 and indicate *D. magna* was the most sensitive to modelled conditions. The lowest modelled LC₅₀ values for predicted averages occurred in Years 48-100, whereas the lowest LC₅₀ for predicted maximums occurred in Years 31-47. The predicted silver concentrations were ≥5.7 times lower than the corresponding LC₅₀ generated with the BLM.

A1.6 BLM results Upper Fish Creek and Tributary 1

A1.6.1 Copper

The BLM was run for Rainbow Trout, *Daphnia magna*, *D. pulex* and *Ceriodaphnia dubia*. The results are shown in Tables 11 to 14 and indicate *D. pulex* was the most sensitive organism to the predicted copper concentrations. The lowest predicted LC₅₀ values for copper occurred in Years 21 to 30 for all test organisms at all modelled temperatures (10°C and 20.5°C). The predicted average and maximum copper concentrations in Years 21 to 30 were ≥63.3 times lower than their corresponding LC₅₀ concentrations.

A1.6.2 Cadmium

Cadmium modelling was completed for Rainbow Trout and *Ceriodaphnia dubia*. The results are shown in Tables 15 to 18 indicate Rainbow Trout was the most sensitive test organism to modelled conditions. The lowest predicted LC₅₀ values for cadmium occurred in Years 1 to 16 for all test organisms at all modelled temperatures (10°C and 20.5°C). The predicted average and maximum cadmium concentrations in Years 1 to 16 were ≥137.4 times lower than their corresponding LC₅₀ concentrations.

A1.6.3 Silver

Silver modelling was completed for Rainbow Trout and *Daphnia magna*. The results are shown in Tables 19 to 22 and *Daphnia* was the most sensitive test organism to modelled conditions. The lowest modelled LC₅₀ values for predicted averages occurred in Years 48-100, whereas the lowest LC₅₀ for predicted maximums occurred in Years 31-47. The predicted average and maximum silver concentrations were ≥2.6 times lower than their corresponding LC₅₀ concentrations.

Table 5. Dissolved cadmium LC₅₀ modelled at 10°C – Fish Lake

BLM test organism	Dissolved cadmium LC50 generated with BLM for Fish Lake @ 10°C - using predicted averages														
	Year 1-16 LC50		Predicted avg	Year 17-20 LC50		Predicted avg	Year 21-30 LC50		Predicted avg	Year 31-47 LC50		Predicted avg	Year 48-100 LC50		Predicted avg
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.446E-07	0.0163	0.000098	1.516E-07	0.017	0.000093	1.459E-07	0.0164	0.000085	1.672E-07	0.0188	0.000089	2.277E-07	0.0256	0.000093
<i>Ceriodaphnia dubia</i>	3.074E-06	0.3456		3.189E-06	0.3585		3.106E-06	0.3491		3.490E-06	0.3923		4.689E-06	0.5271	
BLM test organism	Dissolved cadmium LC50 generated with BLM for Fish Lake @ 10°C - using predicted maximums														
	Year 1-16 LC50		Predicted max	Year 17-20 LC50		Predicted max	Year 21-30 LC50		Predicted max	Year 31-47 LC50		Predicted max	Year 48-100 LC50		Predicted max
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.899E-07	0.0213	0.000135	1.962E-07	0.0221	0.000126	1.921E-07	0.0216	0.000102	2.810E-07	0.0316	0.000110	2.701E-07	0.0304	0.000114
<i>Ceriodaphnia dubia</i>	3.993E-06	0.4489		4.070E-06	0.4575		4.029E-06	0.4529		5.801E-06	0.6521		5.573E-06	0.6265	

Table 6. Dissolved cadmium LC₅₀ modelled at 20 °C – Fish Lake

BLM test organism	Dissolved cadmium LC50 generated with BLM for Fish Lake @ 20 °C - using predicted averages														
	Year 1-16 LC50		Predicted avg	Year 17-20 LC50		Predicted avg	Year 21-30 LC50		Predicted avg	Year 31-47 LC50		Predicted avg	Year 48-100 LC50		Predicted avg
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.441E-07	0.0162	0.000098	1.512E-07	0.0170	0.000093	1.454E-07	0.0163	0.000085	1.668E-07	0.0188	0.000089	2.274E-07	0.0256	0.000093
<i>Ceriodaphnia dubia</i>	3.072E-06	0.3453		3.181E-06	0.3576		3.098E-06	0.3482		3.484E-06	0.3916		4.688E-06	0.5270	
BLM test organism	Dissolved cadmium LC50 generated with BLM for Fish Lake @ 20 °C - using predicted maximums														
	Year 1-16 LC50		Predicted max	Year 17-20 LC50		Predicted max	Year 21-30 LC50		Predicted max	Year 31-47 LC50		Predicted max	Year 48-100 LC50		Predicted max
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.892E-07	0.0213	0.000135	1.956E-07	0.0220	0.000126	1.915E-07	0.0215	0.000102	2.807E-07	0.0316	0.000110	2.698E-07	0.0303	0.000114
<i>Ceriodaphnia dubia</i>	3.984E-06	0.4478		4.063E-06	0.4567		4.022E-06	0.4521		5.806E-06	0.6527		5.577E-06	0.6269	

Table 7. Dissolved cadmium LC₅₀ modelled at 12.55 °C – Fish Lake

BLM test organism	Dissolved cadmium LC50 generated with BLM for Fish Lake @ 12.55 °C - using predicted averages														
	Year 1-16 LC50		Predicted avg	Year 17-20 LC50		Predicted avg	Year 21-30 LC50		Predicted avg	Year 31-47 LC50		Predicted avg	Year 48-100 LC50		Predicted avg
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.445E-07	0.0162	0.000098	1.515E-07	0.0170	0.000093	1.458E-07	0.0164	0.000085	1.671E-07	0.0188	0.000089	2.276E-07	0.0256	0.000093
<i>Ceriodaphnia dubia</i>	3.073E-06	0.3454		3.187E-06	0.3583		3.104E-06	0.3489		3.488E-06	0.3921		4.688E-06	0.5270	
BLM test organism	Dissolved cadmium LC50 generated with BLM for Fish Lake @ 12.55 °C - using predicted maximums														
	Year 1-16 LC50		Predicted max	Year 17-20 LC50		Predicted max	Year 21-30 LC50		Predicted max	Year 31-47 LC50		Predicted max	Year 48-100 LC50		Predicted max
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.897E-07	0.0213	0.000135	1.960E-07	0.0220	0.000126	1.919E-07	0.0216	0.000102	2.809E-07	0.0316	0.000110	2.700E-07	0.0304	0.000114
<i>Ceriodaphnia dubia</i>	3.991E-06	0.4486		4.068E-06	0.4573		4.027E-06	0.4527		5.802E-06	0.6522		5.574E-06	0.6266	

Table 8. Dissolved silver LC₅₀ modelled at 10 °C – Fish Lake

BLM test organism	Dissolved silver LC50 generated with BLM for Fish Lake @ 10 °C - using predicted averages														
	Year 1-16 LC50		Predicted avg	Year 17-20 LC50		Predicted avg	Year 21-30 LC50		Predicted avg	Year 31-47 LC50		Predicted avg	Year 48-100 LC50		Predicted avg
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.329E-07	0.01434	0.00011	1.318E-07	0.01422	0.000109	1.308E-07	0.01411	0.000107	1.303E-07	0.01406	0.000101	1.275E-07	0.01375	0.0001
<i>Daphnia magna</i>	9.935E-09	0.0011		9.853E-09	0.0011		9.783E-09	0.0011		9.745E-09	0.0011		9.520E-09	0.00103	
BLM test organism	Dissolved silver LC50 generated with BLM for Fish Lake @ 10 °C - using predicted maximums														
	Year 1-16 LC50		Predicted max	Year 17-20 LC50		Predicted max	Year 21-30 LC50		Predicted max	Year 31-47 LC50		Predicted max	Year 48-100 LC50		Predicted max
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.401E-07	0.01511	0.000195	1.375E-07	0.01483	0.000187	1.351E-07	0.01457	0.000188	1.332E-07	0.01437	0.000184	1.337E-07	0.01442	0.000158
<i>Daphnia magna</i>	1.048E-08	0.00113		1.027E-08	0.00111		1.009E-08	0.00109		9.951E-09	0.00107		9.995E-09	0.00108	

Table 9. Dissolved silver LC₅₀ modelled at 20 °C – Fish Lake

BLM test organism	Dissolved silver LC50 generated with BLM for Fish Lake @ 20 °C - using predicted averages														
	Year 1-16 LC50		Predicted avg	Year 17-20 LC50		Predicted avg	Year 21-30 LC50		Predicted avg	Year 31-47 LC50		Predicted avg	Year 48-100 LC50		Predicted avg
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.314E-07	0.0142	0.00011	1.304E-07	0.0141	0.000109	1.297E-07	0.0140	0.000107	1.291E-07	0.0139	0.000101	1.262E-07	0.0136	0.0001
<i>Daphnia magna</i>	9.826E-09	0.00106		9.754E-09	0.00105		9.698E-09	0.00105		9.651E-09	0.00104		9.428E-09	0.00102	
BLM test organism	Dissolved silver LC50 generated with BLM for Fish Lake @ 20 °C - using predicted maximums														
	Year 1-16 LC50		Predicted max	Year 17-20 LC50		Predicted max	Year 21-30 LC50		Predicted max	Year 31-47 LC50		Predicted max	Year 48-100 LC50		Predicted max
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.375E-07	0.0148	0.000195	1.351E-07	0.0146	0.000187	1.332E-07	0.0144	0.000188	1.314E-07	0.01417	0.000184	1.318E-07	0.01422	0.000158
<i>Daphnia magna</i>	1.028E-08	0.00111		1.009E-08	0.00109		9.955E-09	0.00107		9.811E-09	0.00106		9.849E-09	0.00106	

Table 10. Dissolved silver LC₅₀ modelled at 12.55 °C – Fish Lake

BLM test organism	Dissolved silver LC50 generated with BLM for Fish Lake @ 12.55 °C - using predicted averages														
	Year 1-16 LC50		Predicted avg	Year 17-20 LC50		Predicted avg	Year 21-30 LC50		Predicted avg	Year 31-47 LC50		Predicted avg	Year 48-100 LC50		Predicted avg
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.325E-07	0.01429	0.00011	1.314E-07	0.01417	0.000109	1.305E-07	0.01408	0.000107	1.300E-07	0.01402	0.000101	1.271E-07	0.01371	0.0001
<i>Daphnia magna</i>	9.904E-09	0.00107		9.825E-09	0.00106		9.759E-09	0.00105		9.719E-09	0.00105		9.494E-09	0.00102	
BLM test organism	Dissolved silver LC50 generated with BLM for Fish Lake @ 12.55 °C - using predicted maximums														
	Year 1-16 LC50		Predicted max	Year 17-20 LC50		Predicted max	Year 21-30 LC50		Predicted max	Year 31-47 LC50		Predicted max	Year 48-100 LC50		Predicted max
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.394E-07	0.01504	0.000195	1.368E-07	0.01476	0.000187	1.345E-07	0.01451	0.000188	1.327E-07	0.01431	0.000184	1.332E-07	0.01437	0.000158
<i>Daphnia magna</i>	1.042E-08	0.00112		1.022E-08	0.00110		1.005E-08	0.00108		9.911E-09	0.001069		9.954E-09	0.00107	

Table 11. Dissolved copper LC₅₀ for Upper Fish Creek @ 10 °C

BLM test organism	Dissolved copper LC50 generated with BLM for Upper Fish Creek @ 10 °C - using predicted averages														
	Year 1-16 LC50		Predicted avg	Year 17-20 LC50		Predicted avg	Year 21-30 LC50		Predicted avg	Year 31-47 LC50		Predicted avg	Year 48-100 LC50		Predicted avg
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.585E-05	1.007	0.0018	1.585E-05	1.007	0.0017	1.579E-05	1.003	0.0016	1.591E-05	1.011	0.0019	1.635E-05	1.039	0.0032
<i>Daphnia pulex</i>	2.838E-06	0.180		2.838E-06	0.180		2.827E-06	0.180		2.840E-06	0.180		2.899E-06	0.184	
<i>Daphnia magna</i>	4.899E-06	0.311		4.906E-06	0.312		4.893E-06	0.311		4.927E-06	0.313		5.045E-06	0.321	
<i>Ceriodaphnia dubia</i>	3.711E-06	0.236		3.711E-06	0.236		3.700E-06	0.235		3.722E-06	0.237		3.808E-06	0.242	
BLM test organism	Dissolved copper LC50 generated with BLM for Upper Fish Creek @ 10 °C - using predicted maximums														
	Year 1-16 LC50		Predicted max	Year 17-20 LC50		Predicted max	Year 21-30 LC50		Predicted max	Year 31-47 LC50		Predicted max	Year 48-100 LC50		Predicted max
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.773E-05	1.127	0.0043	1.754E-05	1.115	0.0034	1.708E-05	1.085	0.0024	1.833E-05	1.165	0.0083	1.823E-05	1.158	0.0076
<i>Daphnia pulex</i>	3.034E-06	0.193		3.019E-06	0.192		2.975E-06	0.189		3.140E-06	0.200		3.120E-06	0.198	
<i>Daphnia magna</i>	5.224E-06	0.332		5.202E-06	0.331		5.139E-06	0.327		5.440E-06	0.346		5.407E-06	0.344	
<i>Ceriodaphnia dubia</i>	3.963E-06	0.252		3.944E-06	0.251		3.892E-06	0.247		4.116E-06	0.262		4.091E-06	0.260	

Table 12. Dissolved copper LC₅₀ for Trib 1 @ 10 °C

BLM test organism	Dissolved copper LC ₅₀ generated with BLM for Trib 1 @ 10 °C - using predicted averages														
	Year 1-16 LC ₅₀		Predicted avg	Year 17-20 LC ₅₀		Predicted avg	Year 21-30 LC ₅₀		Predicted avg	Year 31-47 LC ₅₀		Predicted avg	Year 48-100 LC ₅₀		Predicted avg
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.584E-05	1.007	0.002	1.585E-05	1.007	0.002	1.579E-05	1.003	0.002	1.592E-05	1.012	0.002	1.634E-05	1.038	0.003
<i>Daphnia pulex</i>	2.834E-06	0.180		2.834E-06	0.180		2.825E-06	0.180		2.841E-06	0.181		2.894E-06	0.184	
<i>Daphnia magna</i>	4.90E-06	0.311		4.91E-06	0.312		4.89E-06	0.311		4.93E-06	0.313		5.03E-06	0.320	
<i>Ceriodaphnia dubia</i>	3.705E-06	0.235		3.710E-06	0.236		3.699E-06	0.235		3.723E-06	0.237		3.800E-06	0.241	
BLM test organism	Dissolved copper LC ₅₀ generated with BLM for Trib 1 @ 10°C - using predicted maximums														
	Year 1-16 LC ₅₀		Predicted max	Year 17-20 LC ₅₀		Predicted max	Year 21-30 LC ₅₀		Predicted max	Year 31-47 LC ₅₀		Predicted max	Year 48-100 LC ₅₀		Predicted max
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.766E-05	1.122	0.004	1.729E-05	1.099	0.003	1.721E-05	1.094	0.003	1.858E-05	1.181	0.008	1.848E-05	1.174	0.007
<i>Daphnia pulex</i>	3.027E-06	0.192		2.997E-06	0.190		2.993E-06	0.190		3.149E-06	0.200		3.132E-06	0.199	
<i>Daphnia magna</i>	5.215E-06	0.331		5.171E-06	0.329		5.164E-06	0.328		5.457E-06	0.347		5.424E-06	0.345	
<i>Ceriodaphnia dubia</i>	3.955E-06	0.251		3.918E-06	0.249		3.912E-06	0.249		4.130E-06	0.262		4.105E-06	0.261	

Table 13. Dissolved copper LC₅₀ for Upper Fish Creek @ 20.5 °C

BLM test organism	Dissolved copper LC50 generated with BLM for Upper Fish Creek @ 20.5 °C - using predicted averages														
	Year 1-16 LC50		Predicted avg	Year 17-20 LC50		Predicted avg	Year 21-30 LC50		Predicted avg	Year 31-47 LC50		Predicted avg	Year 48-100 LC50		Predicted avg
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.672E-05	1.062	0.0018	1.672E-05	1.062	0.0017	1.665E-05	1.058	0.0016	1.679E-05	1.067	0.0019	1.732E-05	1.101	0.0032
<i>Daphnia pulex</i>	3.085E-06	0.196		3.089E-06	0.196		3.078E-06	0.196		3.103E-06	0.197		3.193E-06	0.203	
<i>Daphnia magna</i>	5.258E-06	0.334		5.268E-06	0.335		5.254E-06	0.334		5.304E-06	0.337		5.463E-06	0.347	
<i>Ceriodaphnia dubia</i>	4.008E-06	0.255		4.016E-06	0.255		4.004E-06	0.254		4.040E-06	0.257		4.160E-06	0.264	
BLM test organism	Dissolved copper LC50 generated with BLM for Upper Fish Creek @ 20.5°C - using predicted maximums														
	Year 1-16 LC50		Predicted max	Year 17-20 LC50		Predicted max	Year 21-30 LC50		Predicted max	Year 31-47 LC50		Predicted max	Year 48-100 LC50		Predicted max
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.901E-05	1.208	0.0043	1.878E-05	1.193	0.0034	1.820E-05	1.157	0.0024	1.969E-05	1.251	0.0083	1.957E-05	1.244	0.0076
<i>Daphnia pulex</i>	3.335E-06	0.212		3.319E-06	0.211		3.269E-06	0.208		3.501E-06	0.222		3.475E-06	0.221	
<i>Daphnia magna</i>	5.650E-06	0.359		5.625E-06	0.357		5.554E-06	0.353		5.939E-06	0.377		5.900E-06	0.375	
<i>Ceriodaphnia dubia</i>	4.323E-06	0.275		4.303E-06	0.273		4.243E-06	0.270		4.544E-06	0.289		4.512E-06	0.287	

Table 14. Dissolved copper LC₅₀ for Trib 1 @ 20.5 °C

BLM test organism	Dissolved copper LC50 generated with BLM for Trib 1 @ 20.5 °C - using predicted averages														
	Year 1-16 LC50		Predicted avg	Year 17-20 LC50		Predicted avg	Year 21-30 LC50		Predicted avg	Year 31-47 LC50		Predicted avg	Year 48-100 LC50		Predicted avg
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.671E-05	1.062	0.002	1.673E-05	1.063	0.002	1.665E-05	1.058	0.002	1.680E-05	1.068	0.002	1.731E-05	1.100	0.003
<i>Daphnia pulex</i>	3.083E-06	0.196		3.089E-06	0.196		3.078E-06	0.196		3.103E-06	0.197		3.184E-06	0.202	
<i>Daphnia magna</i>	5.25E-06	0.334		5.27E-06	0.335		5.26E-06	0.334		5.30E-06	0.337		5.45E-06	0.346	
<i>Ceriodaphnia dubia</i>	4.005E-06	0.255		4.017E-06	0.255		4.004E-06	0.254		4.039E-06	0.257		4.148E-06	0.264	
BLM test organism	Dissolved copper LC50 generated with BLM for Trib 1 @ 20.5°C - using predicted maximums														
	Year 1-16 LC50		Predicted max	Year 17-20 LC50		Predicted max	Year 21-30 LC50		Predicted max	Year 31-47 LC50		Predicted max	Year 48-100 LC50		Predicted max
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.892E-05	1.202	0.004	1.847E-05	1.174	0.003	1.837E-05	1.167	0.003	1.999E-05	1.270	0.008	1.988E-05	1.263	0.007
<i>Daphnia pulex</i>	3.327E-06	0.211		3.294E-06	0.209		3.288E-06	0.209		3.513E-06	0.223		3.487E-06	0.222	
<i>Daphnia magna</i>	5.640E-06	0.358		5.592E-06	0.355		5.584E-06	0.355		5.958E-06	0.379		5.918E-06	0.376	
<i>Ceriodaphnia dubia</i>	4.315E-06	0.274		4.274E-06	0.272		4.267E-06	0.271		4.558E-06	0.290		4.527E-06	0.288	

Table 15. Dissolved cadmium LC₅₀ for Upper Fish Creek @ 10 °C

BLM test organism	Dissolved cadmium LC50 - Upper Fish Creek - 10°C - using predicted averages														
	Year 1-16 LC50		Predicted avg	Year 17-20 LC50		Predicted avg	Year 21-30 LC50		Predicted avg	Year 31-47 LC50		Predicted avg	Year 48-100 LC50		Predicted avg
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.216E-07	0.01367	0.00009	1.310E-07	0.01473	0.00009	1.324E-07	0.01488	0.00009	1.548E-07	0.01740	0.00009	2.098E-07	0.02358	0.0001
<i>Ceriodaphnia dubia</i>	2.592E-06	0.2914		2.801E-06	0.3149		2.801E-06	0.3149		3.262E-06	0.3667		4.376E-06	0.49191	
BLM test organism	Dissolved cadmium LC50 - Upper Fish Creek - 10°C - using predicted maximums														
	Year 1-16 LC50		Predicted max	Year 17-20 LC50		Predicted max	Year 21-30 LC50		Predicted max	Year 31-47 LC50		Predicted max	Year 48-100 LC50		Predicted max
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.717E-07	0.01930	0.00014	1.791E-07	0.02013	0.00013	1.797E-07	0.02020	0.00011	3.367E-07	0.03785	0.00013	3.229E-07	0.03630	0.00013
<i>Ceriodaphnia dubia</i>	3.655E-06	0.41086		3.765E-06	0.42323		3.765E-06	0.42323		7.068E-06	0.79452		6.781E-06	0.76226	

Table 16. Dissolved cadmium LC₅₀ for Trib 1 @ 10 °C

BLM test organism	Dissolved cadmium LC50 - Trib 1 - 10°C - using predicted averages														
	Year 1-16 LC50		Predicted avg	Year 17-20 LC50		Predicted avg	Year 21-30 LC50		Predicted avg	Year 31-47 LC50		Predicted avg	Year 48-100 LC50		Predicted avg
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.230E-07	0.01383	0.00009	1.348E-07	0.01515	0.00009	1.356E-07	0.01524	0.00009	1.514E-07	0.01702	0.00009	2.009E-07	0.02258	0.0001
<i>Ceriodaphnia dubia</i>	2.636E-06	0.2963		2.884E-06	0.32419		2.884E-06	0.32419		3.181E-06	0.3576		4.189E-06	0.47089	
BLM test organism	Dissolved cadmium LC50 Trib 1 - 10°C - using predicted maximums														
	Year 1-16 LC50		Predicted max	Year 17-20 LC50		Predicted max	Year 21-30 LC50		Predicted max	Year 31-47 LC50		Predicted max	Year 48-100 LC50		Predicted max
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.731E-07	0.01946	0.00014	1.814E-07	0.02039	0.00013	1.828E-07	0.02055	0.00011	3.366E-07	0.03784	0.00012	3.194E-07	0.03590	0.00012
<i>Ceriodaphnia dubia</i>	3.70E-06	0.41558		3.806E-06	0.42784		3.806E-06	0.42784		7.064E-06	0.79407		6.721E-06	0.75551	

Table 17. Dissolved cadmium LC₅₀ for Upper Fish Creek @ 20.5 °C

BLM test organism	Dissolved cadmium LC50 - Upper Fish Creek - 20.5°C - using predicted averages														
	Year 1-16 LC50		Predicted avg	Year 17-20 LC50		Predicted avg	Year 21-30 LC50		Predicted avg	Year 31-47 LC50		Predicted avg	Year 48-100 LC50		Predicted avg
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.212E-07	0.01362	0.00009	1.305E-07	0.01467	0.00009	1.320E-07	0.01484	0.00009	1.544E-07	0.01736	0.00009	2.096E-07	0.02356	0.0001
<i>Ceriodaphnia dubia</i>	2.590E-06	0.2911		2.793E-06	0.3140		2.793E-06	0.3140		3.258E-06	0.3662		4.378E-06	0.49214	
BLM test organism	Dissolved cadmium LC50 - Upper Fish Creek - 20.5°C - using predicted maximums														
	Year 1-16 LC50		Predicted max	Year 17-20 LC50		Predicted max	Year 21-30 LC50		Predicted max	Year 31-47 LC50		Predicted max	Year 48-100 LC50		Predicted max
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.711E-07	0.01923	0.00014	1.785E-07	0.02007	0.00013	1.792E-07	0.02014	0.00011	3.371E-07	0.03789	0.00013	3.233E-07	0.03634	0.00013
<i>Ceriodaphnia dubia</i>	3.647E-06	0.40996		3.758E-06	0.42244		3.758E-06	0.42244		7.095E-06	0.79756		6.805E-06	0.76496	

Table 18. Dissolved cadmium LC₅₀ for Trib 1 @ 20.5 °C

BLM test organism	Dissolved cadmium LC50 - Trib 1 - 20.5°C - using predicted averages														
	Year 1-16 LC50		Predicted avg	Year 17-20 LC50		Predicted avg	Year 21-30 LC50		Predicted avg	Year 31-47 LC50		Predicted avg	Year 48-100 LC50		Predicted avg
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.226E-07	0.01378	0.00009	1.344E-07	0.01511	0.00009	1.352E-07	0.01520	0.00009	1.510E-07	0.01697	0.00009	2.006E-07	0.02255	0.0001
<i>Ceriodaphnia dubia</i>	2.629E-06	0.2955		2.878E-06	0.32352		2.878E-06	0.32352		3.176E-06	0.3570		4.190E-06	0.47100	
BLM test organism	Dissolved cadmium LC50 Trib 1 - 20.5°C - using predicted maximums														
	Year 1-16 LC50		Predicted max	Year 17-20 LC50		Predicted max	Year 21-30 LC50		Predicted max	Year 31-47 LC50		Predicted max	Year 48-100 LC50		Predicted max
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.725E-07	0.01939	0.00014	1.809E-07	0.02034	0.00013	1.823E-07	0.02049	0.00011	3.370E-07	0.03788	0.00012	3.197E-07	0.03594	0.00012
<i>Ceriodaphnia dubia</i>	3.69E-06	0.41480		3.801E-06	0.42727		3.801E-06	0.42727		7.090E-06	0.79699		6.743E-06	0.75799	

Table 19. Dissolved silver LC₅₀ for Upper Fish Creek @ 10 °C

BLM test organism	Dissolved silver LC50 - Upper Fish Creek - 10°C - using predicted averages														
	Year 1-16 LC50		Predicted avg	Year 17-20 LC50		Predicted avg	Year 21-30 LC50		Predicted avg	Year 31-47 LC50		Predicted avg	Year 48-100 LC50		Predicted avg
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.255E-07	0.01354	0.000119	1.246E-07	0.01344	0.000118	1.237E-07	0.01334	0.000117	1.233E-07	0.01330	0.000103	1.215E-07	0.01311	0.000103
<i>Daphnia magna</i>	9.376E-09	0.001		9.312E-09	0.001		9.247E-09	0.001		9.220E-09	0.001		9.074E-09	0.00098	
BLM test organism	Dissolved silver LC50 - Upper Fish Creek - 10°C - using predicted maximums														
	Year 1-16 LC50		Predicted max	Year 17-20 LC50		Predicted max	Year 21-30 LC50		Predicted max	Year 31-47 LC50		Predicted max	Year 48-100 LC50		Predicted max
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.354E-07	0.01461	0.000388	1.344E-07	0.0145	0.000387	1.305E-07	0.01408	0.000387	1.282E-07	0.01383	0.000348	1.289E-07	0.0139	0.000355
<i>Daphnia magna</i>	1.012E-08	0.00109		1.004E-08	0.00108		9.742E-09	0.00105		9.570E-09	0.00103		9.630E-09	0.00104	

Table 20. Dissolved silver LC₅₀ for Trib 1 @ 10 °C

BLM test organism	Dissolved silver LC50 - Trib 1 - 10°C - using predicted averages														
	Year 1-16 LC50		Predicted avg	Year 17-20 LC50		Predicted avg	Year 21-30 LC50		Predicted avg	Year 31-47 LC50		Predicted avg	Year 48-100 LC50		Predicted avg
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.254E-07	0.01353	0.00012	1.243E-07	0.01341	0.00011	1.234E-07	0.01331	0.00011	1.234E-07	0.01331	0.00011	1.219E-07	0.01315	0.00011
<i>Daphnia magna</i>	9.363E-09	0.001		9.295E-09	0.001		9.227E-09	0.001		9.227E-09	0.001		9.102E-09	0.00098	
BLM test organism	Dissolved silver LC50 Trib 1 - 10°C - using predicted maximums														
	Year 1-16 LC50		Predicted max	Year 17-20 LC50		Predicted max	Year 21-30 LC50		Predicted max	Year 31-47 LC50		Predicted max	Year 48-100 LC50		Predicted max
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.345E-07	0.01451	0.00039	1.325E-07	0.01429	0.00039	1.309E-07	0.01412	0.00039	1.305E-07	0.01408	0.00039	1.310E-07	0.01413	0.00039
<i>Daphnia magna</i>	1.01E-08	0.00108		9.900E-09	0.00107		9.777E-09	0.00105		9.748E-09	0.00105		9.788E-09	0.00106	

Table 21. Dissolved silver LC₅₀ for Upper Fish Creek @ 20.5 °C

BLM test organism	Dissolved silver LC50 - Upper Fish Creek - 20.5°C - using predicted averages														
	Year 1-16 LC50		Predicted avg	Year 17-20 LC50		Predicted avg	Year 21-30 LC50		Predicted avg	Year 31-47 LC50		Predicted avg	Year 48-100 LC50		Predicted avg
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.240E-07	0.01338	0.000119	1.232E-07	0.01329	0.000118	1.225E-07	0.01321	0.000117	1.220E-07	0.01316	0.000103	1.201E-07	0.01295	0.000103
<i>Daphnia magna</i>	9.271E-09	0.001		9.212E-09	0.001		9.155E-09	0.001		9.117E-09	0.0010		8.973E-09	0.00097	
BLM test organism	Dissolved silver LC50 - Upper Fish Creek - 20.5°C - using predicted maximums														
	Year 1-16 LC50		Predicted max	Year 17-20 LC50		Predicted max	Year 21-30 LC50		Predicted max	Year 31-47 LC50		Predicted max	Year 48-100 LC50		Predicted max
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.324E-07	0.01428	0.000388	1.317E-07	0.01421	0.000387	1.283E-07	0.01384	0.000387	1.261E-07	0.01360	0.000348	1.267E-07	0.01367	0.000355
<i>Daphnia magna</i>	9.895E-09	0.00107		9.841E-09	0.00106		9.575E-09	0.00103		9.414E-09	0.00102		9.464E-09	0.00102	

Table 22. Dissolved silver LC₅₀ for Trib 1 @ 20.5 °C

BLM test organism	Dissolved silver LC50 - Trib 1 - 20.5 °C - using predicted averages														
	Year 1-16 LC50		Predicted avg	Year 17-20 LC50		Predicted avg	Year 21-30 LC50		Predicted avg	Year 31-47 LC50		Predicted avg	Year 48-100 LC50		Predicted avg
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.239E-07	0.01336	0.00012	1.230E-07	0.01327	0.00011	1.222E-07	0.01318	0.00011	1.220E-07	0.01316	0.00011	1.205E-07	0.013	0.00011
<i>Daphnia magna</i>	9.257E-09	0.001		9.193E-09	0.00099		9.135E-09	0.00099		9.123E-09	0.001		9.001E-09	0.00097	
BLM test organism	Dissolved silver LC50 Trib 1 - 20.5°C - using predicted maximums														
	Year 1-16 LC50		Predicted max	Year 17-20 LC50		Predicted max	Year 21-30 LC50		Predicted max	Year 31-47 LC50		Predicted max	Year 48-100 LC50		Predicted max
	mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L		mol/L	mg/L	
Rainbow Trout	1.316E-07	0.0142	0.00039	1.300E-07	0.01402	0.00039	1.286E-07	0.01387	0.00039	1.281E-07	0.01382	0.00039	1.286E-07	0.01387	0.00039
<i>Daphnia magna</i>	9.84E-09	0.00106		9.708E-09	0.00105		9.610E-09	0.00104		9.568E-09	0.00103		9.604E-09	0.00104	

A1.7 BLM results for Mixing Points (BEECE, TASEKO, LOWER FISH CREEK AND WASP)

A1.7.1 Copper

Copper modelling was completed for the Wasp, Lower Fish Creek and Taseko mixing points only, as no predicted exceedances of the water quality guidelines for copper were identified at Beece Creek. With the exception of maximum copper concentrations at Taseko 1, the predicted copper concentrations for the mixing points were below the LC₅₀ for *Daphnia pulex*, which is the most sensitive test organism to copper in the BLM (Table 23). Although maximum copper concentrations exceeded the corresponding LC₅₀ values at Taseko 1, the average concentrations were below their corresponding LC₅₀ values. A baseline average pH of 6.99 was used for the Taseko 1 station and this value was calculated using a subset of the pH data concurrent with temperatures $\geq 10^{\circ}\text{C}$. This approach was taken for conservatism and to remain within the confines of the BLM input ranges. However, this appears to overestimate the potential for exceedances of the BLM generated LC₅₀. Using the entire pH baseline dataset from the closest historical Taseko River station, we found an average pH of 7.39 (consistent with the mean lab pH of 7.4 reported for all historical Taseko sampling stations between 1992 and 2007)⁶. Using this pH value, the predicted average and maximum values are below the BLM generated LC₅₀ (Table 24).

A1.7.2 Cadmium

Cadmium modelling was completed for all of the mixing points, emphasizing Rainbow Trout, which is the most sensitive test organism to cadmium in the BLM (Tables 25 and 26). None of the predicted values exceeded the LC₅₀ values generated by the BLM. Predicted values were ≥ 59 times lower than the corresponding LC₅₀ for cadmium in modelled waterbodies.

A1.7.3 Silver

Silver modelling was completed for the Wasp and Lower Fish Creek mixing points only, as no exceedances of the water quality guidelines for silver were identified for the remaining stations (Table 27). None of the predicted values exceeded the LC₅₀ values generated by the BLM. Predicted values were ≥ 9.9 times lower than the corresponding LC₅₀ for silver in modelled waterbodies.

⁶ See Taseko Prosperity Gold-Copper Project, VOLUME 5: BIOTIC ENVIRONMENT, SECTION 2: WATER QUALITY AND AQUATIC ECOLOGY, BASELINE REPORT, April 2007. Appendix 5-2-A, Appendix Table B9-2: Summary for Taseko River, All Sites and All Dates, 1992 to 2007

Table 23. Dissolved copper LC₅₀ at the Wasp, Lower Fish Creek and Taseko Mixing Points – range of average and maximum values

Test organism	WASP LC ₅₀ - dissolved copper - 10°C											
	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred max	mol/L	mg/L	Pred max
Daphnia pulex	4.87E-06	0.3096	0.0015	5.44E-06	0.34544	0.0107	4.96E-06	0.31487	0.0018	6.04E-06	0.38356	0.0223
	LOWER FISH CREEK 1 LC ₅₀ -dissolved cadmium - 12.84°C						LOWER FISH CREEK 2 LC ₅₀ -dissolved cadmium - 11.52°C					
	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred max
	3.17E-06	0.2014	0.0104	3.18E-06	0.20208	0.0104	3.01E-06	0.19146	0.01181	3.01E-06	0.19146	0.0118
	LOWER FISH CREEK 1 LC ₅₀ -dissolved cadmium - 20.5°C						LOWER FISH CREEK 2 LC ₅₀ -dissolved cadmium -20.5°C					
	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred max
	3.48E-06	0.2212	0.0104	3.49E-06	0.22197	0.0104	3.47E-06	0.22050	0.01181	3.47E-06	0.2205	0.0118
	TASEKO 1 LC ₅₀ -dissolved copper - 12.19°C											
	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred max	mol/L	mg/L	Pred max
	6.88E-08	0.0044	0.0029	6.88E-08	0.0044	0.0029	6.89E-08	0.0044	0.0049	6.89E-08	0.0044	0.0049
	TASEKO 3 LC ₅₀ -dissolved copper - 12.18°C											
	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred max	mol/L	mg/L	Pred max
	1.42E-07	0.009	0.0029	1.42E-07	0.009	0.0029	1.42E-07	0.009	0.0049	1.42E-07	0.009	0.0049

Table 24. Dissolved copper LC₅₀ at the Taseko 1 mixing point – pH of 7.39

Test organism	TASEKO 1 LC ₅₀ -dissolved copper - 12.19°C - pH of 7.39			
	mol/L	mg/L	Pred avg	Pred max
<i>Daphnia pulex</i>	1.204E-07	0.0077	0.0029	0.0049
	TASEKO 1 LC ₅₀ -dissolved copper - 10°C - pH of 7.39			
	mol/L	mg/L	Pred avg	Pred max
	1.198E-07	0.0076	0.0029	0.0049

Table 25. Dissolved cadmium LC₅₀ at the Wasp, Beece, Lower Fish Creek and Taseko Mixing Points – range of average and maximum values

Test organism	WASP LC ₅₀ - dissolved cadmium - 20°C											
	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred max	mol/L	mg/L	Pred max
Rainbow Trout	2.63E-07	0.02956	0.000041	5.26E-07	0.0591	0.000293	2.71E-07	0.0305	0.000050	4.84E-07	0.0544	0.000389
	BEECE LC ₅₀ - dissolved cadmium - 12.19°C											
	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred max	mol/L	mg/L	Pred max
	1.31E-08	0.0015	0.000025	1.31E-08	0.0015	0.000025	1.75E-08	0.00197	0.000025	1.76E-08	0.00198	0.000025
	TASEKO 1 LC ₅₀ -dissolved cadmium - 12.19°C											
	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred max	mol/L	mg/L	Pred max
	1.70E-08	0.0019	0.000025	1.70E-08	0.0019	0.000025	1.82E-08	0.002	0.000025	1.82E-08	0.002	0.000025
	Taseko 3 LC50 -dissolved cadmium - 12.18°C											
	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred max	mol/L	mg/L	Pred max
	1.83E-08	0.0021	0.000025	1.84E-08	0.0021	0.000026	1.31E-08	0.0015	0.000025	1.92E-08	0.0022	0.000029
	LOWER FISH CREEK 1 LC ₅₀ -dissolved cadmium - 12.84°C						LOWER FISH CREEK 2 LC ₅₀ -dissolved cadmium - 11.52°C					
	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred max	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred max
	2.59E-07	0.0291	0.00033	2.61E-07	0.0294	0.000359	2.87E-07	0.0322	0.00034	2.89E-07	0.0325	0.000359

Table 26. Dissolved cadmium LC₅₀ at the Beece, Lower Fish Creek and Taseko Mixing Points (maximum baseline temperatures)

Test organism	BEECE LC ₅₀ - dissolved cadmium - 13°C											
	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred max	mol/L	mg/L	Pred max
Rainbow Trout	1.31E-08	0.00147	0.000025	1.31E-08	0.00147	0.000025	1.75E-08	0.00197	0.000025	1.76E-08	0.00198	0.000025
	TASEKO 1 LC ₅₀ -dissolved cadmium - 15°C											
	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred max	mol/L	mg/L	Pred max
	1.70E-08	0.00191	0.000025	1.70E-08	0.00191	0.000025	1.82E-08	0.00204	0.000025	1.82E-08	0.00204	0.000025
	Taseko 3 LC ₅₀ -dissolved cadmium - 15°C											
	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred max	mol/L	mg/L	Pred max
	1.83E-08	0.0021	0.000025	1.84E-08	0.0021	0.000026	1.96E-08	0.0022	0.000025	1.92E-08	0.0022	0.000029
	LOWER FISH CREEK 1 LC ₅₀ -dissolved cadmium - 20.5°C						LOWER FISH CREEK 2 LC ₅₀ -dissolved cadmium - 20.5°C					
	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred max	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred max
	2.59E-07	0.0291	0.00033	2.61E-07	0.0294	0.000359	2.87E-07	0.0322	0.00034	2.89E-07	0.0325	0.000359

Table 27. Dissolved silver LC₅₀ at the Wasp and Lower Fish Creek Mixing Points

Test organism	WASP LC ₅₀ - dissolved silver - 20°C											
	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred max	mol/L	mg/L	Pred max
<i>Daphnia magna</i>	1.01E-08	0.0011	0.00011	1.03E-08	0.00111	0.00016	1.06E-08	0.00114	0.00016	1.11E-08	0.0012	0.00017
	LOWER FISH CREEK 1 LC ₅₀ - dissolved silver - 12.84°C						LOWER FISH CREEK 2 LC ₅₀ - dissolved silver - 11.52°C					
	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred max	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred max
	9.60E-09	0.0010	0.0001	9.60E-09	0.00104	0.0001	9.66E-09	0.00104	0.000114	9.66E-09	0.00104	0.000114
	LOWER FISH CREEK 1 LC ₅₀ - dissolved silver - 20.5°C						LOWER FISH CREEK 2 LC ₅₀ - dissolved silver -20.5°C					
	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred max	mol/L	mg/L	Pred avg	mol/L	mg/L	Pred max
	9.42E-09	0.0010	0.0001	9.42E-09	0.00102	0.0001	9.44E-09	0.00102	0.000114	9.44E-09	0.00102	0.000114

APPENDIX A1 – BLM INPUT DATA FROM STOCHASTIC MODELLING – FISH LAKE, UPPER FISH CREEK AND TRIBUTARY 1

FISH LAKE PREDICTED WATER QUALITY - mg/L

Parameter (avg and max for phase)	Year 1-16	Year 17-20	Year 21-30	Year 31-47	Year 48-100
alkalinity (avg)	119.237	112.448	108.610	106.613	103.017
alkalinity (max)	162.832	141.176	131.461	130.080	130.146
cadmium (avg)	0.000098	0.000093	0.000085	0.000089	0.000093
cadmium (max)	0.000135	0.000126	0.000102	0.000110	0.000114
calcium (avg)	24.987	26.841	24.876	31.806	54.255
calcium (max)	41.500	43.140	40.975	77.371	72.856
chloride (avg)	1.566	1.430	1.230	1.371	1.348
chloride (max)	2.784	2.425	1.892	1.968	2.056
copper (avg)	0.0025	0.0019	0.0012	0.0015	0.0028
copper (max)	0.0052	0.0037	0.0016	0.0048	0.0045
magnesium (avg)	14.972	14.360	13.835	14.260	15.636
magnesium (max)	20.723	18.380	17.226	17.733	18.926
nitrate (avg)	0.018	0.011	0.013	0.020	0.025
nitrate (max)	0.039	0.018	0.029	0.043	0.041
potassium (avg)	2.127	2.088	1.913	2.234	3.169
potassium (max)	3.646	3.280	2.925	4.207	4.205
sodium (avg)	12.023	11.715	10.850	11.319	10.771
sodium (max)	19.274	17.450	16.416	16.204	16.570
silver (avg)	0.000110	0.000109	0.000107	0.000101	0.000100
silver (max)	0.000195	0.000187	0.000188	0.000184	0.000158
sulphate (avg)	25.035	30.096	24.414	44.832	106.546
sulphate (max)	64.301	70.950	61.948	173.068	158.305

**APPENDIX A1 – BLM INPUT DATA FROM STOCHASTIC MODELLING – FISH LAKE,
UPPER FISH CREEK AND TRIBUTARY 1**

UPPER FISH CREEK PREDICTED WATER QUALITY - mg/L

Parameter (avg and max for phase)	Year 1-16	Year 17-20	Year 21-30	Year 31-47	Year 48-100
alkalinity (avg)	119.144	114.920	111.819	107.202	103.550
alkalinity (max)	170.181	161.743	143.611	132.735	134.098
cadmium (avg)	0.00009	0.00009	0.00009	0.00009	0.00010
cadmium (max)	0.00014	0.00013	0.00011	0.00013	0.00013
calcium avg	23.295	26.434	26.889	35.061	57.931
calcium max	43.206	45.829	45.577	124.495	113.368
chloride (avg)	1.431	1.373	1.271	1.417	1.395
chloride (max)	2.952	2.626	2.224	2.061	2.204
copper (avg)	0.0018	0.0017	0.0016	0.0019	0.0032
copper (max)	0.0043	0.0034	0.0024	0.0083	0.0076
magnesium (avg)	14.862	14.703	14.444	14.678	16.135
magnesium (max)	21.272	19.604	18.144	20.226	20.378
nitrate (avg)	0.015	0.012	0.016	0.024	0.028
nitrate (max)	0.039	0.025	0.034	0.070	0.067
potassium (avg)	2.073	2.142	2.079	2.393	3.351
potassium (max)	4.098	4.124	4.187	6.019	5.713
sodium (avg)	12.018	11.872	11.309	11.448	10.895
sodium (max)	20.827	20.883	17.741	16.485	16.960
silver (avg)	0.000119	0.000118	0.000117	0.000103	0.000103
silver (max)	0.000388	0.000387	0.000387	0.000348	0.000355
sulphate (avg)	18.539	27.289	28.720	53.596	116.466
sulphate (max)	67.150	78.132	74.025	307.315	272.427

Ca above BLM range – used 120.24 mg/L
(upper limit of model)

Sulphate above BLM range – used 278.4 mg/L
(upper limit of model)

**APPENDIX A1 – BLM INPUT DATA FROM STOCHASTIC MODELLING – FISH LAKE,
UPPER FISH CREEK AND TRIBUTARY 1**

TRIB 1 PREDICTED WATER QUALITY - mg/L

Parameter (avg and max for phase)	Year 1-16	Year 17-20	Year 21-30	Year 31-47	Year 48-100
alkalinity (avg)	118.187	113.559	110.647	108.953	106.470
alkalinity (max)	166.721	150.628	147.023	141.975	144.226
cadmium (avg)	0.00009	0.00009	0.00009	0.00009	0.00010
cadmium (max)	0.00014	0.00013	0.00011	0.00012	0.00012
calcium avg	23.816	27.757	27.963	33.772	54.039
calcium max	43.759	46.630	46.904	122.120	111.657
chloride (avg)	1.448	1.389	1.274	1.388	1.391
chloride (max)	2.869	2.534	2.207	2.358	2.416
copper (avg)	0.002	0.002	0.002	0.002	0.003
copper (max)	0.004	0.003	0.003	0.008	0.007
magnesium (avg)	14.808	14.667	14.437	14.821	16.114
magnesium (max)	21.135	19.086	18.636	20.007	20.583
nitrate (avg)	0.015	0.013	0.017	0.023	0.027
nitrate (max)	0.039	0.024	0.036	0.069	0.062
potassium (avg)	2.083	2.176	2.110	2.386	3.235
potassium (max)	4.096	4.160	4.246	5.883	5.660
sodium (avg)	0.00012	0.00011	0.00011	0.00011	0.00011
sodium (max)	0.00039	0.00039	0.00039	0.00039	0.00039
silver (avg)	11.874	11.744	11.156	11.503	11.220
silver (max)	20.183	19.069	18.491	18.151	18.678
sulphate (avg)	20.690	31.610	32.158	49.289	104.665
sulphate (max)	68.713	80.553	77.438	301.309	267.681

Ca above BLM range – used 120.24 mg/L
(upper limit of model)

Sulphate above BLM range – used 278.4 mg/L
(upper limit of model)

APPENDIX A2 – BLM INPUT DATA FROM MIXING POINTS MODELLING AND AVAILABLE BASELINE DATA – WASP, BEECE, TASEKO, LOWER FISH CREEK

WASP LAKE PREDICTED WATER QUALITY - mg/L					
Parameter (avg and max for phase)	Year 1-16	Year 17 - 20	Year 21- 30	Year 31- 47	Year 48- 100
alkalinity (avg)	96.033	111.309	201.584	201.581	249.423
alkalinity (max)	192.760	515.631	648.177	506.625	509.020
cadmium (avg)	0.000041	0.000050	0.000293	0.000124	0.000122
cadmium (max)	0.000050	0.000051	0.000389	0.000388	0.000191
calcium avg	25.571	30.636	321.005	124.039	146.013
calcium max	30.904	31.673	426.993	426.036	190.398
chloride (avg)	2.028	2.321	2.482	2.876	2.901
chloride (max)	2.356	2.397	4.427	5.143	4.103
copper (avg)	0.0015	0.0018	0.0028	0.0107	0.0108
copper (max)	0.0018	0.0018	0.0180	0.0223	0.0177
magnesium (avg)	16.181	19.002	42.046	20.998	23.781
magnesium (max)	19.238	19.583	52.452	52.355	28.541
nitrate (avg)	0.048	0.058	0.069	0.130	0.132
nitrate (max)	0.058	0.060	0.219	0.266	0.209
potassium (avg)	2.405	2.860	3.331	6.130	6.143
potassium (max)	2.889	2.952	10.203	12.335	9.440
silver (avg)	0.00014	0.00016	0.00016	0.00011	0.00011
silver (max)	0.00016	0.00016	0.00017	0.00016	0.00013
sodium (avg)	4.292	5.398	15.998	6.791	7.747
sodium (max)	5.435	5.572	20.346	20.291	9.539
sulphate (avg)	2.482	4.882	35.334	303.000	304.363
sulphate (max)	4.608	5.651	515.631	648.177	506.625

Shaded cells – substituted max values from the BLM for modelled concentrations outside of the upper range of the BLM

- 360 mg/L input for alkalinity
- 120.24 mg/L input for calcium
- 50.8 mg/L input for magnesium
- 278.4 mg/L input for sulphate

BEECE CREEK PREDICTED WATER QUALITY - mg/L

Parameter (avg and max for phase)	Year 1-16	Year 17 - 20	Year 21- 30	Year 31- 47	Year 48- 100
alkalinity (avg)	18.574	18.553	18.570	18.574	18.717
alkalinity (max)	20.579	20.579	20.579	20.579	21.346
cadmium (avg)	0.000025	0.000025	0.000025	0.000025	0.000025
cadmium (max)	0.000025	0.000025	0.0000251	0.0000251	0.000025
calcium avg	5.948	5.936	5.962	5.954	6.867
calcium max	8.944	8.944	9.023	9.009	8.453
chloride (avg)	0.52191	0.52137	0.52191	0.52288	0.52274
chloride (max)	0.600202	0.600206	0.601859	0.601197	0.601030
magnesium (avg)	1.296	1.292	1.296	1.296	1.538
magnesium (max)	2.053	2.053	2.060	2.059	1.974
potassium (avg)	0.18232	0.18233	0.18257	0.18487	0.18486
potassium (max)	0.230053	0.230056	0.230388	0.238575	0.234798
sodium (avg)	1.857	1.850	1.856	1.857	2.189
sodium (max)	3.000	3.000	3.003	3.003	2.780
sulphate (avg)	2.855	2.860	2.866	2.989	2.991
sulphate (max)	4.000	4.000	4.273	4.973	4.790

TASEKO 1 - mg/L					
Parameter (avg and max for phase)	Year 1-16	Year 17 - 20	Year 21- 30	Year 31- 47	Year 48- 100
alkalinity (avg)	18.401	18.381	18.397	18.401	18.396
alkalinity (max)	20.042	20.042	20.042	20.042	20.042
cadmium (avg)	0.00003	0.00003	0.00003	0.00003	0.00003
cadmium (max)	0.000025	0.000025	0.000025	0.000025	0.000025
calcium avg	8.642	8.642	8.642	8.642	8.708
calcium max	9.495	9.495	9.495	9.495	9.270
chloride (avg)	0.646	0.643	0.646	0.646	0.645
chloride (max)	0.880	0.880	0.880	0.880	0.880
copper (avg)	0.00286	0.00291	0.00287	0.00286	0.00287
copper (max)	0.004888	0.004888	0.004888	0.004888	0.004888
magnesium (avg)	1.181	1.183	1.181	1.180	1.205
magnesium (max)	1.422	1.422	1.422	1.422	1.422
potassium (avg)	0.572	0.572	0.572	0.572	0.572
potassium (max)	0.643	0.643	0.643	0.643	0.643
sodium (avg)	1.070	1.069	1.070	1.070	1.050
sodium (max)	1.202	1.202	1.202	1.202	1.113
sulphate (avg)	6.659	6.662	6.660	6.660	6.661
sulphate (max)	7.981	7.981	7.981	7.982	7.982

TASEKO 3 - mg/L					
Parameter (avg and max for phase)	Year 1-16	Year 17 - 20	Year 21-30	Year 31-47	Year 48-100
alkalinity (avg)	18.574	18.553	18.570	18.574	18.717
alkalinity (max)	20.579	20.579	20.579	20.579	21.346
cadmium (avg)	0.0000250	0.0000250	0.0000250	0.0000250	0.0000257
cadmium (max)	0.0000250	0.0000250	0.0000250	0.0000250	0.0000285
calcium avg	8.642	8.642	8.642	8.642	8.708
calcium max	9.495	9.495	9.496	9.496	9.270
chloride (avg)	0.646	0.643	0.645	0.646	0.652
chloride (max)	0.878	0.878	0.878	0.878	0.911
copper (avg)	0.00286	0.00290	0.00287	0.00286	0.00289
copper (max)	0.00488	0.00488	0.00488	0.00488	0.00490
magnesium (avg)	1.181	1.183	1.181	1.181	1.205
magnesium (max)	1.422	1.422	1.422	1.422	1.422
potassium (avg)	0.573	0.573	0.573	0.573	0.583
potassium (max)	0.644	0.644	0.644	0.644	0.646
sodium (avg)	1.070	1.069	1.070	1.070	1.050
sodium (max)	1.202	1.202	1.202	1.202	1.113
sulphate (avg)	6.646	6.649	6.647	6.647	7.081
sulphate (max)	7.955	7.955	7.955	7.956	8.975

Parameter (avg and max for phase)	LOWER FISH CREEK 1 (mg/L)	LOWER FISH CREEK 2 (mg/L)
	Year 48-100	Year 48-100
alkalinity (avg)	154.410	154.392
alkalinity (max)	173.091	173.074
cadmium (avg)	0.00033	0.00034
cadmium (max)	0.000359	0.000359
calcium avg	78.946	80.044
calcium max	91.240	91.219
chloride (avg)	3.464	3.463
chloride (max)	3.799	3.798
copper (avg)	0.01040	0.01040
copper (max)	0.01181	0.01180
magnesium (avg)	23.089	23.296
magnesium (max)	25.097	25.094
nitrate (avg)	0.143	0.143
nitrate (max)	0.273	0.273
potassium (avg)	5.262	5.260
potassium (max)	5.885	5.884
silver (avg)	0.00010	0.00010
silver (max)	0.000114	0.000114
sodium (avg)	12.830	12.945
sodium (max)	14.778	14.776
sulphate (avg)	180.205	180.152
sulphate (max)	217.358	217.295

Parameter	Fish Creek 1	Fish Creek 2	Beece	Taseko 1	Taseko 3	Wasp
pH	7.88	8.08	7.36	6.99 /7.39	7.36	8.5
temperature	12.84	11.52	12.19	12.19	12.18	10
DOC (or TOC)	12.46	9.85	0.84	1.06	1.3	13.37
Sulfide	1.00E-10	1.00E-10	1.00E-10	1.00E-10	1.00E-10	1.00E-10