

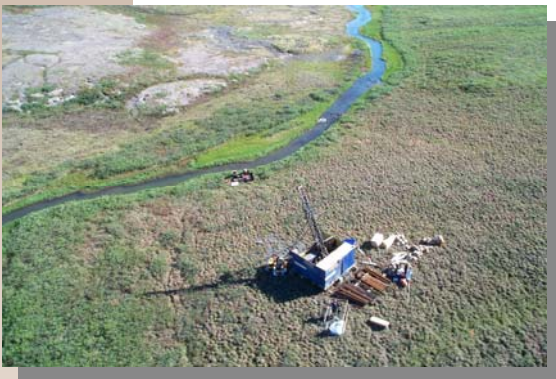
Tail Lake Water Quality Model

Doris North Project, Hope Bay Nunavut, Canada



Prepared for:

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SRK Project No. 1CM014.006

October 2005

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1 Introduction

1.1 Terms of Reference

SRK Consulting (Canada) Inc. (SRK) was commissioned by Miramar Hope Bay Limited (MHBL) to develop a water balance and water quality model for the proposed Doris North Project. The objectives of the model include:

- Estimating tailings water volume storage requirements and hence containment dam design requirements;
- Assessing contaminant release to the water contained in the tailings storage area;
- Developing a water management strategy for the tailings storage area; and
- Evaluating possible downstream impacts due to water releases from the tailings storage area.

This report provides an overview of the water balance and the integration of contaminant load calculations into the water balance model to estimate water quality for the tailings storage facility. This report supersedes the previous water and load balance calculations that were prepared in 2003 and in 2004 (SRK 2003a, d). The water and load balance presented herein in many respects builds on the previous work but also addresses issues that have been raised in the past. The calculations presented herein substantially rely on hydrological (including precipitation and surface runoff estimates), background water quality and geochemical (including ore and waste rock properties and leachability, as well as treated process water quality) information provided by others, as noted in the report.

The report is organized as follows. Chapter two presents the development of the overall water balance for the tailings storage area. Chapter three presents and discusses the assumptions and calculations that were adopted for the water quality and load balance calculations. Chapter four presents and discusses potential water management strategies or scenarios for the tailings storage area. Chapter five presents the modelling results and discusses implications for each of the scenarios modelled. Conclusions and recommendations are presented in Chapter six.

1.2 Background

MHBL plans to construct and operate a short-life underground gold mine (the “Doris North Project”), on Inuit Owned Land about 160 km southwest of Cambridge Bay in the West Kitikmeot Region in Nunavut, and is 5 km south of the Arctic Coast. The nearest communities are Umingmaktok 65 km west and Bathurst Inlet 110 km southwest.

MBHL is proposing to extract about 458,000 tonnes of ore from an underground mine. The ore will be processed at a rate of 668 tonnes per day to yield 306,830 ounces of gold over a 24-month

operating period. The mine entrance will be close to the ore processing plant and other surface facilities.

A site plan of the surface facilities is shown in Figure 1.1.

Ore will be trucked to a surface stockpile, crushed and conveyed to an ore stockpile and then fed to a single ball mill. The slurry output from the ball mill will pass through a gravity concentrator to recover the “free milling” gold. Approximately 40% of the gold in the ore will be recovered by gravity. The balance of the gold will be extracted by physical separation of the minerals that contain the gold and then extracting the gold by chemical leaching.

To achieve physical separation, the slurry output from the gravity circuit will be subjected to a froth flotation process to recover gold bearing sulphide minerals in a flotation concentrate. The flotation circuit will reduce the material for further processing to approximately 67 tonnes per day (10% of original ore processed). The remaining 90% (~601 TPD) will be discharged to the tailings impoundment with no further treatment.

The gold in the flotation concentrate will be extracted by conventional agitated tank leaching using dilute cyanide in a carbon-in-leach circuit. Activated carbon, added to the concentrate during the leaching process, will adsorb the dissolved gold and will then be separated from the cyanide leach slurry using screens or sieves. The gold will then be recovered from the gold bearing carbon and plated onto wire wool cathodes using an electrowinning method.

The stripped carbon will be regenerated and returned to the carbon-in-leach circuit to recover more gold. The slurry from the cyanide leach circuit will be treated using the Caro’s Acid process to decompose the residual cyanide. The treated leach slurry from the cyanide circuit will then be added to the flotation tailings slurry and pumped by pipeline to Tail Lake. When practical, water will be reclaimed from Tail Lake as mill process water.

A spreadsheet based model was developed to estimate total flows to and from Tail Lake and to estimate changes in water quality in Tail Lake as a result of tailings deposition, and in the downstream receiving environment, resulting from potential water management strategies identified for the Doris North Project.

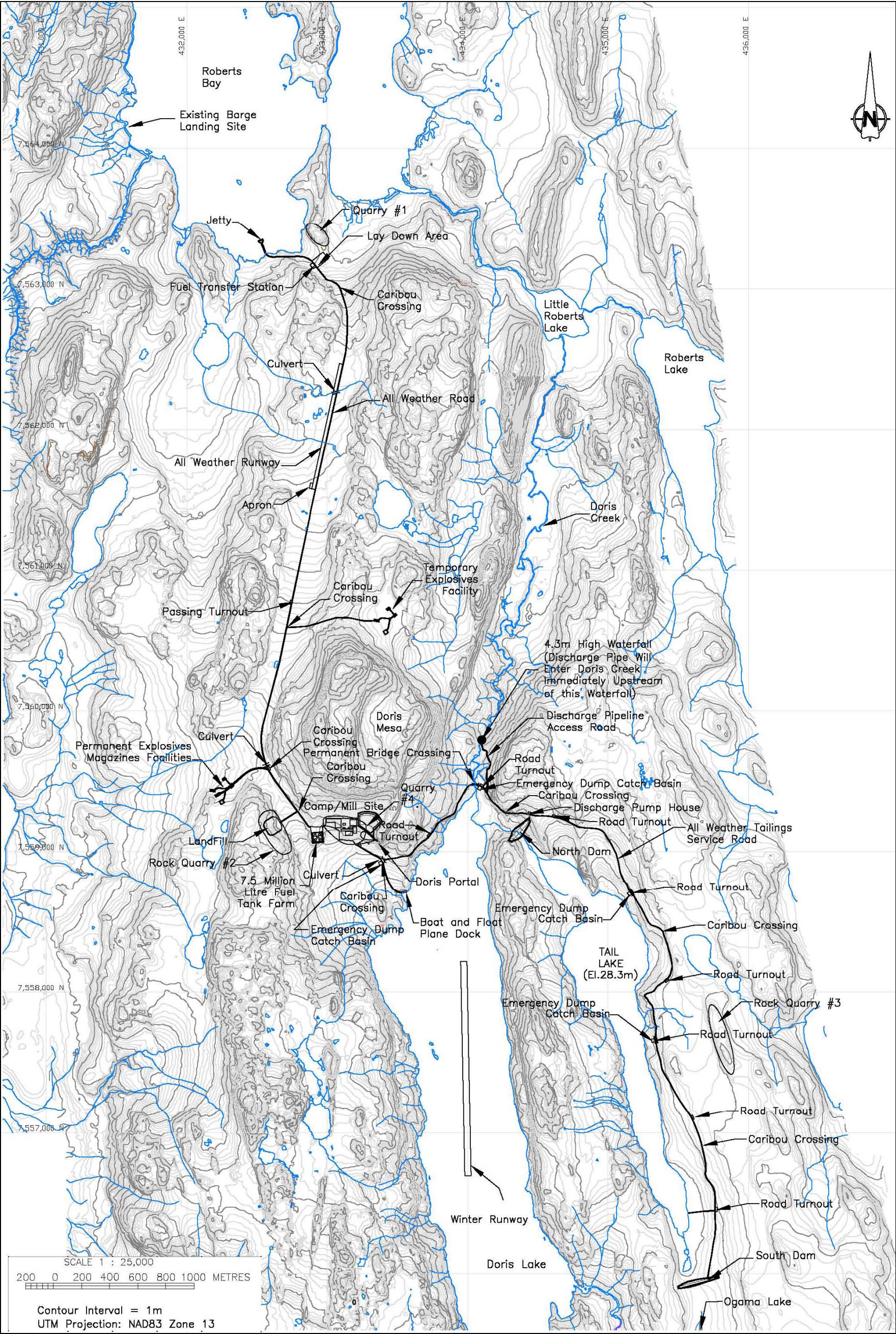


Figure 1.1: Doris North Project Site Facilities Layout

2 Tailings Impoundment Water Balance

2.1 General

This section describes the Tail Lake tailings impoundment water balance. This water balance has been used in conjunction with other relevant technical data to determine the design height of the impoundment containment dams and to form the basis for the Tail Lake water quality predictions, during operational, closure and post-closure periods.

A detailed description of the water balance calculation, the underlying assumptions and the data sources used are documented. This water balance was originally presented in SRK (2003a); however, based on new updated hydrology data, this water balance has been completely revised and this therefore replaces in its entirety any previous Tail Lake water balance.

2.2 Input Assumptions

Conservative, but reasonable engineering assumptions have been made to develop a realistic water balance for the tailings impoundment. Some of the basic assumptions are;

- Tail Lake will be completely isolated with respect to surface and groundwater from the adjoining Doris Lake and Ogama Lake catchments by two water retaining structures; the North and South Dams respectively.
- Tailings deposition will be sub-aqueous and will be managed such that the final tailings surface will be relatively horizontal.
- Tail Lake will not be pumped out prior to constructing the dams or starting deposition. The volume of Tail Lake at its normal full supply elevation of 28.3 m is $\sim 2,196,000 \text{ m}^3$.
- Annual decant release from the tailings impoundment are anticipated; however, the tailings impoundment area is designed to accommodate full containment (tailings and all natural runoff) for the two-year mine life (at a constant production rate), plus an additional period of natural runoff after mining ceases.
- The impact of varying climate and hydrology on the water balance is illustrated with a sensitivity analysis.
- The water balance is calculated in monthly time steps. The water balance calculations use a year that starts in March and ends in February. When dates are quoted, the starting condition is always based on March 2006.
- All values in this water balance are expressed in terms of the dam full supply level (FSL). It should be noted that at any time there will be a 3.5 m freeboard height above the FSL, which serves as thermal and wave run-up protection.

2.3 Water Balance Calculation

The tailings impoundment has a total surface catchment area of 450 ha. A bathymetric survey of Tail Lake (Rescan 2001) and a topographical survey of the catchment were used to develop a stage curve for the tailings impoundment, as illustrated in Figure 2.1.

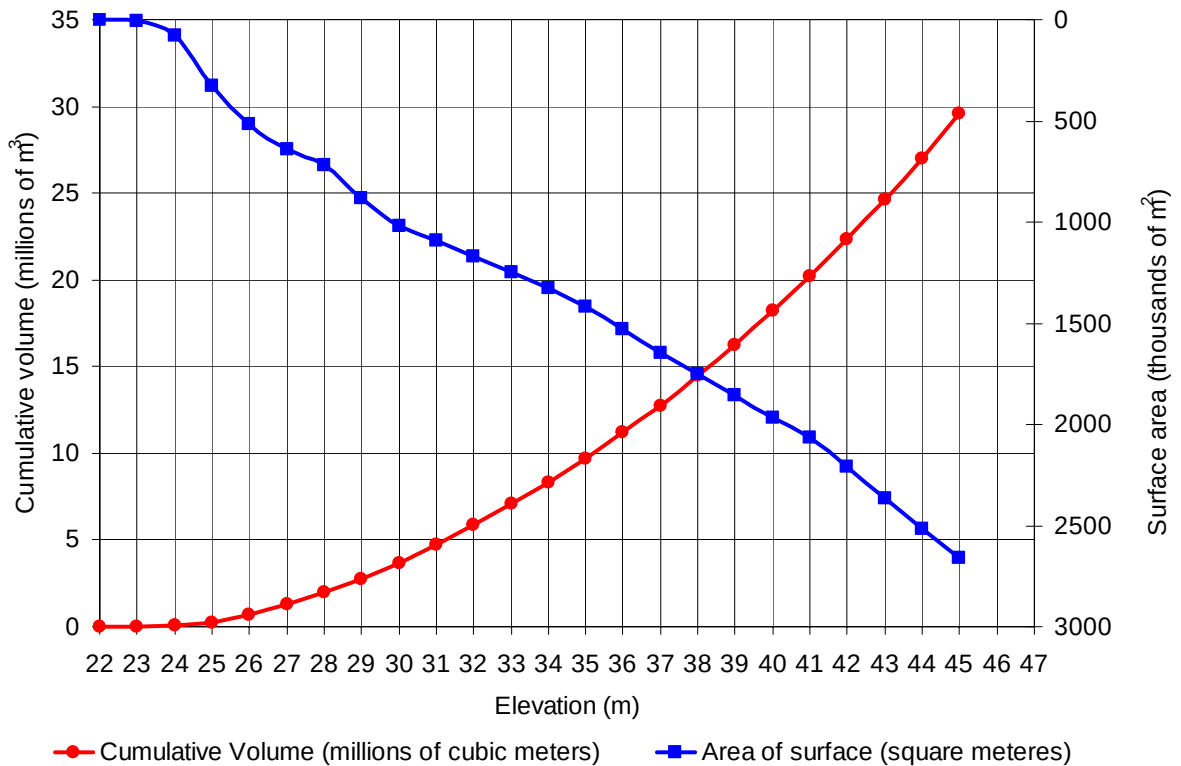


Figure 2.1: Stage Curve for Tail Lake

The best-fit mathematical expressions for the Tail Lake tailings impoundment surface area and storage volume, expressed in terms of the lake water elevation are respectively given as:

$$V = -0.00020 \cdot h^3 + 0.07354 \cdot h^2 - 2.94811 \cdot h + 31.26314 \quad \dots(2.1)$$

$$A = 0.32656 \cdot h^6 - 67.95719 \cdot h^5 + 5829.42586 \cdot h^4 - 263467.30709 \cdot h^3 + 6607466.03356 \cdot h^2 - 86950808.77770 \cdot h + 467883520.90250 \quad \dots(2.2)$$

In addition an expression for the lake water elevation, expressed in terms of the total lake storage volume is given as:

$$h = -1.18740 \times 10^{-42} \cdot V^6 + 1.13280 \times 10^{-34} \cdot V^5 - 4.17315 \times 10^{-27} \cdot V^4 + 7.47625 \times 10^{-20} \cdot V^3 - 6.83698 \times 10^{-13} \cdot V^2 + 3.72593 \times 10^{-6} \cdot V + 2.28955 \times 10^1 \quad \dots(2.3)$$

Where V = tailings impoundment pond storage volume (m³),
A = tailings impoundment pond surface area (m²), and
h = tailings pond elevation (m).

The tailings dam water balance is schematically illustrated in Figure 2.2. The water balance is calculated in monthly time steps using the following expression:

$$\Delta S = Q_1 - Q_2 + Q_3 + Q_4 - Q_5 - Q_6 \pm Q_7 + Q_8 + Q_9 \quad \dots(2.4)$$

Where ΔS = change in Tail Lake storage volume (m³),
Q₁ = volume of direct precipitation falling onto Tail Lake (m³),
Q₂ = volume of potential evaporation from Tail Lake (m³),
Q₃ = volume runoff entering Tail Lake (m³),
Q₄ = volume of tailings feed pumped to Tail Lake (m³),
Q₅ = volume of reclaim water pumped back to mill (m³),
Q₆ = volume of decant allowed from Tail Lake (m³),
Q₇ = volume of dam(s) seepage pumped back to Tail Lake (m³),
Q₈ = volume of sewage water treatment sludge pumped to Tail Lake (m³), and
Q₉ = volume of underground mine water pumped to Tail Lake (m³).

The individual components Q₁, Q₂, and Q₃ are calculated as follows:

$$Q_1 = (A_{lake})P \quad \dots(2.5)$$

$$Q_2 = (A_{lake})PE \quad \dots(2.6)$$

$$Q_3 = (A_{catchment} - A_{lake})Y \quad \dots(2.7)$$

Where A_{lake} = surface area of Tail Lake (m²),
A_{catchment} = total area of Tail Lake catchment (m²),
P = total precipitation (m),
PE = potential evaporation (m), and
Y = water yield (m³).

The total precipitation (P) is calculated as follows:

$$P = R + S \quad \dots(2.8)$$

Where R = total rainfall (m), and
S = total snowfall water equivalent (m).

The tailings feed volume, Q₄, is calculated as follows:

$$Q_4 = Q_{10} + Q_{11} \quad \dots(2.9)$$

$$Q_{10} = \frac{F}{\rho_d} \quad \dots(2.10)$$

$$\rho_d = \frac{G_s}{(1 + e)} \quad \dots(2.11)$$

$$Q_{11} = \frac{F}{\omega} \cdot (100 - \omega) \quad \dots(2.12)$$

Where Q_{10} = the volume of tailings solids (m^3),
 Q_{11} = the volume of water entrained in the tailings slurry (m^3),
 F = the tailings slurry feed (tonnes/day),
 ρ_d = the tailings solids dry density (tonnes/ m^3),
 G_s = the tailings solids specific gravity,
 e = the tailings void ratio for hydraulically placed tailings under water (-), and
 ω = the tailings slurry feed solids (by weight) content (%).

Tail Lake seepage Q_7 is calculated as follows:

$$Q_7 = Q_{12} + Q_{13} - Q_{14} \quad \dots(2.13)$$

Where Q_{12} = volume of seepage pumped back from the North Dam (m^3),
 Q_{13} = volume of seepage pumped back from the South Dam (m^3), and
 Q_{14} = volume of seepage lost to deep deep recharge (m^3).

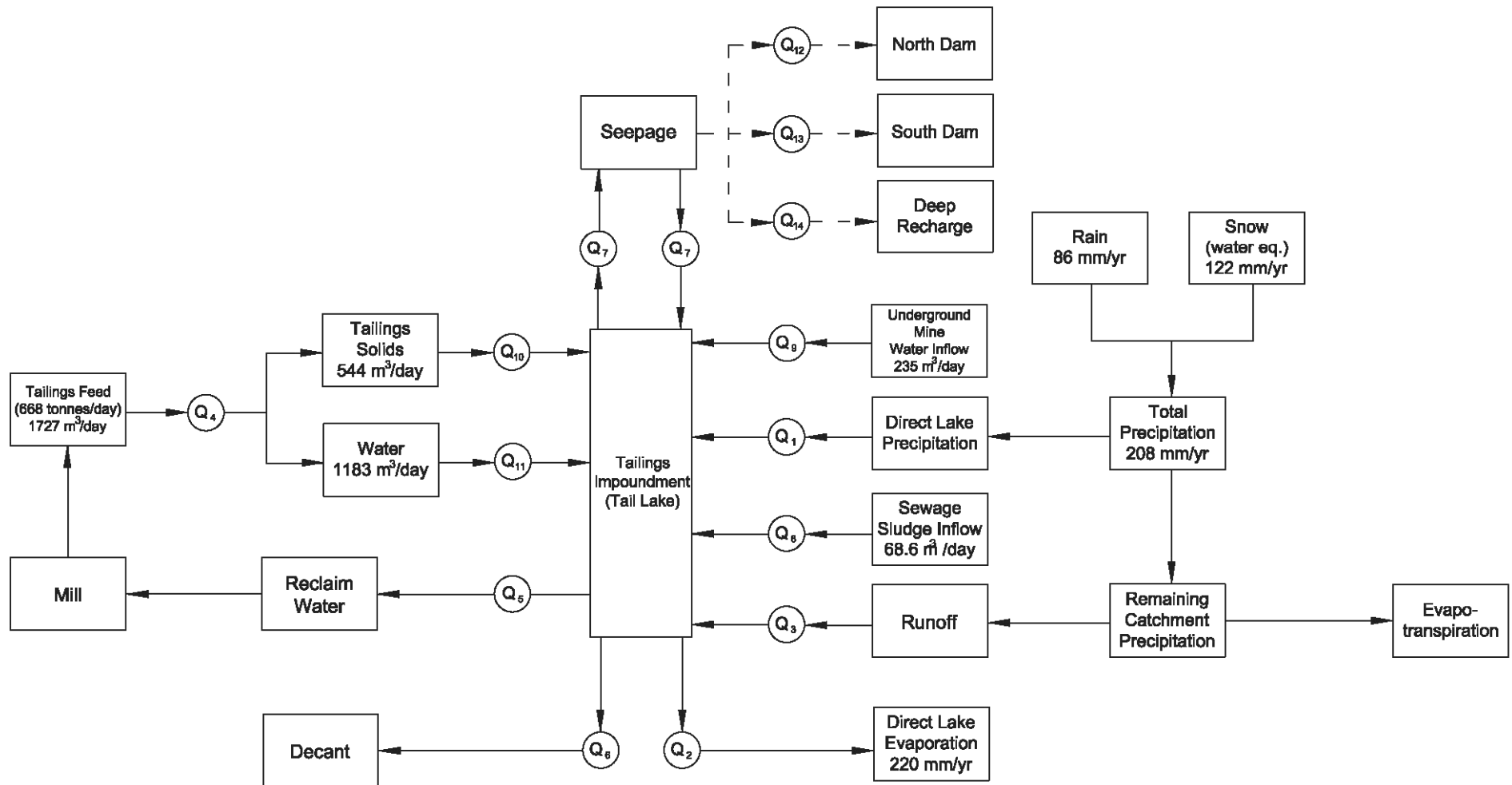


Figure 2.2: Tailings Dam Water Balance

2.4 Water Balance Data Set

The following section describes how each of the water balance components mentioned was generated and applied for use in the water balance calculation.

2.4.1 Total Precipitation

AMEC (2003b) developed a detailed metrological and hydrological baseline for the Doris North Project, specifically targeting the Tail Lake and Doris Lake catchments. This document was used for the primary climatic data in the water balance. The mean monthly rainfall, snowfall (water equivalent) and total precipitation data extracted from AMEC (2003b) is reproduced as Table 2.1.

Table 2.1: Mean Monthly Rainfall, Snow Water Equivalent and Total Precipitation

Month	Rainfall (mm)	Snowfall – Water Equivalent (mm)	Total Precipitation (mm)
January	0.0	8.0	8.0
February	0.0	8.4	8.4
March	0.0	10.8	10.8
April	0.1	11.8	11.9
May	3.2	12.5	15.7
June	13.7	3.6	17.3
July	24.2	0.2	24.4
August	29.0	1.9	30.9
September	14.4	12.5	26.9
October	1.2	25.8	27.0
November	0.0	14.4	14.4
December	0.0	11.6	11.6
Annual	85.8	121.5	207.3

MHBL (2005) presents a detailed discussion of the meteorological and hydrology data with respect to possible variances from the baseline. That information will not be reproduced in this report; however, the impact of those variations had been thoroughly tested in a series of water balance variations.

With respect to mean annual precipitation (MAP), an increased value of 225 mm was suggested, and this value was subsequently used in the sensitivity analysis for the water balance.

In general the water balance is conducted using average climatic year data; however, it is recognized that extreme events can affect the outcome. The water balance sensitivity analysis therefore includes an evaluation of extreme wet and dry years. These extreme events are documented in MHBL (2005).

2.4.2 Potential Lake Evaporation

AMEC (2003b) did an extensive evaluation of the limited lake evaporation data for Doris North and developed the data set reproduced in Table 2.2, which was used in the water balance calculation to establish Q_3 in Equation 2.7. MHBL (2005) documents, that for sensitivity analysis, it would be appropriate to alter the evaporation to $\pm 20\%$ of this value, i.e. varying the evaporation between 176 and 264 mm.

Table 2.2: Doris North Project Average Monthly and Annual Lake Evaporation

Period	Days with Evaporation	Average Evaporation (mm)
June	15	35
July	31	95
August	31	77
September	30	13
Annual	105	220

2.4.3 Runoff/Water Yield

AMEC (2003b) documents the annual outflow from Doris and Tail Lake. Based on this data they determined the annual water yield (runoff from the catchment) for Tail Lake to be 111 mm, and 134 mm for Doris Lake. MHBL (2005) presents a detailed discussion on water yield, and concludes that the water yield could be as much as 180 mm/yr. For the purpose of the water balance presented in this report the base case water yield was conservatively assumed to be 180 mm, and the effect of the lower water yield was evaluated through sensitivity analysis.

2.4.4 Seepage

Seepage from the tailings impoundment can be via three primary routes; North Dam, South Dam and deep recharge through the lake basin. In reality, the North and South Dams will be frozen core dams, which should not have any seepage. Furthermore, in the event that seepage was to occur, MHBL would intercept this seepage and return it to Tail Lake.

It was however considered appropriate to estimate what this seepage may be, such that an evaluation could be made as the potential effect that it may have on the water balance. Since the seepage rates at any of these points cannot be physically measured at this stage, first order seepage calculations were made using the D'arcy equation (Holtz and Kovacs 1981):

$$q = k \cdot i_{\text{north / south}} \cdot A = k \cdot \frac{\Delta h_{\text{north / south}}}{L_{\text{north / south}}} \cdot A \quad \dots(2.14)$$

$$A = d_{\text{unfrozen}} \times w_{\text{unfrozen}} \quad \dots(2.15)$$

$$\Delta h_{\text{north / south}} = h_{\text{max}} - h_{\text{north / south}} \quad \dots(2.16)$$

$$L_{north / south} = d_{crest} \cdot (\Delta h_{north / south} \times S_u) \cdot (\Delta h_{north / south} \times S_d) \quad \dots(2.17)$$

Where q = seepage flow rate (m^3/s),
 k = tailings permeability (m/s),
 $i_{north/south}$ = hydraulic gradient for North or South dam respectively (-),
 A = seepage area (m^2),
 $\Delta h_{north/south}$ = change in headloss for North and South dam respectively (m),
 $L_{north/south}$ = Length of seepage zone for North and South dam respectively (m).

Table 2.3 lists the assumed constants for the theoretical seepage calculations. The resultant seepage rates for each potential seep are listed in Table 2.4. The permeability used for these calculations are an average, maximum or minimum value to provide a range of seepage results. These permeability values are based on typical gold tailings data.

Table 2.3: Assumed Constants Used in the Simplified Seepage Calculations

Parameter	Symbol	Value
Maximum tailings impoundment water level	h_{max}	33.5m above sea level
North dam foundation elevation	h_{north}	26.5m above sea level
South dam foundation elevation	h_{south}	32.0m above sea level
Assumed thickness of "unfrozen" zone	$d_{unfrozen}$	15 m
Assumed width of "unfrozen" zone	$w_{unfrozen}$	35 m
Dam crest width	d_{crest}	10 m
Upstream Dam slope	$1:S_u$	6 (i.e. 1 vertical:6 horizontal)
Downstream Dam slope	$1:S_d$	4 (i.e. 1 vertical:4 horizontal)
Average tailings permeability	$k_{s(avg)}$	1×10^{-5} m/sec
Minimum tailings permeability	$k_{s(min)}$	1×10^{-6} m/sec
Maximum tailings permeability	$k_{s(max)}$	1×10^{-4} m/sec

Table 2.4: Estimated Seepage Rates through North and South Dams

Condition	North Dam (m^3/day)	South Dam (m^3/day)	Total (m^3/day)
Minimum	6	1	7
Average	61	13	74
Maximum	607	137	744

The deep recharge component refers to the potential for deep recharge via the foundation materials of the tailings impoundment, i.e. Tail Lake. The intact permeability of these foundation materials was measured by SRK using packer tests (SRK 2003a). The average hydraulic conductivity was 9.9×10^{-12} m/sec. The reason for this low permeability was twofold; the ground was frozen, and the bedrock was not fractured.

In calculating the deep seepage an assumption has been made that the pool size is constant at 131 ha (the surface area covered by Tail Lake at FSL), the hydraulic gradient is constant at 1, and foundation permeabilities are as follows; average = 9.9×10^{-12} m/s; minimum = 9.9×10^{-13} m/s; maximum = 9.9×10^{-11} m/s. The resultant deep recharge rates are listed in Table 2.5.

Table 2.5: Estimated Deep Recharge Rates for Tail Lake

Condition	Deep Recharge (m ³ /day)
Minimum	0.1
Average	1.1
Maximum	11.1

The average condition theoretical seepage calculations described above have been used in the tailings impoundment water balance. It was however assumed that all seepage from the North and South Dams would be intercepted and pumped back to the tailings impoundment. The average deep seepage rate is so low that it has been omitted from any water balance calculations. Since the impoundment is designed for full containment, this was deemed to be conservative.

2.4.5 Tailings Slurry Feed

The average constant tailings production rate will be 668 tonnes/day at a solids moisture content of 36.1%, a solids specific gravity of 2.7 and a submerged in-place tailings void ratio of 1.2. This will result in a daily slurry feed of 1,727 m³ (544 m³/day solids and 1,183 m³/day water).

2.4.6 Reclaim Water

Tail Lake is relatively shallow, and it is possible that during the winter months increased turbidity may be experienced as a result of a reduced water volume in the lake created by the freezing conditions (lake-ice). Consequently, 100% recirculation water (1,183 m³/day) is assumed for four months of the year only (June through September). During the remainder of the year fresh water make-up will be from Doris Lake.

2.4.7 Sewage Sludge Volume

The sewage treatment plant outflow and sludge will be pumped to the tailings impoundment as part of the tailings feed stream. This volume of sludge is dependant of the size of the camp. For the purpose of this water balance calculation we have assumed a 175-man camp, for a total sewage treatment plant load of ~ 68.6 m³/day (value supplied by MHBL).

2.4.8 Underground Volume

Mining at the Doris North Project will exploit the Doris Hinge reserves, which are located north of Doris Lake. There is known permafrost in this region, and therefore it would be reasonable to assume that water make-up in the mine would be negligible.

SRK (2003e) documents the results of a scoping level geohydrological model for a mining scenario where the Doris Connector and Doris Central sections are exploited. Under this scenario, mining will move underneath Doris Lake and it is conceivable that there could be an inflow of water into the mine. This inflow has been estimated to average 235 m³/day.

Although the two-year Doris North project would in all likelihood not experience any mine water inflow (SRK 2005a), a conservative assumption has been made that a mine inflow of 235m³/day would occur for the life of the project. This water would be captured in the mine and pumped to Tail Lake.

2.4.9 Decant Rate

Baseline hydrology prepared by AMEC (2003b) confirmed that flow from Tail and Doris Lakes only occurs during the period June through October. Any outflow from Tail Lake will flow into Doris Lake, immediately upstream from Doris Creek.

As described in the remainder of this report, a tailings management strategy is presented that would allow annual discharge from Tail Lake directly into Doris Creek, at a location immediately upstream of a 4.3 m high waterfall. The details of the water management strategy will not be discussed here; however, the discharge will be linked to the Doris Creek outflow hydrograph, as presented by AMEC (2003b), with updated values in MHL (2005).

This water balance was developed prior to finalization of the discharge strategy; however, the effect of various discharge strategies was evaluated in a sensitivity analysis.

2.5 Water Balance Results

The primary purpose of the water balance was to determine an appropriate height for the containment dams, such that there would be sufficient storage capacity in Tail Lake. Therefore, the water balance was initially applied for an arbitrary period of 25 years. During this time the facility was kept as a full containment facility, and the height of containment dams to retain this volume was calculated. This 25 year period, includes two years of mining. The results of this analysis are presented in Table 2.6.

Table 2.6: Required FSL for Full Containment over 25 years

Scenario	MAP (mm)	Evap. (mm)	Water Yield (mm)	Extreme Events	Recycle (months)	Mine Water (m ³ /day)	Required FSL (m)
Base Case (#1)	207	220	180	Mean	4	235	39.4
#2	225	220	180	Mean	4	235	39.7
#3	207	220	111	Mean	4		36.4
#4	207	176	180	Mean	4	235	40.1
#5	207	264	180	Mean	4	235	38.7
#6	207	220	180	Yr 1 = 1:500 Wet	4	235	39.7
#7	207	220	180	Yr 1 = 1:500 Wet; Yr 2 = 1:100 Wet	4	235	39.8
#8	207	220	180	Yr 1 = 1:100 Dry	4	235	39.3
#9	207	220	180	Yr 1 = 1:100 Dry; Yr 2 = 1:100 Dry	4	235	39.1
#10	207	220	180	Mean	0	235	39.5
#11	207	220	180	Mean	12	235	39.2
#12	207	220	180	Mean	4	0	39.3

Table 2.7 list the required FSL in Tail Lake at different times, as calculated using the Base Case (Scenario #1) input parameters. Through an iterative procedure, and in consultation with MHBL, it was determined that an optimal design FSL in Tail Lake would be 33.5 m. Based on that water level, a sensitivity analysis was completed to illustrate the time to overflow. These results are presented in Table 2.8.

Table 2.7: Base Case (Scenario #1) Required FSL at Different Time Intervals

Time Interval	Required FSL (m)
25 years	39.4
20 years	38.1
15 years	36.4
10 years	34.1
5 years	32.5

Table 2.8: Calculated Decant Time based on a Design FSL of 33.5 m (Start Date is March 2006)

Scenario	Decant Time (Date)	Decant Time (Years/Months from Start)
Base Case (#1)	August 2013	7 years, 5 months
#2	July 2013	7 years, 4 months
#3	July 2018	12 years, 4 months
#4	December 2012	6 years, 9 months
#5	July 2014	8 years, 4 months
#6	July 2012	6 years, 4 months
#7	August 2011	5 years, 5 months
#8	July 2014	8 years, 4 months
#9	October 2014	8 years, 6 months
#10	May 2013	7 years, 2 months
#11	July 2014	8 years, 4 months
#12	January 2014	7 years, 10 months

The effect of decanting water from Tail Lake on the water level in Tail Lake is illustrated in Table 2.9 below. As the volume of annual decant is increased the time until the FSL is reached is increased. At some point the discharge is greater than the annual inflow and the FSL will not be reached. If the annual discharge is greater than the annual inflow, the water level in Tail Lake would decrease over time.

Table 2.9: Effect of Decant on the Base Case (Scenario #1)

Decant Scenario	Decant Time (Date)	Comment
100,000 m ³ /year	June 2015	This is more than 9 years before FSL is reached
250,000 m ³ /year	July 2019	This is more than 13 years before FSL is reached
500,000 m ³ /year	Likely Never	Max. water level of 33.0m reached after 42 years
750,000 m ³ /year	Likely Never	Max. water level of 29.9m reached June 2008; Water level drops to 28.3 by August 2017
1,000,000 m ³ /year	Likely Never	Max. water level of 29.4m reached June 2008; Water level drops to 28.3 by September 2008

The water balance illustrated that an operating FSL of 33.5 m for Tail Lake would be appropriate. Under the most conservative water balance assumptions, Tail Lake can operate as a zero discharge facility for just under 5½ years before reaching FSL. Using more realistic water balance assumptions Tail Lake can operate as a zero discharge facility for at least 7½ years.

The water balance also clearly illustrates that, by allowing an annual discharge the time to reach FSL in Tail Lake is dramatically increased. Allowing as little as 100,000 m³/year of discharge increases the time to FSL under the base case (Scenario #1) to just under 9½ years, which is an 27% increase in time. If the annual discharge is 500,000 m³/year, FSL in Tail Lake will likely not be reached, since the decant rate will exceed the annual inflow. Appendix A list a series of sample calculations for the base case water balance.

3 Water Quality Model

3.1 Model Description

The water balance, identifying all the sources contributing to Tail Lake and to Doris Lake, is shown schematically in Figure 3.1. The overall water balance integrates the tailings discharge water balance developed for the Tailings Impoundment Design (Chapter 2) with the receiving environment.

The potential sources that may contribute to solute release from the site comprise:

- Quarried rock used as road base, turn-out areas, mill site pad area fill and other infrastructure construction fill;
- Mine waste rock stored on surface for the duration of mining (after which it will be backfilled to the underground workings);
- Ore stockpiled during milling operations;
- Wall rocks and waste rock backfill in the underground workings during mining operations, contributing to the loadings in water recovered from the underground workings;
- Saline drilling fluids, contributing to the loadings in water recovered from the underground workings;
- Blasting residues (from explosives) present in quarried construction rock, waste rock in storage, and in ore;
- Treated sewage discharged to Tail Lake;
- Treated mill tailings discharged to Tail Lake;
- Solute and suspended matter released to Tail Lake from shoreline erosion and re-suspension by wave action; and
- Salinity released to Tail Lake due to thawing where permafrost is present, along the shores of Tail Lake.

As part of the stormwater management strategy (SRK 2005b), the runoff from the mill site including runoff from the fill, waste rock in storage and the ore stockpile, will be collected and pumped with the tailings to Tail Lake. Thus, solute released from these sources will report directly to Tail Lake.

Solute released from road base materials and fill used for infrastructure development will report directly to either Doris Lake or Tail Lake, depending on its catchment.

Losses in saline drilling fluids that will be used during mining will report to the mine water recovered during the dewatering of the underground workings, as will any solute released from the mine wall rocks and waste rock backfilled to the underground workings during operations. The mine

water will be pumped directly to Tail Lake. It should be noted that since the mine is not expected to require any dewatering, this is conservative.

Blast residues will be present in all quarried rock, waste rock and ore produced at the site, and will contribute loadings to Doris Lake and Tail Lake as described above. As well, blast residues and spilled explosives will contribute nutrients to the mine water.

Treated sewage, together with the mill tailings will be pumped to Tail Lake.

As the water level rises, permafrost in the banks of Tail Lake will thaw. The porewater from the thawed banks, which will be saline, will be released to Tail Lake only once a hydraulic gradient develops to displace the pore water. This will occur once the water level in Tail Lake is lowered.

Some of the contaminants such as cyanide and its derivative compounds (e.g. thiocyanide, cyanate) will be subject to natural degradation reactions where they combine with water and oxygen. These reactions will lead to the formation of nutrients (e.g. ammonia, nitrite and nitrate) which themselves will be subject to nutrient degradation reactions to form innocuous nitrogen. The water quality prediction model has been developed to also address these reactions.

The load balance calculations are based on conservation of mass. The model does not include the potential effects of equilibration reactions that could lead to the formation of secondary minerals, which, in some cases, would result in a net removal of solutes from solution, acting as a solute sink. Solute concentrations for these parameters would therefore be overestimated. The calculation methods for each of the sources are presented and discussed in the following sections.

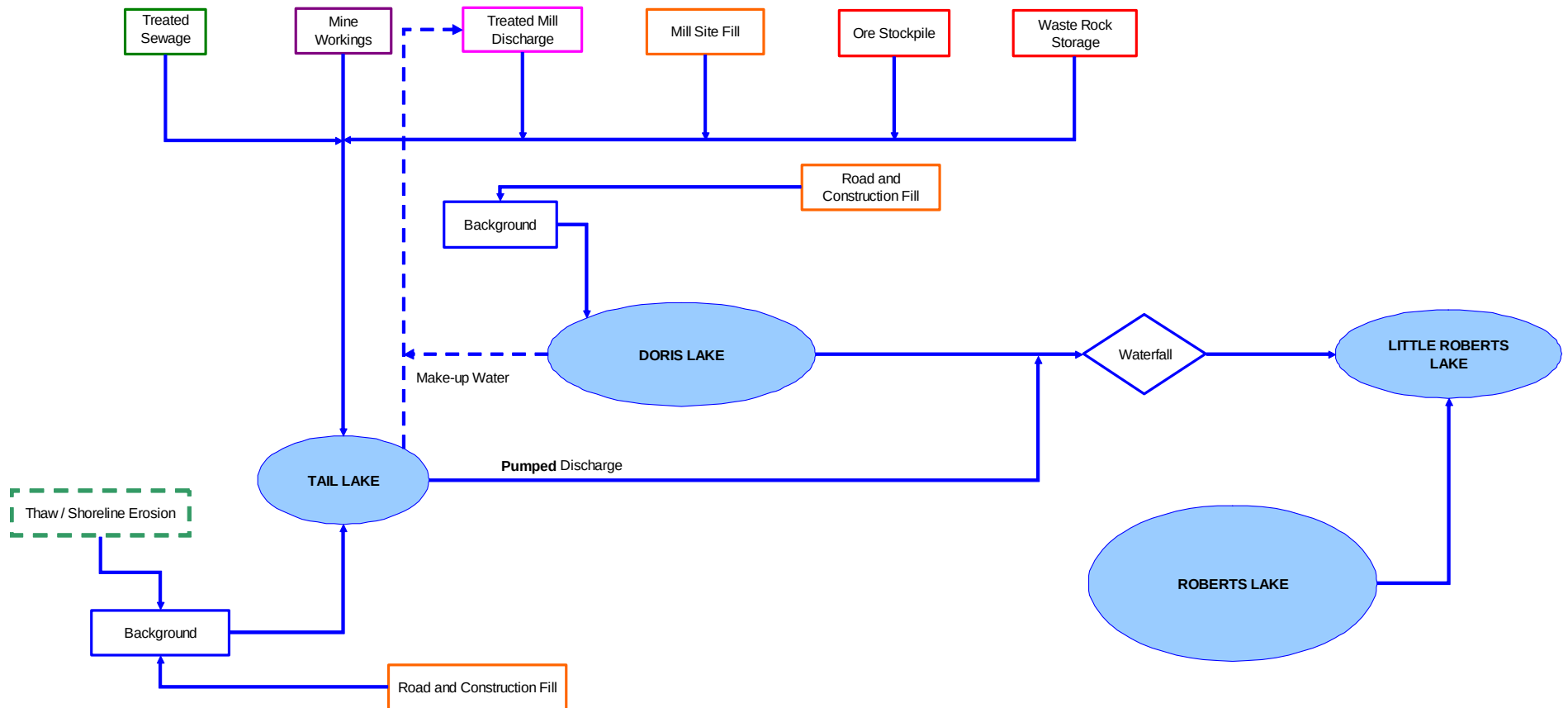


Figure 3.1: Simplified Water and Load Balance

3.2 Model Input Assumptions and Calculations

3.2.1 Hydrology

The water balance inputs reflect the precipitation and runoff estimates that were developed by AMEC (2003b) and MHBL (2005), as discussed in Chapter 2 of this report. The water quality and load balance model has been developed to allow assessment of low, average and high flow conditions.

3.2.2 Background Concentrations

Historical Monitoring Results

The background water quality monitoring results for the site, spanning several years, have been compiled by Golder Associates (MHBL 2005). As will become apparent in later sections, the copper concentration in the outflow from Doris Lake will be an important factor in managing the decant water from Tail Lake. The concentrations of other parameters, including aluminium, chromium and selenium may also constrain the water management strategy for Tail Lake. The following discussion briefly reviews the background water quality monitoring results that have been compiled to 2003. The following is noted:

Copper. The 1997 results for June 19, two replicates for July 19, and that for August 20, were all reported as 2 µg/L, with no decimal value shown (Note: CCME guideline is 2 µg/L). The dissolved copper for June and one July replicate were also reported as 2 µg/L (no decimal) and that for the remaining two results were 1 µg/L (no decimal). These results clearly suggest that the values were rounded (up or down) and that the decimal was not reported, even though the detection limit for these results was 1 µg/L. It is further noted that for the replicate samples taken in September 2000, the first returned a total copper of 1.6 µg/L and the second returned a value of 2.3 µg/L. A similar discrepancy was observed for other parameters in the replicate set, including aluminium, calcium, sodium and potassium, suggesting poor quality control on these samples. Only one sample was analyzed in 2003. Disregarding the results that have been rounded, and disregarding the replicate set that yielded poor reproducibility, 5 data points spanning 7 years are available. The copper concentration in these samples ranged from 1.44 µg/L to 1.6 µg/L, with an average of 1.52 µg/L.

Aluminium. The total aluminium concentration in Tail Lake outflow ranged from 19 µg/L to 150 µg/L, with an average 68 µg/L (Note CCME guideline is 100 µg/L). As noted above, one set of replicates samples resulted in poor reproducibility. It is further noted that the total concentrations on average were five times the dissolved concentrations, indicating that most of the total aluminium is accounted for as suspended solids.

Chromium. The detection limits for chromium ranged from 0.5 µg/L to 1 µg/L. (Note: CCME guideline is 1 µg/L.) In all but two samples, total chromium concentrations were below detection. The average concentration for the two samples above detection was 0.6 µg/L.

Selenium. The detection limits reported for selenium ranged from 0.5 µg/L to 1 µg/L. (Note: the CCME guideline is 1 µg/L.) Selenium was above the detection limit in only one sample, with a concentration of 0.6 µg/L.

It is further noted that the detection limit for cadmium in all cases was well above the CCME guideline for the protection of freshwater aquatic life. Cadmium concentrations were below detection in all but one sample for Doris Lake outflow. Total suspended solids (TSS) ranged from <1 mg/L to 7 mg/L.

Observations similar to those described for Doris Lake in general also apply to Tail Lake outflow and can be summarised as flows:

Copper. Total copper concentrations in Tail Lake outflow in general were lower than in Doris Lake outflow. Rounding of results appears to have occurred over the same period as that described for Tail Lake. Disregarding the rounded results, the total copper concentration ranged from 0.7 µg/L to 1.7 µg/L, with an average of 0.99 µg/L.

Aluminium. The total aluminium concentration in Tail Lake ranged from 14 µg/L to 85 µg/L, with an average of 42 µg/L. Similar to Doris Lake outflow, the aluminium occurred predominantly as particulate matter.

Chromium. The detection limits for chromium ranged from 0.5 to 1 µg/L. (Note: CCME guideline is 1 µg/L). All the samples were below the detection limit.

Selenium. The detection limits reported for selenium ranged from 0.5 to 1 µg/L. Total selenium concentrations were above the detection limit in two samples, with an average of 0.55 µg/L.

As for Doris Lake outflow, the detection limit for cadmium in all cases was well above the CCME guideline for the protection of freshwater aquatic life. Cadmium concentrations were below detection in all samples. Total suspended solids (TSS) typically was below detection (8 of 13 samples) and ranged from <1 mg/L to 5 mg/L, with one anomalous result of 20 mg/L reported for August 22, 1996.

Current Water Quality Monitoring Results

During 2004 an intensive background water quality monitoring program was undertaken, with a total of 11 sampling events. The frequency was almost weekly, except for the period spanning mid August to mid September. The intense sampling program was undertaken to provide an indication of the seasonal variation in water quality. Quality assurance was provided by analysing several replicate and blank samples.

Supplemental monitoring was undertaken in 2005 at a biweekly to three-weekly frequency, from late June to mid September.

The results for the key parameters in Doris Lake outflow were as follows:

Copper. In 2004, the total copper concentrations ranged from 1.06 to 1.53 µg/L, with an average of 1.29 µg/L. Peak concentrations occurred in early July and in September. It should be noted that replicate samples were analysed on July 22 (2), August 15 (2), September 12 (3) and on September 22 (3). Except for the August 15 set, the replicate results provided good reproducibility as follows:

- July 22 1.15 and 1.20 µg/L
- August 15 1.57 and 0.954 µg/L
- September 12 1.45, 1.51 and 1.53 µg/L
- September 22 1.44, 1.43 and 1.44 µg/L

The 2005 monitoring results indicated a copper concentration of 2.06 µg/L for the August 20 sample. However, it is noted that this sample had an elevated total suspended solids concentration of 25 mg/L compared to less than 4 mg/L for the remainder of the samples. This strongly suggests that the sample may have been compromised. The copper concentration in the remainder of the samples ranged from 1.1 to 1.4 µg/L, with an average of 1.29 µg/L. (Inclusive of the result for August 20, the average was 1.4 µg/L). The results indicate that, barring the August 20 sample, the copper concentrations in 2005 were very similar to those observed in 2004.

Aluminium. During 2004, the total aluminium concentrations in Doris Lake outflow ranged from 10 µg/L to about 80 µg/L, with an average of 52 µg/L. Concentrations tended to increase toward the end of summer and into fall. As noted for copper, the 2005 results for August 20 reflected the elevated TSS concentration, with a total aluminium concentration of 774 µg/L. For the remainder of the samples, the results for 2004 indicate an elevated aluminium concentration in spring, with a general decrease in concentrations toward fall. The concentrations ranged from 31 µg/L to 145 µg/L, with an average of 68 µg/L. The results suggest that the average aluminium concentration in 2005 was marginally higher than that observed in 2004.

Chromium. The total chromium concentrations in 2004 ranged from < 0.03 µg/L to 0.64 µg/L, with an average of about 0.24 µg/L. The maximum concentration was reported for June 24. During 2005, a chromium concentration of 1.41 µg/L was reported for the sample with an elevated TDS (August 20). The remainder of the samples ranged from 0.15 to 1.26 µg/L, with an average of 0.43 µg/L. (Inclusive of the result for August 20 the average was 0.59 µg/L). The results suggest that the chromium concentrations in 2005 were higher than in 2004.

Selenium. The total selenium concentration in Doris Lake outflow during 2004 ranged from 0.18 µg/L to 0.90 µg/L, with an average of 0.51 µg/L. During 2005, selenium concentrations ranged from 0.46 µg/L to 1.26 µg/L, with an average of 0.73 µg/L (inclusive of the August 20 sample). It is noted that the maximum concentration in 2005 exceeded the CCME guideline for the protection of freshwater aquatic life. The results suggest that concentrations during 2005 were elevated above those recorded in 2004.

It is further noted that, with the improved detection limit of 0.002 µg/L for cadmium, only one sample was above the detection limit in 2004 (0.003 µg/L, July 22), and two samples were above detection in 2005 (0.002 and 0.005 µg/L on August 5 and 20 respectively). However, the cadmium concentration remained well below the CCME guideline for the protection of freshwater aquatic life. Total suspended solids (TSS) ranged from 3 mg/L to 8 mg/L with an average of 5 mg/L in 2004. In 2005, barring the single sample that had a TSS of 25 mg/L, the TSS ranged from 2 mg/L to 4 mg/L.

The results for Tail Lake outflow can be summarised as follows:

Copper. During 2004, the total copper concentration ranged from 0.66 to 1 µg/L, with an average of 0.78 µg/L. The results reported for 2005 ranged from 0.51 to 0.92 µg/L, with an average of 0.76 µg/L, indicating essentially no change from 2004.

Chromium. The chromium concentration in Tail Lake outflow ranged from 0.09 to 0.86 µg/L during 2004, with an average of 0.36 µg/L. The results reported for 2005 ranged from < 0.03 µg/L to 0.34 µg/L with an average of 0.26 µg/L, indicating lower concentrations during 2005.

Aluminium. The results reported for 2005 indicated aluminium concentrations ranging from 9 to 46 µg/L, with an average of 18 µg/L. The 2005 results were similar, with concentrations ranging from 9.5 to 45 µg/L and returned an average concentration of 16 µg/L.

Selenium. The results for 2004 indicated that the total selenium concentration in Tail Lake outflow ranged from <0.1 µg/L to 0.4 µg/L, with an average of < 0.30 µg/L. Concentrations reported for 2005 ranged from 0.23 µg/L to 0.52 µg/L, with an average of 0.36 µg/L, indicating little change from the 2004 results.

The improved detection limit indicates that cadmium concentrations in Tail Lake outflow is at or below the detection limit of 0.002 µg/L. During 2004 the total suspended solids concentrations were below the detection limit of 3 mg/L, and below the detection limit of 1 mg/L during 2005.

A direct comparison of the current results with historical (i.e. pre 2003) results is not advisable due to changes in analytical methods (mainly resulting in improved detection limits) and uncertainties associated with quality control. Nonetheless, in consideration of these constraints, a comparison with the historical results indicates similar results for the parameters of significance, and that the more current results (in particular the 2004 data set) provide a more reliable database for site water quality.

Selection of Background Water Quality Concentrations

As discussed above, the water quality results for Doris Lake outflow indicated some differences for some parameters between the 2004 and 2005 results. The concentrations of copper in general were very similar, whereas some parameters on average were marginally higher in 2005 than in 2004 (e.g. aluminium, chromium and selenium). However, it should be noted that only 6 sampling events were

undertaken in 2005 as compared to 11 sampling events in 2004, and outlier results for 2005 are more likely to skew the results for that period.

The results for Tail Lake outflow showed little variation between the two monitoring periods.

Because of the high sampling frequency and improved quality assurance and quality control for the 2004 monitoring period, the data-set for 2004 is believed to best represent the potential seasonal fluctuation that may occur throughout the open water period. Therefore, only the results from the 2004 programme are used to represent background water quality in the load balance calculations.

The water and load balance model is based on a monthly time-step. Therefore, the concentration estimates that were adopted from the 2004 data-set equalled the maximum concentration measured within each month. To provide added conservatism to the modelling, the concentration was assumed to remain constant at this maximum value for the entire month. For example, as shown in Figure 3.2, the total copper concentration in Doris Lake outflow (Doris Creek) adopted for the month of July was 1.53 µg/L, the maximum for that month, even though the concentration is observed to decrease later in the month. The figure also shows the results for 2005, and includes the results for August 20. Similar comparisons are provided for aluminium, chromium and selenium in Figures 3.3, 3.4 and 3.5. As shown in the figures, the adopted concentrations in general fairly reflect the actual concentration range measured for copper, aluminium and chromium. The 2005 results for selenium are slightly more scattered. Note however that these plots include the results for the sample taken on August 20, 2005, which may have been compromised.

The resultant background water quality estimates derived from these results, as used in the water quality model, are provided in Appendix B.

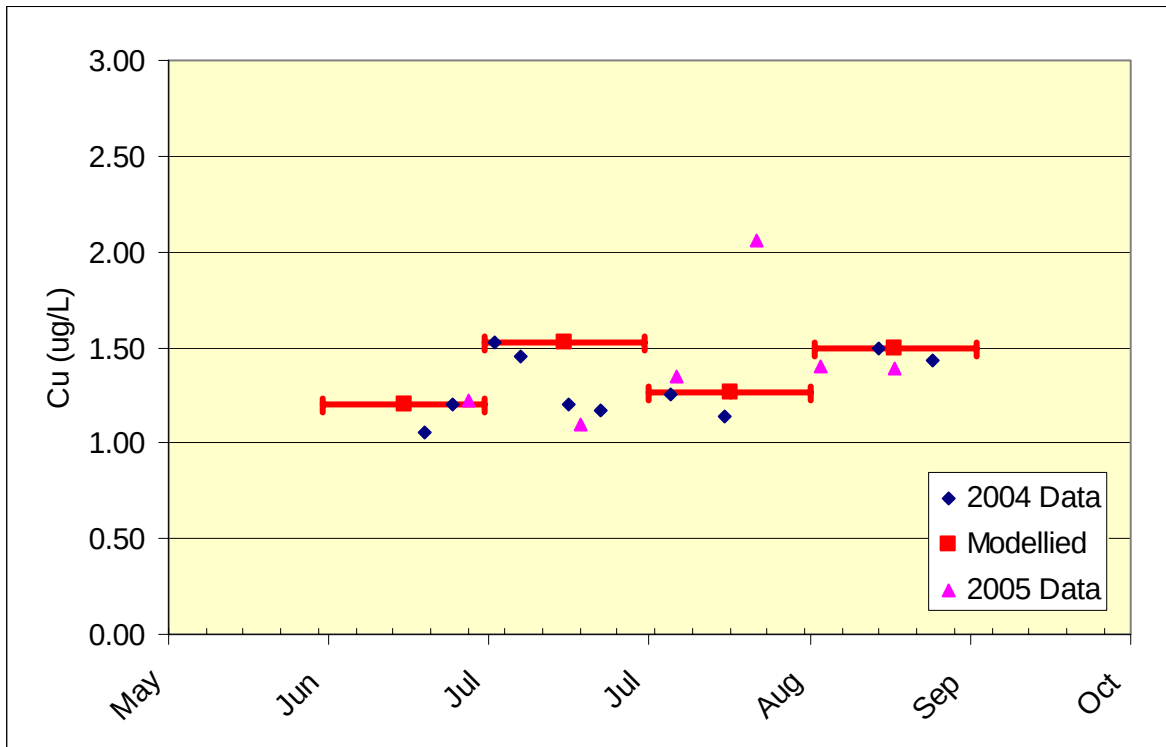


Figure 3.2: Comparison between Actual and Model Inputs for Background Total Copper Concentrations in Doris Creek

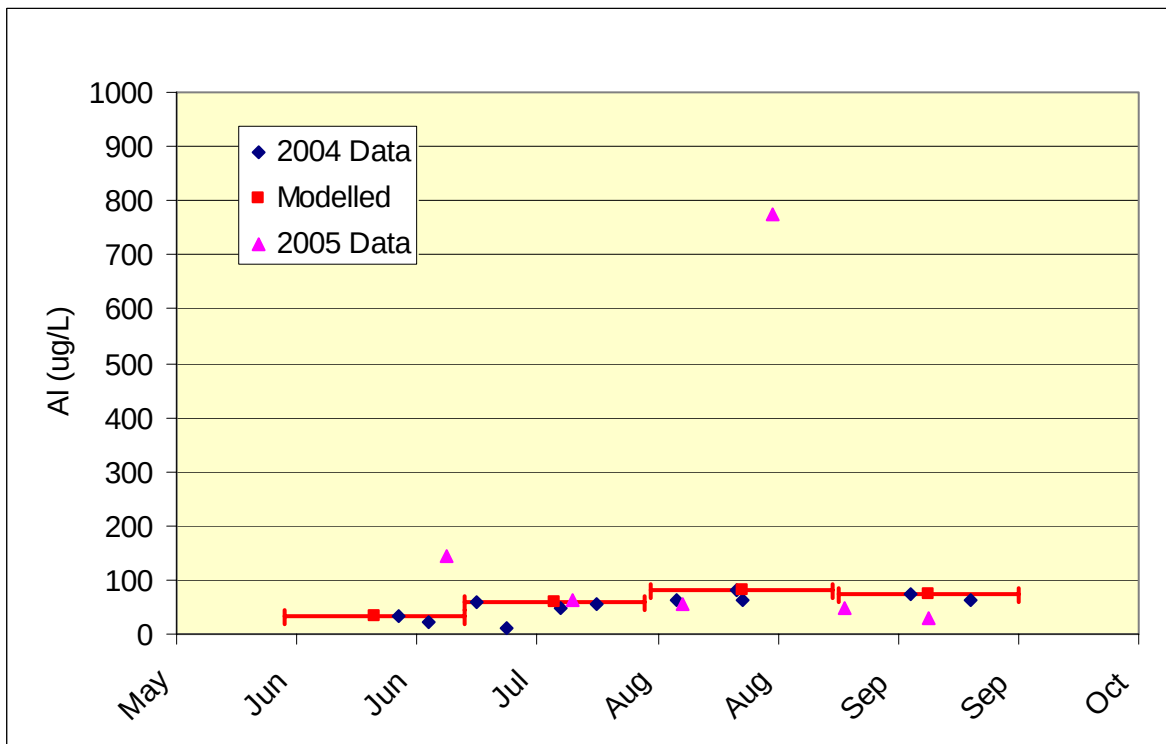


Figure 3.3: Comparison between Actual and Model Inputs for Background Total Aluminium Concentrations in Doris Creek



3.2.3 Nitrogen Release from Blast Residues

In general, the estimates of ammonia-N, nitrate-N and nitrite-N were derived following the methods described in Ferguson and Leask (1988), with the exception of increasing the blast residue factor as described below.

Mine production rates and estimated explosives usage rates provided by MHL indicated a powder factor of about 1.14 kg per tonne of rock mined. This is marginally higher than a typical powder factor for underground drifting of about 0.9 kg per tonne as reported by McIntosh Redpath Engineering (2003).

Ferguson and Leask (1988) suggest that about 1% of the total mass of ANFO used during mining will remain as blast residues within the mined rock, accounting for missed fires, spillage and incomplete detonation. However, for the purpose of this assessment a conservative blast residue content of ten times that recommended by Ferguson and Leask (1988), or about 10%, was adopted for the base case evaluation.

Subsequent to mining, the proportion of blast residues that will be released from the mined rock will depend on a number of factors, including rate of infiltration, water – rock contact ratio and duration of exposure. Therefore, the steps to calculate the release of ammonia and nitrate from the mined rock were as follows:

1. An estimate of the amount of ANFO used in the blasting of each of the waste rock and ore materials was calculated by multiplying the amount of each material by the powder factor.
2. The residual mass of ANFO was then estimated by multiplying the total mass of ANFO used to produce the rock and ore with the overall residue factor (i.e. 10%).
3. The amount of nitrogen in the ANFO was calculated assuming that the ANFO comprises 94% NH_4NO_3 , and 6% fuel oil. The mass weight equivalent of the N in ammonium nitrate is 35%, therefore the total N content of the ANFO is 33%.
4. The amount of nitrogen released from the waste rock in storage was calculated assuming that about 20% of the residual nitrogen will be flushed from the waste rock over a three year period, i.e. about 6.7% of the residual nitrogen would be flushed annually. The release was assumed to occur over a 5 month period, prorated to the site hydrograph. The same approach was adopted to calculate the release from the construction fill.
5. Although the ore will reside on the stockpile for about 2 weeks on average, the ore stockpile is expected to respond similar to the waste rock storage pile, and the calculations described above in Step 4 were applied to the ore stockpile as well.

6. The nitrogen release to the tailings slurry was calculated assuming that all of the remaining blast residues will be flushed from the ore and released to the tailings water due to the high solubility of ammonia and nitrate compounds.
7. A proportion of the waste rock will be directly backfilled to the underground workings. That rock will be less exposed to flushing, since the mine is expected to be dry. Nonetheless, the calculations for waste rock stored on surface were also applied to the waste rock backfill, with the exception that the blast residues would be released year round to mine water.
8. The speciation of the nitrogen in the blast residues was assumed to be 28% ammonia, 70% nitrate, and 2% nitrite. In contrast to the recommendations in Ferguson and Leask (1988), this conservatively assumes a higher portion of the nitrogen will be present as ammonia.

The overall calculation to estimate annual nitrogen release from the fill and waste rock therefore was as follows:

$$N_T = (PF * W_r) * R_f * 0.33 * A_r \quad \dots(3.1)$$

Where: N_T = annual release of total nitrogen (kg/year),
 PF = powder factor (1.14 kg ANFO per tonne of rock),
 W_r = mass of rock produced/placed (tonnes),
 R_f = Residual nitrogen remaining (assumed to be 10%),
 A_r = Fraction released annually (0.067), and
0.33 = Total nitrogen content of blast residues (fraction) .

The total nitrogen was then apportioned to ammonia, nitrate and nitrite as in Step 8. The calculations do not consider any effects from natural nutrient degradation or attenuation within the waste rock and fill.

The estimated weights of construction fill and waste rock that would contribute to nutrient release from blast residues are summarised in Table 3.1. Note that the table makes provision for four cases where fill may be used for shoreline erosion protection at Tail Lake. All these scenarios do not allow for bedrock correction of 40% and are therefore very conservative. The table also include mass estimates for the construction of fish habitat in Doris Lake and in Roberts Bay. Since the quarry rock will be placed fresh and remain fully submerged, only nutrient release is expected from this rock. The estimated nutrient release expected to occur from these activities are presented in Appendix C. The estimated nutrient release that may occur from the construction of the jetty is also included in the appendix.

In addition to the estimates provided in Table 3.1, approximately 244,000 tonne of milled ore would annually contribute blast residue to Tail Lake.

Table 3.1: Summary of Estimated Construction Fill and Waste Rock Production

Infrastructure Component	General Detail	Estimated Quantity		Footprint Surface ¹ Area (m ²)	Distribution		Quantity		Comment
		ECM (m ³)	Dry Tonnes		Doris Lake	Tail Lake	Doris Lake	Tail Lake	
Tank farm at mill (7.5 million litre)	71m x 71m surface area; 1.2:1 side slopes; 0.5m thick; 0.8m high berm	5,200	10,800	5,000	100.00%	0.00%	10,800	-	
Tailings discharge decant road	5.1m wide traffic surface; 1.2:1 side slopes; 2.0m thick; 378m length	5,700	11,900	2,400	100.00%	0.00%	11,900	-	
Tailings discharge pump house pad	20m x 20m surface area; 1.2:1 side slopes; 2.0m thick	700	1,500	400	100.00%	0.00%	1,500	-	
All-weather road (barge site to mill)	6m wide traffic surface; 1.2:1 side slopes; 2.0m thick; 4.8km length	80,700	167,800	51,900	10.42%	0.00%	17,500	-	
All-weather road (tailings service road)	5.1m wide traffic surface; 1.2:1 side slopes; 2.0m thick; 5.9km length	88,500	184,100	59,000	32.20%	67.80%	59,300	124,800	
Caribou crossings (8)	10m long; 5:1 approach slopes; 2.0m thick	2,500	5,200	2,500	37.50%	25.00%	2,000	1,300	
Road turnouts (8) & turnaround (tailings service road)	10m wide; 30m long; 1.2:1 side slopes; 2.0m thick & 10m x 10m turnaround	5,000	10,500	3,100	22.22%	77.78%	2,300	8,200	
Float plane & boat dock service road	6m wide traffic surface; 1.2:1 side slopes; 2.0m thick; 300m length	8,500	17,600	3,300	100.00%	0.00%	17,600	-	
Landfill access road	6m wide traffic surface; 1.2:1 side slopes; 2.0m thick; 150m length	2,600	5,300	1,600	100.00%	0.00%	5,300	-	
Bridge crossing and abutments (2)	10m wide traffic surface; 1.2:1 side slopes; 2.5m thick; 27m length	1,900	3,800	900	100.00%	0.00%	3,800	-	
Mill and camp area	Mill, Crusher, Ore Stockpile, workshop, fuel tank farm, mill reagents storage, laydown area, power supply, camp / dry, mine office, sewage treatment, water treatment plant, waste rock pile pad and berm, waste rock pond.	55,100	114,600	62,600	0.00%	100.00%	-	114,600	Collect and pump to Tail Lake
Float plane & dock	10m x 30m surface area; 1.2:1 side slopes; 3.0m thick	900	1,900	1,000	100.00%	0.00%	1,900	-	
Tailings emergency dump catch basins (4)	25.2m x 25.2m surface area; 2:1 side slopes; 2.0m average base thickness; 1m high berm	5,100	10,600	4,400	25.00%	75.00%	2,700	8,000	
Doris Lake fish habitat	5 areas each with 25m x 25m surface area; 1.5m thickness; and 1 area with 30m x 30m surface area; 1.5m thickness (Golder 2005)	6,000	12,500	4,000	0.00%	0.00%	-	-	Only nutrients release
All surface road maintenance	Allowance for all surface road maintenance @ 5cm new surfacing grade every year for 8 years	36,500	75,900	n/a	24.12%	32.15%	18,300	24,400	
Landfill interim cover	100m x 50m surface area; 1.2:1 side slopes; 0.3m thick added on top of waste every year for 8 years	12,000	25,000	n/a	100.00%	0.00%	25,000	-	
Shoreline erosion (contingency)	20% of 12.9 ha surface area (up to elev. 29.4m); 0.5m thickness (SRK 2005c)	12,900	26,800	25,800	0.00%	100.00%	-	26,800	
Landfill closure	100m x 100m surface area; 1.2:1 side slopes; 1m thick for ultimate cover	10,000	20,800	n/a	100.00%	0.00%	20,800	-	
Subtotal							200,700	308,100	
Shoreline protection contingency									
Base Case	No protection						-	-	
	TOTAL						200,700	308,100	
Case 1	Provide rip-rap on 20 % of the area affected to an elevation of 29.4 m						-	26,800	
	TOTAL						200,700	334,900	
Case 2	Provide rip-rap on 60 % of the area affected to an elevation of 29.4 m						-	80,400	
	TOTAL						200,700	388,500	
Case 3	Provide rip-rap on 100 % of the area affected to an elevation of 29.4 m						-	134,000	
	TOTAL						200,700	442,100	
Case 4	Provide rip-rap on 100 % of the area affected to the Full Supply Level						-	515,700	
	TOTAL						200,700	823,800	

3.2.4 Solute Release from Mine Waste Rock and Ore

A portion of the waste rock that will be produced during the development stages of the underground mine workings will need to be stored on surface until it can be backfilled in the mined out stopes. The backfilling operations will be scheduled so that the waste rock can be backfilled as soon as practical. The estimated mass of waste rock that will be in storage on the storage pad was derived from the mining and backfilling schedule illustrated in Figure 3.6.

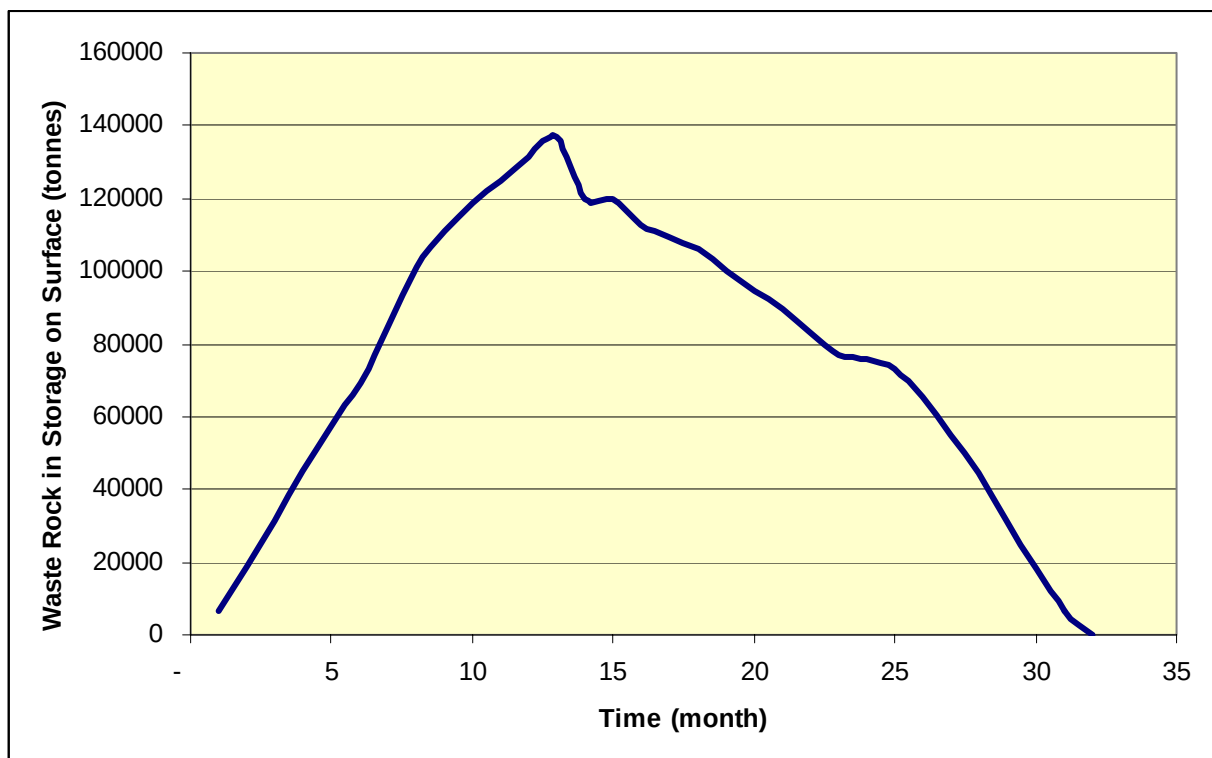


Figure 3.6: Schedule of 'On Surface' Waste Storage

As shown in the figure, the waste rock storage will peak at about 137,000 tonnes at about month 13, and the pad will remain active for a period of about 32 months. In the water and load balance calculations it was conservatively assumed that the maximum waste rock mass in storage (i.e. 137,000 tonnes) will be present from day 1, and will remain in storage for a period of 36 months. This approach is clearly very conservative.

The rates of solute release for the waste rock were extrapolated from the humidity cell test results completed by Rescan Consultants, as reported in the Rescan December 2001 report entitled "Acid Rock Drainage Characterization - Boston and Doris Lake Properties" (Rescan 92001). The tests were completed on four samples described as i) mafic volcanic, ii) gabbro, iii) mafic volcanic with possible veining, and, iv) quartz (>1% pyrite). The samples were obtained from the Doris Lake Property during a diamond drilling program undertaken in 2001. Of the four samples tested, three come from diamond drill holes into the Doris Connector zone under Doris Lake. These three

samples are the gabbro, mafic volcanic with possible veining, and the quartz (> 1% pyrite) samples. The fourth sample tested in the humidity cell is from a shallow sample, the mafic volcanic sample, located at the extreme south of the Doris Hinge Zone.

The samples selected for these humidity cells all fall well above the average total sulphur and sulphide sulphur contents of the waste rock samples tested for acid base account (ABA) (AMEC 2005). The sulphide sulphur concentrations for these four samples were as follows:

- i) Mafic Volcanic 1.68% (wt) total sulphur and 1.68% (wt) sulphide sulphur
- ii) Gabbro 1.85% (wt) total sulphur and 1.85% (wt) sulphide sulphur
- iii) Mafic Volcanic Possible Veining 6.57% (wt) total sulphur and 6.54% (wt) sulphide sulphur
- iv) Quartz 1.87% (wt) total sulphur and 1.87% (wt) sulphide sulphur

As part of the waste rock characterization program, 166 samples were tested for ABA. The total sulphur concentrations for these samples ranged from 0.01% (wt) to 6.57% (wt) with an average of 0.79% (wt). Furthermore, out of the 166 samples only 21 samples had sulphide sulphur concentrations in excess of 1.50% (wt), and comprised ten samples of mafic volcanic, nine samples of quartz, and two samples of gabbro. It is apparent therefore that all four samples used in the humidity cell tests tend to over represent the sulphide mineralization in the waste rock.

The distribution of the rock type that will likely be brought to surface for temporary storage will comprise:

- i) 75.3% Fe tholeiites, consisting primarily of mafic volcanic and mafic volcanic with quartz veining;
- ii) 0.5% Mg tholeiites, consisting primarily of Gabbro and altered wall rock (altered basalts); and,
- iii) 24.2% diabase dike material.

While there are no representative humidity cell test data for the diabase dike material, it is noted that none of this material had a sulphur content in excess of 0.5 %.

The Fe tholeiites are probably best represented by the three humidity cells completed on the mafic volcanic, mafic volcanic with possible veining and the quartz samples. The Mg tholeiites is likely best represented by the humidity cell test completed on the gabbro sample. However, in both cases, the sulphide mineral content is to be over represented.

The investigation showed that the majority of the waste rock would not be net acid generating. For the minor proportion of the waste rock that might be acid generating, the humidity cell tests generally indicated that there would be a lag of many years before acid generating conditions would occur. Therefore, the waste rock would not generate acid within the three year period while stored on surface.

The contaminant release that may occur from the waste rock was calculated as follows:

1. The average solute release rates, in units of mg/kg/week, were calculated from the final cycles of the humidity cell tests for each of the rock types to provide estimates of 'steady state' solute production rates. Where the concentrations of parameters were consistently below the detection limit (reported in Appendix H of the Rescan kinetic testing report, December 2001), solute concentrations were assumed to be at 50 % of the detection limit and were used to estimate solute release rates. An average production rate was then estimated for each solute. For simplicity, the average was obtained for all the rock types on an equal weight basis. Because of the similarity in release rates, and the over representation of sulphide minerals in the samples tested, averaging across the samples on an equal weight basis remains conservative. The results are summarised in Table 3.2. The average rate was then used to calculate overall solute releases from the bulk of the waste rock as described below.
2. The average solute release rates were multiplied by the total mass of waste rock to yield a total generation rate.
3. The humidity cell tests were performed on rock samples crushed to 80% less than 6 mm. The actual fines content (< 6 mm) of the waste rock will be significantly lower, depending on the friability of the rock, and the fraction of fines is expected to range from 0.1 to 0.4mm. Since the specific surface area (surface area per unit mass) increases inversely with particle size, and thus the area of available reactive surfaces, the lower proportion of fines in the waste rock compared to the samples tested will result in reduced rates of solute release. A correction factor of 0.3 was adopted. Therefore, the total solute release rates from Step 2 were multiplied by a factor of 0.3 to correct for surface area exposure.
4. The humidity cell tests were operated under conditions of high and frequent flushing which promotes the release of solutes generated from oxidation. In the humidity cell tests, 1 kg of rock was flushed weekly with 500 mL of water, which equates to an infiltration rate of about 28 mm/week. At the site, infiltration to the waste rock is expected to occur only 4 to 5 months per year. The infiltration to the waste rock is expected to be less than 50% of the mean annual precipitation, or about 104 mm per year, which equates to be 5 to 6 mm/week. The lower infiltration rate in the field is expected to lead to the formation of selective flowpaths and thus, compared to the humidity cell tests, a lower proportion of the waste rock will be contacted by infiltrating water which will further limit solute release. Experience elsewhere indicated that only about 10% to 40% of the soluble loads that are generated are released to seepage. For the purpose of this calculation, conservatively a factor of 40% was adopted.
5. The annual solute release was prorated on a monthly basis over the summer months according to the site runoff hydrograph.

In summary, the overall calculation to determine the average monthly load was as follows:

$$M_i = L_{HC)i} * W_R * 20 * 0.3 * 0.4 / 1000 \quad \dots(3.2)$$

Where M_i = loading of solute i in kg/year,
 $L_{HC)i}$ = solute i production rate in the humidity cell (mg/kg/wk),
 W_R = tonnes of waste rock in storage,
0.4 and 0.3 are correction factors as discussed above in points 3 and 4,
20 is the assumed number of weeks per year (5 months) for which the waste rock is not frozen, and
1000 is a unit conversion factor to obtain kg.

The same calculations were applied to the ore stockpile even though the ore is expected to remain on the stockpile for a very short period only.

In general, the samples tested in the humidity cells showed little solute release during the initial flush, and concentrations in the leachate remained low and generally below detection throughout testing. It is important to note in particular:

- Chromium concentrations were below the detection limit of 0.005 mg/L (five times the CCME guideline) and although 50 % of the detection limit was adopted in the calculations this still represents 2.5 times the CCME guideline, and chromium loadings are likely to be overestimated.
- Selenium concentrations were below the detection limit of 0.01 mg/L (ten times the CCME guideline) and again although 50 % of the detection limit was adopted in the calculation (five times the CCME guideline) it is considered that the selenium loadings are likely overestimated in the calculations.

Table 3.2: Summary of Average Solute Release Rates from Waste Rock Samples Tested in the Humidity Cells

Parameter	Units	Description				Overall Average
		Mafic Volcanic	Gabbro	Mafic with Veining	Quartz	
Sulphate	mg/kg/week	1.55	6.43	5.68	79	23
Total Metals						
Aluminium - Al	mg/kg/week	0.026	0.010	0.0093	0.0043	0.013
Antimony - Sb	mg/kg/week	0.022	0.020	0.023	0.022	0.022
Arsenic - As	mg/kg/week	0.00044	0.00040	0.00046	0.00065	0.00049
Barium - Ba	mg/kg/week	0.0011	0.0010	0.0012	0.0011	0.0011
Beryllium - Be	mg/kg/week	0.00055	0.00050	0.00058	0.00054	0.00054
Bismuth - Bi	mg/kg/week	0.022	0.020	0.023	0.022	0.022
Boron - B	mg/kg/week	0.011	0.010	0.012	0.011	0.011
Cadmium - Cd	mg/kg/week	2.2×10^{-7}	2.0×10^{-7}	2.3×10^{-7}	2.2×10^{-7}	2.2×10^{-7}
Calcium - Ca	mg/kg/week	3.9	4.8	5.8	4.5	4.7
Chromium - Cr	mg/kg/week	0.0011	0.0010	0.0012	0.0011	0.0011
Cobalt - Co	mg/kg/week	0.0011	0.0010	0.0012	0.0011	0.0011
Copper - Cu	mg/kg/week	0.00044	0.00040	0.00046	0.00043	0.00043
Iron - Fe	mg/kg/week	0.0033	0.0030	0.0035	0.0032	0.0033
Lead - Pb	mg/kg/week	0.00022	0.00020	0.00023	0.00022	0.00022
Lithium - Li	mg/kg/week	0.0011	0.0010	0.0012	0.0011	0.0011
Magnesium - Mg	mg/kg/week	2.2	2.5	2.4	1.6	2.2
Manganese - Mn	mg/kg/week	0.0015	0.0051	0.0040	0.0008	0.0029
Mercury - Hg	mg/kg/week	4.4×10^{-7}	4.0×10^{-7}	4.6×10^{-7}	4.3×10^{-7}	4.3×10^{-7}
Molybdenum - Mo	mg/kg/week	0.00022	0.00020	0.00023	0.00022	0.00022
Nickel - Ni	mg/kg/week	0.0022	0.0020	0.0023	0.0022	0.0022
Phosphorus - P	mg/kg/week	0.033	0.030	0.035	0.032	0.033
Potassium - K	mg/kg/week	0.22	1.15	0.23	0.22	0.45
Selenium - Se	mg/kg/week	2.2×10^{-6}	2.0×10^{-6}	2.3×10^{-6}	2.2×10^{-6}	2.2×10^{-6}
Silicon - Si	mg/kg/week	0.17	0.25	0.14	0.14	0.18
Silver - Ag	mg/kg/week	4.4×10^{-5}	4.0×10^{-5}	4.6×10^{-5}	4.3×10^{-5}	4.3×10^{-5}
Sodium - Na	mg/kg/week	0.22	0.20	0.23	0.22	0.22
Strontium - Sr	mg/kg/week	0.002	0.0122	0.005	0.004	0.006
Thallium - Tl	mg/kg/week	4.4×10^{-7}	4.0×10^{-7}	4.6×10^{-7}	4.3×10^{-7}	4.3×10^{-7}
Tin - Sn	mg/kg/week	0.0033	0.0030	0.0035	0.0032	0.0033
Titanium - Ti	mg/kg/week	0.0011	0.0010	0.0012	0.0011	0.0011
Vanadium - V	mg/kg/week	0.0033	0.0030	0.0035	0.0032	0.0033
Zinc - Zn	mg/kg/week	0.0022	0.0026	0.0028	0.0073	0.0037

3.2.5 Solute Release from Quarried Rock

Sources of quarried rock that were tested by AMEC (AMEC 2003c) included the Doris North mine portal adit, rock from the proposed new barge loading area, the quarry west of the proposed camp and the current barge loading area. Although mine development rock will not be used as construction fill, acid base account test results completed on samples from these sources indicated that the quarry rock will be non acid forming and that the sulphide content of the proposed fill rock is very low ($< 0.04\%$).

Three humidity cell tests were completed on quarry rock samples, designated as Quarry #Q1, #Q2 and #Q4 (AMEC 2005). Using the results from the humidity cell tests, solute release calculations were completed as described above for the waste rock samples. Briefly, the average solute release rates, in units of mg/kg/week, were calculated from the final 'steady state' cycles of the humidity cell tests. Where the concentrations of parameters were consistently below the detection limit, solute concentrations were assumed to be at 50 % of the detection limit and were used to estimate solute release rates. An average production rate was then estimated for each solute by obtaining an equal weight average for the three samples. The results are summarised in Table 3.3. The average rate was then used to calculate overall solute releases from the bulk of the construction rock as described below. The average solute release rates were multiplied by the total mass of waste rock, as shown in Table 3.1, to yield a total generation rate within each of the designated catchments.

The release rates were multiplied by the number of weeks for which the rock will not be frozen to estimate the overall annual solute generation. As before, to estimate the net release, a surface area correction factor of 0.3 and a release factor of 40% were adopted. The annual loading was then prorated on a monthly basis according to the site hydrograph.

In summary, the overall calculation to determine the average monthly load was as follows:

$$M_i = L_{HC)i} * W_R * 20 * 0.3 * 0.4 / 1000 \quad \dots(3.3)$$

Where M_i = loading of solute i in kg/year,
 $L_{HC)i}$ = solute i production rate in the humidity cell (mg/kg/wk),
 W_R = tonnes of waste rock in storage,
0.4 and 0.3 are correction factors as discussed above in points 3 and 4,
20 is the assumed number of weeks (5 months per year) for which the construction rock is not frozen, and
1000 is a unit conversion factor to obtain kg.

It should be noted that the entire loading generated by the fill is modelled to contribute to contaminant concentrations from time of placement, and it is assumed that transport of the leachate to each of Doris Lake and Tail Lake occurs instantaneously. In many cases this will lead to conservative estimates of solute concentrations in each of the lakes because the actual transport of solutes to the lakes will depend on the:

- Distance from the lake that the fill is placed; and
- Potential sorption reactions that may occur as water flows over and through the tundra soil that will remove and attenuate solutes, thus increasing the time before the solutes will enter the respective lakes.

Furthermore, it was assumed that all of the site fill will generate solutes. In reality, a significant proportion of the fill will be covered by buildings and concrete pads and the actual loadings will be proportionately lower. The approach therefore is conservative.

Table 3.3: Summary of Average Solute Release Rates from Waste Rock Sample Humidity Cell Testing

Parameter	Units	Sample Description			Overall Average
		Quarry # Q1	Quarry # Q2	Quarry # Q4	
Sulphate	mg/kg/week	0.82	0.86	0.89	0.85666667
Total Metals					
Aluminium - Al	mg/kg/week	0.026	0.024	0.025	0.025
Antimony - Sb	mg/kg/week	0.00012	0.00012	0.00012	0.00012
Arsenic - As	mg/kg/week	0.00099	0.00062	0.00012	0.00058
Barium - Ba	mg/kg/week	0.000060	0.000055	0.000115	0.000077
Beryllium - Be	mg/kg/week	0.00012	0.00012	0.00012	0.00012
Bismuth - Bi	mg/kg/week	0.00012	0.00012	0.00012	0.00012
Boron - B	mg/kg/week	0.0060	0.0055	0.0060	0.0058
Cadmium - Cd	mg/kg/week	0.000029	0.000032	0.000026	0.000029
Calcium - Ca	mg/kg/week	1.5	1.5	1.4	1.5
Chromium - Cr	mg/kg/week	0.00012	0.00012	0.00012	0.00012
Cobalt - Co	mg/kg/week	0.00012	0.00012	0.00012	0.00012
Copper - Cu	mg/kg/week	0.00023	0.00012	0.00012	0.00015
Iron - Fe	mg/kg/week	0.0060	0.0055	0.0060	0.0058
Lead - Pb	mg/kg/week	0.00012	0.00012	0.00012	0.00012
Lithium - Li	mg/kg/week	0.00012	0.00012	0.00012	0.00012
Magnesium - Mg	mg/kg/week	0.14	0.25	0.05	0.15
Manganese - Mn	mg/kg/week	0.00018	0.00012	0.00012	0.00014
Mercury - Hg	mg/kg/week	0.0000024	0.0000023	0.0000023	0.0000023
Molybdenum - Mo	mg/kg/week	0.000000060	0.000000055	0.000000060	0.000000058
Nickel - Ni	mg/kg/week	0.00015	0.00012	0.00012	0.00013
Phosphorus - P	mg/kg/week	0.018	0.017	0.018	0.017
Potassium - K	mg/kg/week	0.053	0.029	0.029	0.037
Selenium - Se	mg/kg/week	0.00012	0.00012	0.00012	0.00012
Silicon - Si	mg/kg/week	0.30	0.29	0.24	0.28
Silver - Ag	mg/kg/week	0.000030	0.000029	0.000058	0.000039
Sodium - Na	mg/kg/week	0.052	0.036	0.02	0.036
Strontium - Sr	mg/kg/week	0.00094	0.00086	0.00053	0.00078
Thallium - Tl	mg/kg/week	0.000012	0.000012	0.000012	0.000012
Tin - Sn	mg/kg/week	0.00012	0.00012	0.00012	0.00012
Titanium - Ti	mg/kg/week	0.00012	0.00012	0.00012	0.00012
Vanadium - V	mg/kg/week	0.00047	0.00012	0.00012	0.00023
Zinc - Zn	mg/kg/week	0.00060	0.00055	0.00060	0.00058

3.2.6 Sewage Effluent

Water quality performance estimates were obtained from a manufacturer of package sewage treatment plants (Information provided by PJ Equipment Sales Corp). Expected average solute concentrations and annual loadings for a 175 person camp are summarised in Table 3.4. It was assumed that these loadings would report to Tail Lake continuously throughout the mill operational period, and for one year thereafter.

It should be noted that the phosphorus speciation is not known. In an attempt to quantify orthophosphate concentrations, the phosphorus for this source was input to the model as both total

phosphate and orthophosphate. In reality, the orthophosphate estimates provided in the mode run outputs should be treated as total phosphate rather than orthophosphate.

Table 3.4: Summary of Estimated Treated Sewage Water Quality and Loadings

Parameter	Average Concentration (mg/L)	Average Loading (kg/year)
Total Ammonia	10	250
Nitrate	1.0	25
Nitrite	30	751
Aluminium	0.052	1.3
Arsenic	0.0002	0.004
Cadmium	0.0001	0.0013
Chromium	0.0025	0.063
Copper	0.0020	0.050
Iron	0.025	0.63
Lead	0.0001	0.0013
Molybdenum	0.0001	0.0013
Nickel	0.0005	0.013
Phosphorus	1.0	25
Uranium	0.0002	0.005
Zinc	0.002	0.05

3.2.7 Process Tailings

Mineral processing of the gold bearing ore will comprise free gold recovery by gravity separation, followed by concentration of the sulphide minerals by conventional flotation technology. The flotation concentrate will then be cyanide leached for gold recovery. The cyanide leached tailings will be detoxified to reduce total and free cyanide concentrations, using Caro's Acid. Cyanide and its metal complexes are oxidized to cyanate (CNO^-) in this process. The detoxified cyanide leach effluent would be combined with the flotation tailings and pumped to Tail Lake.

Bench scale pilot testing of the proposed process was carried out by AMMTEC as reported by AMEC (MHBL 2005). Results from the testing program are summarised in Table 3.5. The summary table shows two sets of results; the first was reported by AMMTEC who completed the testing, and the second set represents a repeat analysis by Vizon Scientific (formerly B.C. Research Laboratories (BCR)) at lower detection limits. The increase in the cyanate concentration corresponded well with the theoretical stoichiometry expected for the oxidation of the total cyanide in solution. However, it is noted that some hydrolysis to ammonia, and ammonia oxidation to nitrite, had also occurred during the treatment steps. These nutrient degradation reactions are discussed further in Section 3.4.

The detoxified leach slurry was combined with the flotation tailings in the laboratory tests at the ratio expected during operations. The analytical results for the blended effluent stream are summarised in Table 3.6. The 'freshly' blended effluent was analysed immediately after it was produced, and again after it was aged for 1 month. Complete results are provided in Appendix D.

The laboratory tests were not conducted as 'locked cycle' tests (i.e. the effluent was not recycled until steady state concentrations were achieved), and therefore, the net increase in solute concentrations in the effluent represents the net solute loading that would be expected from the tailings.

Table 3.5: Cyanide Leach and Cyanide Detoxified Solution Assays

Parameter	Units	Cyanide Leach Solution		Cyanide Detoxified Solution	
		AMMTEC	BCR*	AMMTEC	BCR*
pH	-	10.63	10.17	7.86	7.70
Free CN	mg/L	120	153	<5	0.009
Total CN	mg/L	210	220	2.5	1.82
WAD CN	mg/L	180	153	0.25	0.18
CNO	mg/L	360	312	400	282
SCN	mg/L	37	38	0.2	0.82
Ammonia-N	mg/L	3.0	2.2	17	22
Nitrate-N	mg/L	-	1.3	-	2.5
Nitrite-N	mg/L	-	0.052	-	0.39

Notes: Repeat analysis by B.C. Research Laboratories

These concentrations were therefore used to estimate the solute release per unit mass tailings produced, as follows:

$$L_i = (C_i / 1000) * (100 / SG - 1) \quad \dots(3.4)$$

Where L_i = release of solute i in kg/tonne tailings,
 C_i = concentration of solute i , and
 SG = % (wt) solids content of the tailings slurry.

Conservatively, only the maximum total concentration of each solute from the two blended effluent analyses was used in the above calculation. In general, solute concentrations in the aged samples were below the maximum concentration in the blended effluent analyses, with the exception of ammonia, sulphate and iron. The ammonia however is derived from the degradation of cyanate, which is significantly higher in the blended effluent samples, and is accounted for in the degradation reactions described later on. Sulphate concentrations were slightly higher in the aged samples and could have resulted from ongoing oxidation reactions, depending on how the samples were stored, which, as discussed below, are not expected to occur once the tailings have been deposited in Tail Lake. The iron analysis in both the BCR samples was below detection whereas iron was detected in the AMMTEC analyses. However, considering the pH of the effluent, the results reported by AMMTEC appear to be anomalous since iron would be expected to be precipitated from solution to very low concentrations. Nonetheless, the iron concentration reported by AMMTEC for the blended effluent was used in the calculations.

Where both the AMMTEC and the BCR reported values were below detection, the concentration was assumed to be equal to the lower of the two detection limits.

Table 3.6: Summary of Blended and Aged Mill Effluent

Parameter	Units	Blended Effluent		Aged Blended Effluent	
		AMMTEC	BCR*	AMMTEC	BCR*
pH	-	8.18	7.63	7.95	7.87
Free CN	mg/L	<5	0.03	<5	0.01
Total CN	mg/L	0.29	0.24	0.20	0.15
WAD CN	mg/L	0.04	0.036	0.01	0.014
CNO	mg/L	32	33	9.1	8.3
SCN	mg/L	<0.1	0.45	0.3	<0.2
Sulphate	mg/L	349	355	438	446
Ammonia-N	mg/L	1.0	1.1	4.4	5.3
Nitrate	mg/L	2.0	0.74	0.80	0.33
Nitrite	mg/L	1.0	0.12	0.90	<0.002
Alkalinity	mg/L	170	189	150	161
Total Metals					
Aluminium Al	mg/L	0.10	0.01	0.073	0.015
Antimony Sb	mg/L	-	0.003	-	0.003
Arsenic As	mg/L	0.008	0.01	0.002	0.007
Barium Ba	mg/L	0.04	0.041	0.04	0.032
Beryllium Be	mg/L	-	< 0.001	-	< 0.001
Bismuth Bi	mg/L	-	< 0.001	-	< 0.001
Boron B	mg/L	0.05	0.06	0.34	0.08
Cadmium Cd	mg/L	<0.005	< 0.0002	<0.005	< 0.0002
Calcium Ca	mg/L	106	93.5	68.5	65.3
Chromium Cr	mg/L	0.026	0.021	0.020	0.004
Cobalt Co	mg/L	0.040	0.044	0.032	0.04
Copper Cu	mg/L	0.039	0.039	0.024	0.02
Iron Fe	mg/L	0.120	< 0.05	0.220	< 0.05
Lead Pb	mg/L	<0.05	< 0.001	<0.05	< 0.001
Lithium Li	mg/L	-	0.011	-	0.009
Magnesium Mg	mg/L	22.8	26.2	28.2	28.8
Manganese Mn	mg/L	0.12	0.11	0.10	0.084
Mercury Hg	mg/L	<0.0005	< 0.00002	<0.0005	0.00007
Molybdenum Mo	mg/L	0.04	0.031	0.04	0.036
Nickel Ni	mg/L	0.03	0.031	0.01	0.007
Phosphorus P	mg/L	-	0.28	-	0.13
Potassium K	mg/L	182	182	168	175
Selenium Se	mg/L	-	< 0.001	-	< 0.001
Silicon SiO2	mg/L	-	14.9	-	8.27
Silver Ag	mg/L	-	< 0.0001	-	0.001
Sodium Na	mg/L	160	173	162	165
Strontium Sr	mg/L	-	0.33	-	0.28
Thallium Tl	mg/L	-	< 0.0001	-	< 0.0001
Tin Sn	mg/L	-	< 0.001	-	< 0.001
Titanium Ti	mg/L	-	0.001	-	< 0.001
Vanadium V	mg/L	0.005	< 0.001	<0.005	< 0.001
Zinc Zn	mg/L	0.090	0.009	0.092	0.007

Notes: * Repeat analysis by B.C. Research Laboratories

The unit release rate was then multiplied by the monthly rate of tailings production to provide a total monthly loading as follows:

$$M_i = L_i * TP \quad \dots(3.5)$$

Where M_i = loading of solute i in kg/month, and
 TP = monthly tailings production in tonnes.

This ‘conservation of mass’ approach is conservative since some contaminants could reach concentrations at equilibrium with secondary mineral phases after which the concentration could stabilize or even decrease. The estimated loadings were assumed to remain constant throughout operations.

Once extracted from the underground workings, the ore is exposed to atmospheric conditions and the sulphide minerals are exposed to oxidizing conditions. The estimate solute release from the tailings, as described above, represent oxidation reactions that occur during the handling and processing of the ore. In addition, any readily available water soluble solutes associated with the ore rock will also be dissolved during processing and report to the tailings water.

Subsequent to deposition the tailings will at all times be covered by a water depth in excess of 4 m. The water cover will prevent any oxygen entry to the tailings and therefore, the sulphide minerals contained in the tailings will be prevented from oxidizing. Consequently no additional solute release from the tailings will occur after the tailings have been deposited in Tail Lake. It should further be noted that since the tailings will be fully submerged and water will be decanted from the surface of the lake, no hydraulic gradients will develop that could cause the pore water to be displaced from the tailings. It is therefore expected that the tailings porewater will be ‘locked’ interstitially in the tailings indefinitely.

The water and load balance calculations consequently do not consider any additional solute release from the tailings once they have been deposited in Tail Lake.

3.2.8 Sources of Salinity

Drilling Fluids

Drilling fluids were assumed to be present in all mine and quarry products, i.e. construction fill, waste rock and ore.

For the mine water recovered from the underground workings, it was assumed that:

- On average a circulating flow of 191 litres per minute (40 gpm) of saline solution, containing 18% (by weight) calcium chloride, will be maintained during underground mining;
- About 5% of the solution would be lost and report to mine water, which would be pumped directly to Tail Lake.

In addition, saline fluid losses to the construction fill, ore and waste rock are expected to occur. To estimate these loadings, it was assumed that:

- Saline drilling fluids will contribute a 3% increase in moisture content of the mined construction fill, waste rock and ore.

The total saline fluid content of the rock and fill was determined from the weight distributions given in Table 3.1. Salinity releases were calculated assuming 40% of the waste rock or fill would be flushed annually. The annual loadings were prorated to monthly release rates based on the Doris Lake outflow hydrograph.

Porewater Release from Permafrost Thaw

Salinity released due to thawing of permafrost surrounding Tail Lake was included in the load balance calculations. It is anticipated that the permafrost thaw will occur as the water level in Tail Lake rises. Because of the outward hydraulic gradients that will be generated by the rising water level in the lake, little porewater release to the lake water will occur during the time that the water level continues to rise. However, as soon as the water level is lowered to the final water elevation, hydraulic gradients will be reversed toward the lake, and there will be a release of porewater from the thawed areas. The volume of porewater that could be released from the thawed areas was estimated as follows.

A shoreline survey indicated that approximately 5,100 m of Tail Lake shore may contain permafrost that could be thawed by a rise in the water elevation. Thermal modeling suggests that the permafrost could be thawed to a depth of about 3 m, over a shore width of about 50 m. Assuming an average slope of about 6% for the shore, an initial moisture content of 50% and a drained field moisture content of 35% of the soils, it can be shown that a volume of about 57,000 m³ of saline water could be released. It was assumed that the permafrost thaw water would approximate seawater quality, i.e. it would contain about 17.1 g/L chloride, 1 g/L sulphate, 9.3 g/L sodium and about 1.7 g/L calcium.

Conservatively, it was assumed that the entire volume of thawed porewater that could be released would be released to Tail Lake within a period of one year, following the lowering of the water level in Tail Lake to its final spill elevation, or when the rise in water level is reversed.

Porewater Release from Permafrost Soil Erosion

Subsequent to lowering the water level in Tail Lake, erosion of the thawed soils may continue to contribute salinity to Tail Lake. As discussed in the next section, ongoing salinity release from this source is calculated inclusive of the sediment release calculations.

3.2.9 Shoreline Erosion

As a result of the expected rise in water level in Tail Lake during tailings deposition, permafrost soils around the perimeter of Tail Lake are expected to thaw. The thawed soils may become susceptible to re-suspension due to wave action while submerged.

After tailings deposition ceases, as part of the water management strategy, the water level in Tail Lake will be lowered to its original elevation. At that time, the soils above the waterline that have been thawed will be subject to physical erosion caused by overland runoff and wave action impacting on the shoreline. This erosion may lead to sloughing and slumping of thawed soils at steep gradients which may further exacerbate particulate transport to Tail Lake.

The combined effects of physical erosion and re-suspension by wave action may increase the suspended solids concentration in Tail Lake. Calculations have been completed that estimated potential total sediment loadings from three possible erosion mechanisms as follows:

- *Re-suspension of tailings by wave action.* The calculations considered the depth of the water cover; the tailings solids size distribution and the prevailing wind fetch and speed (SRK 2005a).
- *Physical shoreline erosion from overland runoff and wave action.* Calculations completed to estimate the potential sediment transport due to shoreline erosion processes considered only the mass transport that occurs as a result of the physical process of erosion (Appendix E).
- *Shoreline material re-suspension by wave action.* These calculations address soil that had been eroded from the shoreline and has accumulated on the bed of Tail Lake and the shallow fringes near the lake shore (Appendix F).

Due to the depth of the water cover that will exist over the tailings, the effect of wave action on re-suspension of tailings will be negligible (SRK 2005a).

The estimated potential sediment loadings to Tail Lake generated from shoreline erosion and through re-suspension, before any correction for particles settling from the water column, derived from these calculations are summarized in Table 3.7.

Table 3.7: Summary of Estimated Solids Loadings to Tail Lake at 28.3 m

Case	Loading by Physical Shoreline Erosion (kg/year)	Loading Resulting from Re-Suspension of Eroded Material (kg/year)	Estimated Total Annual Loading (kg/year)
Base Case	2,846,891	206,066	3,052,957
Upper Limit	7,354,467	281,115	7,635,582
Lower Limit	948,964	122,261	1,071,225

Settling tests were carried out to assess the residual total suspended solids concentration that may result from these sediment loadings. The test procedures and results for the settling tests are provided in Appendix G. As part of that investigation, the properties of the suspended solids as well as total solute release from the sediments were assessed. The results can briefly be summarized as follows:

- While X-ray diffraction testing indicated the presence of pyrite in the sediments, analytical results indicate that the actual sulphide mineral content is very low, and, that the sediments are not net acid generating.

- Illite and mica are the dominant clay minerals present in the sediments.
- Irrespective of the initial clay content (with particle sizes ranging from 15 % to 40 % less than 2 μm), the settling tests indicated that the solids settled from the water column fairly rapidly, with total suspended solids decreasing to below a detection limit of 1 mg/L within a 72 hour period.

The settling tests were conducted to reflect the estimated potential upper limit sediment loadings (see Table 3.7) to Tail Lake, corrected for low flow conditions (yield of 111 mm/year) at steady state (i.e. the worst case conditions). The results from the settling tests were therefore corrected to reflect both low (111 mm/year) and high (180 mm/year) yield conditions, and for the estimated base case and lower limit conditions. The correction method is discussed in Appendix G. The resulting estimated suspended solids and total solute concentrations that may result from the erosion effects are summarized in Table 3.8 and represent incremental loadings to Tail Lake in the absence of erosion control measures.

It is however important to note the following:

- These concentrations could occur only if: i) sediment loadings reach the estimated maximum rates, and, ii) they persist at those rates indefinitely. In the absence of any physical interventions, effects such as natural revegetation and re-establishment of permafrost are likely to reduce overall sediment loadings in time.
- The solute loading estimates include salinity release (elevated chloride, sodium and potassium concentrations), which somewhat double accounts for the salinity release calculations described previously.

Table 3.8: Estimated Steady State Total Solute Concentrations in Tail Lake

Description	Units	CCME	Test Average	Low Yield (111 mm/year)			High Yield (180 mm/year)		
Flow	m³/year		-	500,000			812,000		
Case			-	Lower Limit	Base case	Upper Limit	Lower Limit	Base case	Upper Limit
Total Sediment Load	g/L		14.5	2.14	6.11	15.27	1.32	3.76	9.40
TSS (measured)	mg/L		1.0	0.1	0.4	1.1	0.1	0.3	0.6
TSS (calc.)	mg/L		7.2	1.1	3.0	7.6	0.7	1.9	4.7
Chloride	mg/L		195	29	82	205	18	50	126
Total Metals									
Aluminium Al	µg/L	100	623	92	262	656	57	162	404
Antimony Sb	µg/L		0.17	0.025	0.070	0.176	0.015	0.043	0.108
Arsenic As	µg/L	5	1.0	0.15	0.44	1.1	0.09	0.27	0.67
Bismuth Bi	µg/L		0.025	0.004	0.011	0.026	0.002	0.006	0.016
Boron B	µg/L		78	11	33	82	7	20	50
Cadmium Cd	µg/L	0.038	0.025	0.004	0.011	0.026	0.002	0.006	0.016
Calcium Ca	µg/L		5,906	8,73	2,488	6,223	538	1,532	3,832
Chromium Cr	µg/L	1	1.2	0.18	0.52	1.29	0.11	0.32	0.80
Cobalt Co	µg/L		0.31	0.046	0.13	0.33	0.028	0.080	0.20
Copper Cu	µg/L	2	1.97	0.29	0.83	2.0	0.18	0.51	1.3
Iron Fe	µg/L	300	605	89	255	638	55	157	393
Lead Pb	µg/L	2	0.12	0.017	0.049	0.12	0.011	0.030	0.076
Lithium Li	µg/L		5.7	0.85	2.4	6.0	0.52	1.5	3.7
Magnesium Mg	µg/L		8,264	1,222	3,481	8,707	752	2,144	5,361
Manganese Mn	µg/L		14	2.1	6.1	15	1.3	3.7	9.4
Mercury Hg	µg/L	0.1	0.050	0.007	0.021	0.053	0.005	0.013	0.032
Molybdenum Mo	µg/L	73	0.80	0.12	0.34	0.84	0.073	0.21	0.52
Nickel Ni	µg/L	25	0.63	0.094	0.27	0.67	0.058	0.16	0.41
Phosphorus P	µg/L		47	7	20	49	4	12	30
Potassium K	µg/L		6,485	959	2,732	6,833	590	1,682	4,208
Selenium Se	µg/L	1	2.5	0.37	1.0	2.6	0.23	0.66	1.6
Silicon Si	µg/L		1,518	224	640	1,600	138	394	985
Silver Ag	µg/L		0.025	0.004	0.011	0.026	0.002	0.006	0.016
Sodium Na	µg/L		115,565	17,083	48,685	121,764	10,519	29,979	74,978
Strontium Sr	µg/L		41	6	17	43	4	11	26
Thallium Tl	µg/L	0.8	0.005	0.001	0.002	0.005	0.0001	0.001	0.003
Tin Sn	µg/L		0.095	0.014	0.040	0.100	0.009	0.025	0.062
Titanium Ti	µg/L		35	5.2	15	37	3.2	9.2	22
Vanadium V	µg/L		5.20	0.77	2.2	5.5	0.47	1.4	3.4
Zinc Zn	µg/L	30	3.40	0.50	1.4	3.6	0.31	0.88	2.2

Note: Values in bold italics exceed CCME guidelines

3.3 Overall Tail Lake Mass Balance Calculations

The contaminant load and water quality calculations for Tail Lake were set up in an Excel spreadsheet to calculate solute loadings and concentrations on a monthly basis as follows:

- The calculations for Tail Lake tracked the inventory of contaminants in the lake with time through the operational period and beyond;
- The total contaminant inventory was used to calculate the water quality at the beginning of each time step, which was then used to track contaminant concentration changes through dilution, nutrient degradation reactions and/or operational decant for that time step;
- At the end of the time step, the lake inventory was updated to accommodate the total **gain (loading)** and/or **loss (removal)** of solute from the system. **Loadings** of solutes included all flows to Tail Lake from all the sources (mill, mine water, sewage and background) and products generated from nutrient degradation reactions and **losses** included pore water lock-up, decant or discharges, and removals by nutrient degradation reactions.

As discussed later, the rise in water level in Tail Lake will be minimised, and the lake will remain relatively shallow. Therefore, in simple terms, Tail Lake was regarded as a completely mixed system. The overall Tail Lake mass balance calculation for each solute at each time step was as follows:

$$TM_t = MC + MI - MO - MR + MG \quad \dots(3.5)$$

Where TM_t = mass contained at the end of the time step t (kg),
 MC = mass contained at the beginning of the time step (kg),
 MI = mass in all **inflows** to Tail Lake over the entire time step (kg),
 MO = mass in all **outflows** from Tail Lake over the entire time step (kg),
 MR = mass **removed** by nutrient degradation or conversion reactions (kg), and
 MG = mass **generated** by nutrient degradation or conversion reactions (kg).

The loadings in the inflows included all the sources discussed in the preceding sections. Background loadings to Tail Lake were included using the estimated surface runoff flows and concentrations background solute concentrations measured in Tail Lake outflow.

The solute concentration at the end of the time step was then calculated as follows:

$$SC = TM_t / V_t / 1000 \quad \dots(3.6)$$

Where SC = solute concentration at the end of time step t (mg/L),
 TM_t = mass contained at the end of time step t (kg),
 V_t = Volume of free water contained in Tail Lake at the end of time step t (m^3), and
 1000 = conversion factor from kg/m^3 to mg/L.

The solute loading to Tail Lake included degradable cyanide and its derivative compounds (predominantly cyanate) and ammonia-N. A number of nutrient degradation reactions are expected to occur within Tail Lake. These are presented and discussed briefly in the following sections.

3.4 Nutrient Degradation Reactions

3.4.1 Cyanide and Cyanate

Residual cyanide present in the tailings water will oxidize to produce cyanate according to the following reaction:



As shown by the results from the aging test (see Table 3.6), cyanate hydrolyses relatively rapidly to ammonia. The reaction stoichiometry for cyanate conversion (hydrolysis) to ammonia is as follows:



Using the stoichiometry from this equation, the production of ammonia can be calculated. The approximate rate of hydrolysis was estimated from the aging test results.

3.4.2 Natural Ammonia-N Degradation Processes

Ammonia nitrogen in open water systems may behave in one or more of the following three ways:

1. It may serve as a prime nutrient to support phytoplankton and rooted aquatic growths. Ammonia is assimilated directly by phytoplankton. The growth of phytoplankton requires that appropriate conditions exist, which includes sufficient nutrients and sunlight.
2. Some proportion will be lost to the atmosphere as gaseous NH_3 , when its partial pressure in the water is greater than that in the atmosphere. The degree of loss is a function of pH which controls the ionization of ammonia as follows:



At a pH of 9 to 9.5 about 40 to 50% of the ammonia nitrogen is present as ammonia and will be volatilised. However, at pH of about 7, almost all of the ammonia nitrogen is ionized and little loss will occur.

3. Biological nitrification occurs naturally in lakes and water bodies. Biological nitrification occurs when ammonia-nitrogen is first oxidized to nitrite (NO_2^-) and then to nitrate (NO_3^-) by nitrifying bacteria. The rate of reaction is directly proportional to the bacterial population, availability of oxygen and the temperature of the water column, and therefore generally occurs in the epilimnion or upper aerated part of a water body. The growth rate of nitrifying bacteria typically is rapid when appropriate conditions exist, which includes sufficient nutrients and a

sufficiently elevated temperature. At temperatures above 15°C biological activity is usually sufficiently rapid to achieve effective removal rates. When temperatures drop below 10°C, rates become very slow. This also means that the biological processes will be most effective during summer and will “shut-down” when the water body freezes over.

Since the pH of the lake water is expected to vary between 7 and 8, volatilization of ammonia is not expected to significantly reduce ammonia-N concentrations. Therefore, mechanisms 1 and 3 are expected to cause ammonia-N removal from Tail Lake.

As noted before, the rate of biological removal depends on the availability of nutrients and sunlight. In natural environments, phosphorus most commonly is the rate limiting nutrient that controls biological activity. Phosphorus concentrations typically are low in mine effluent waters, which would restrict bacterial and algal growth. Under the proposed mine operating plan, treated sewage water would be discharged to Tail Lake. This flow would contain some residual phosphorus, which will likely stimulate natural removal. It is furthermore possible to enhance natural removal by phosphorus addition to Tail Lake. For example, at the Colomac Mine Site, NT, phosphorus was added with great success to cyanide contaminated tailings water to enhance the growth of natural populations of algae and bacteria. At that site, elevated concentrations of cyanide, thiocyanate, ammonia and nitrate have effectively been removed from the tailings storage area as a result. The potential removals that may occur within Tail Lake are evaluated in the following sections in the context of the removal that was observed at the Colomac site (Chapman *et al.* 2003).

Assessment of Natural Removal of Ammonia-N

In the following evaluation, the potential for natural removal of ammonia-N from Tail Lake is estimated from the rates of removal observed at the Colomac Mine Site (Chapman *et al.* 2003) and relies on a comparison of conditions between the two sites.

Briefly, at the Colomac Site, natural removal of cyanide compounds has led to the formation of very high concentrations of ammonia-N in the Tailings Storage Facility (Tailings Lake), containing up to 48 mg/L ammonia-N, and, in the adjacent Zone 2 Pit (Pit Lake) containing up to 24 mg/L ammonia-N. In addition, Fuscum Lake, a lake adjacent to the Tailings Lake, was contaminated with water from Tailings Lake resulting in an ammonia-N concentration of about 15 mg/L.

In Fuscum Lake, ammonia-N was removed to less than 0.2 mg/L without any enhancement by phosphorus addition. The removals observed in this lake provide estimates of baseline removals that may be expected.

In the Tailings Storage Facility and the contaminated pit lake, natural removal of ammonia-N was enhanced by the addition of phosphorous (as mono-ammonium phosphate). Typically, phosphorus additions are targeted to achieve an N:P ratio of about 7 to 8:1.

A summary of the rates of removal observed for the three contaminated lakes is provided in Table 3.9. The table also provides the phosphorus and ammonia-N concentrations. The Fuscum

Lake data represent the initial and final water quality data. The Pit Lake and Tailings Lake data represent the results obtained in the epilimnion over a period of 70 days. (Both Tailings Lake and the Pit Lake exhibit a typical thermal stratification during the summer months, with the thermocline reaching a maximum depth of between 5 m and 6 m. It is within the warmer upper layer or epilimnion that all the ammonia-N removal occurs.) The rate of removal calculated for Fuscum Lake represents the average over the entire summer period. The Tailings Lake and Pit Lake rates pertain to a single season removal only. These rates therefore are directly comparable.

Table 3.9: Summary of Natural and Enhanced Ammonia-N Removal Rates at Colomac (after Chapman *et al.* 2003)

Location	Conditions	Phosphorus		Ammonia-N		Ammonia-N Removal (mg/m ² /day)
		Initial (mg/L)	End of Season (mg/L)	Initial (mg/L)	End of Season (mg/L)	
Fuscum Lake	Natural	0.018	-	14	0.19	148
Pit Lake	Enhanced	0.8	0.6	22	6 (ongoing)	1400
Tailings Lake	Enhanced	0.9	0.2	48	9 (ongoing)	2000

To enhance natural removal rates, phosphorus was added to Tailings Lake and to the Pit Lake during the spring thaw to achieve initial concentrations of about 1 mg/L of total phosphorus. Over the course of one summer season (June to August), the ammonia-N concentration decreased from about 45 mg/L to about 9 mg/L in the upper (heated) layer of Tailings Lake. The Pit Lake is more sheltered to sunlight by high walls, and the ammonia concentration decreased from about 24 mg/L to less than 6 mg/L over a similar period. As shown in the table, the natural rate of ammonia-N removal was enhanced by about an order of magnitude by adding excess phosphate to the water.

Based on the natural ammonia-N removal observed in Fuscum Lake, and enhanced removal rates observed in the Pit Lake and in Tailings Lake, it is concluded that natural or enhanced removal are viable processes for ammonia-N removal in Tail Lake. To estimate the effectiveness of these processes in Tail Lake, it is necessary to consider the differences in conditions between the two sites.

Nutrients

As noted above, growth of phytoplankton requires that sufficient nutrients are present. The sewage treatment plant discharge, which will be pumped to the Tail Lake, is expected to contain approximately 1 mg/L of phosphorus. On average, assuming that phosphorus will annually be removed from solution, as is observed elsewhere, the phosphorus concentration would be expected to fluctuate to between < 0.07 mg/L to a maximum of about 0.12 mg/L. These concentrations are in the same range as the concentrations detected in Fuscum Lake, and therefore would be supportive of natural removal of ammonia-N in Tail Lake.

Sunlight

Table 3.10 below compares the average sunshine hours for nearby meteorological stations, and the exposure profiles are shown in Figure 3.7. The Tail Lake site is located at a latitude of about 67°N,

and the Colomac Site is located at a latitude of 64°N. As shown in the table, Kugluktuk is located at about 67° N and on average experiences about 1,629 hours of sunshine. The sunshine exposure for Colomac is expected to be similar to that of Baker Lake, i.e. 1,843 hours. The Tail Lake (represented by Kugluktuk) and Colomac (Baker Lake) sunshine profiles are very similar, as shown in Figure 3.7. These comparisons are supportive of natural removal of ammonia-N from Tail Lake. However, due to the lower sunshine exposure at Tail Lake site, the ammonia-N removal is expected to be somewhat lower than that observed at the Colomac Site (i.e. about 85%).

Table 3.10: Total Bright Sunshine (hours)

Station	Latitude	Longitude	Annual
Baker Lake	64° 18' N	96° 05' W	1,843
Kugluktuk (Coppermine A)	67° 50' N	115° 7' W	1,629
Norman Wells A	65° 17' N	126° 48' W	1,854
Yellowknife A	62° 28' N	114° 27' W	2,277

(Source: Environment Canada 1951-1980 Climate Normals)

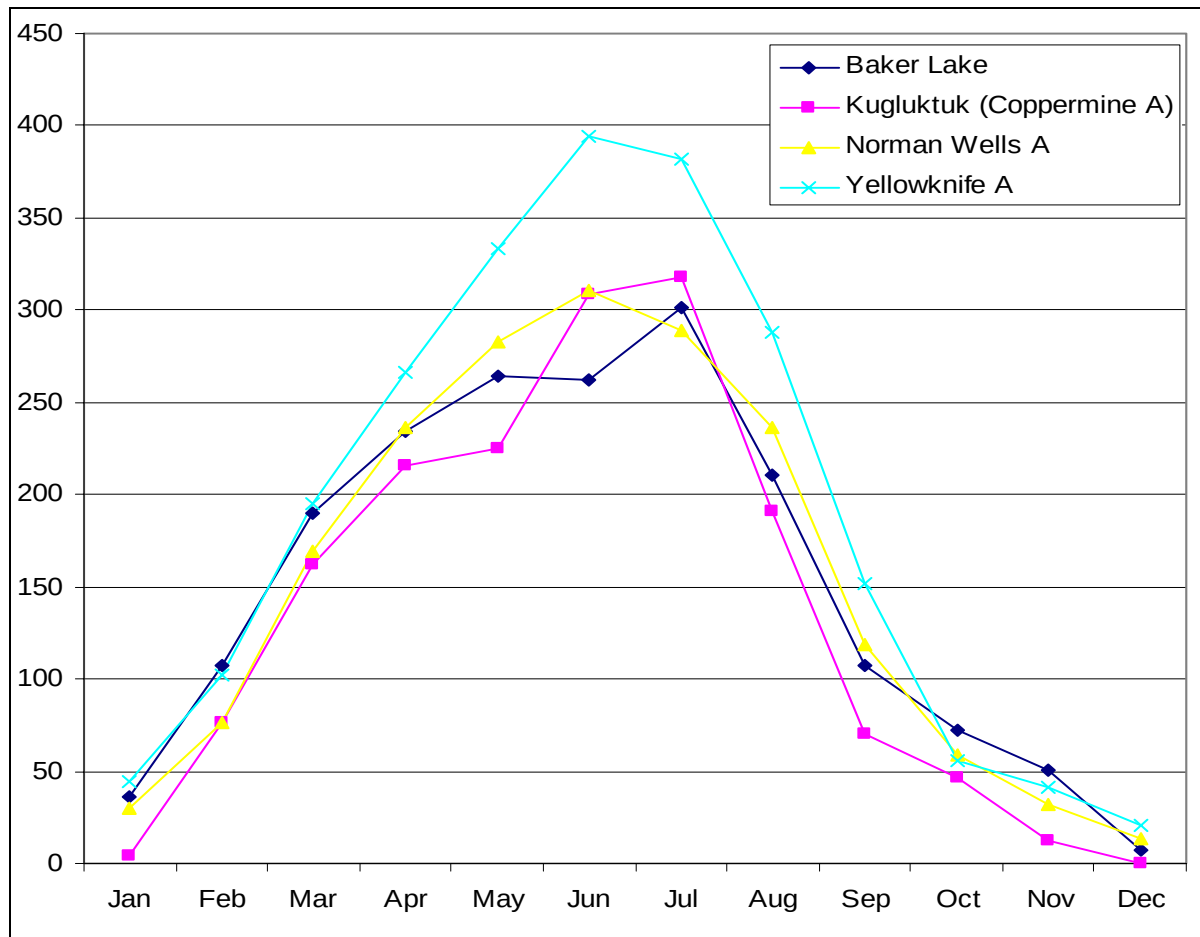


Figure 3.7: Average Monthly Sunshine Profiles

Thermal Profile/Stratification

The maximum operating depth of Tail Lake is expected to be about 5 m to 6 m. Therefore, the entire water body is expected to be at a uniform temperature, and ammonia removal would be expected to occur throughout. These conditions are similar to those in Fuscum Lake (average depth of 4 m) and in the epilimnion of the Pit Lake and Tailings Lake.

Net Removal Capacity at Tail Lake

To estimate the potential ammonia-N removal that may occur in Tail Lake, the removal rates given in the last column of Table 3.9 were corrected by multiplying them with a factor of 0.85 for the reduced sunshine exposure. These corrected rates were then used to estimate potential natural and enhanced removal rates for the Tail Lake as follows:

1. The Tail Lake pond surface area was calculated from the pond level.
2. The adjusted removal rate was then multiplied by the surface area to obtain the total removal capacity.
3. Removal was assumed to occur only from June through September.

As noted previously, the removal would occur by one of two mechanisms. In the first mechanism, ammonia is taken up directly as a nutrient in cell growth. The biomass that is generated would sink of the bottom of the lake and accumulate as lake sediment. Some proportion of the nitrogen could be recycled to the water column as the biomass decays. In the second mechanism, ammonia is oxidized to nitrate in a process called nitrification as discussed in the next section.

3.4.3 Nitrification

Nitrification, or ammonium oxidation, is a two-step respiratory process occurring in sediment (benthic nitrification) or the water column (pelagic nitrification) (Grady and Lim 1980). In the first step, mediated by *Nitrosomonas* micro-organisms, ammonia is oxidized to nitrite as follows:



In the second step, is mediated by *Nitrobacter* micro-organisms, nitrite is oxidized to nitrate as follows:



Both reactions are energy yielding and therefore occur independently of each other. Oxygen serves as the electron acceptor, and therefore an aerobic environment is required for these reactions to occur. Indeed, oxygen is the only electron acceptor that can be utilized by *Nitrosomonas* and *Nitrobacter* micro-organisms. Therefore, partial or incomplete oxidation of nitrite to nitrate would occur only if the oxygen demand by ammonia oxidation exceeds available oxygen in the water

column. (The potential for oxygen limiting conditions is assessed in the next chapter. In the interim, it can be shown that the complete oxidation of 1.5 mg/L ammonia to nitrate requires about 6.3 mg/L O₂. Since the solubility of oxygen in water at the expected temperature in Tail Lake is well above this oxygen demand (i.e. in the range of 10 mg/L for static conditions), it is unlikely that the system will become oxygen deficient. It should be noted that oxygen diffusion and surface mixing induced by wind will further enhance the availability of oxygen. At similar concentrations, ammonia is therefore expected to be fully oxidized to nitrate.)

Excluding oxygen limitations, the growth limiting substrate for *Nitrosomonas* (ammonia oxidation step) usually is ammonia; the growth limiting substrate for *Nitrobacter* (nitrite oxidation step) usually is nitrite. The growth rate of *Nitrobacter* is much greater than the growth rate of *Nitrosomonas* for a wide range of conditions (Water Pollution Control Federation, 1983; Grady and Lim 1980). Therefore, because the nitrification process is sequential (i.e. ammonia → nitrite → nitrate), little or no nitrite will result from the oxidation of ammonia. Furthermore, because the growth rate *Nitrobacter* is much greater than the growth rate of *Nitrosomonas*, the *Nitrobacter* will utilize the excess nitrite from the explosives and the sewage treatment plant discharge, and it too will be depleted from the water column.

Further evidence for the depletion of nitrite from the water column can be found in the reported oxidation rates. Nitrite oxidation rates ranging from 0.7 to 4.2 x 10⁻⁴ mg NO₂-N/L/h for low temperature conditions (Bianchi *et al.* 1999). For example, using the lower end of the range, it can be shown that during the open water season (approximately 180 days) in excess of 1.8 mg/L of nitrite may be oxidized in Tail Lake water.

3.4.4 Denitrification

The final step in the biological processes contributing to the degradation of ammonia is denitrification wherein nitrate is reduced to nitrogen gas. This is an anaerobic process and occurs at depth below the aerated zone. Because of lower temperatures at depth, de-nitrification is likely to proceed at a slower rate than nitrification. In-situ measurements of denitrification rates for a reservoir in a cold climate ranged from 25 to 450 µmol N₂ m⁻² h⁻¹ (mean 291 µmol N₂ m⁻² h⁻¹) (Tomaszek J.A. & E. Czerwieniec 2002). Similar rates of denitrification were also observed at the Colomac Site, where denitrification was observed to continue under ice throughout winter.

3.4.5 Summary

Removal calculations for cyanide and ammonia were included in the spreadsheet model. A simple empirical approach was adopted for these calculations and all calculations were applied only for open water conditions. The calculations include the intermediate step of ammonia oxidation to nitrite, followed by oxidation to nitrate. The reaction rate constants were estimated from available information for the tailings, those observed at the Colomac Site and additional data published for natural systems. The estimated removal rates for each parameter were as shown in Table 3.11. The table shows removal rates for a 'base case' which generally correspond to removal rates observed for

natural systems, and an 'enhanced case' which reflect rates estimated from the Colomac site rates corrected for site specific conditions.

Table 3.11: Summary of Assumed Conversion Rates

Parameter	Base Case (kg/m ² /month)	Enhanced (kg/m ² /month)
Free Cyanide to Ammonia-N	0.000036	0.00029
Total Cyanide to Ammonia-N	0.00013	0.0011
WAD CN to ammonia	0.000036	0.00029
Cyanate (CNO) to Ammonia-N	0.034	0.28
Ammonia-N oxidation to NO ₂ -N	0.0044	0.036
NO ₂ -N oxidation to NO ₃ -N	0.00023	0.0012
Denitrification (NO ₃ -N to N ₂)	0.0012	0.0023

It should furthermore be noted that phosphorus will also be removed from solution through biological activity. Because of the comparatively low overall concentration of phosphorus, its removal was not included in the calculations.

3.5 Summary of Conservative Assumptions

In conclusion, a brief summary of some of the conservative assumptions that have been adopted is presented in Table 3.12.

Table 3.12: Summary of Selected Conservative Assumptions Adopted

Item	Component/Source	Conservative Assumption	Reason
1	Waste Rock Storage	137,000 tonnes in storage from day 1 for 36 months	Actual schedule indicates a maximum storage of 137,000 by month 13, with complete removal by 32 months
2	Waste Rock and Fill solute release	Solute occurs from day one and is instantaneously transported to Tail Lake Outflow/ Doris Lake Outflow	Wetting of the fill/rock may take several seasons before solute release can occur; frozen zones will further affect solute release; solute attenuation will occur by sorption reactions which will further delay the transport of the solutes
3	Site Fill	All of the fill will produce solutes at an equal rate	Buildings and concrete slabs will cover a significant proportion of the mill site which will reduce the solute release proportionately
4	Tailings	Adopted maximum solute concentrations from the blended effluent in the calculations	Aging tests generally showed a reduction in solute concentrations with time
5	Salinity Release	Calculations include salinity release from porewater and from sediment erosion	Double accounting salinity release since the settling tests were completed on 'whole' samples, i.e. with porewater in tact
6	Underground workings	assumed solutes and blast residues released from waste rock backfill in underground workings commences from day 1	Underground workings are expected to frozen and dry and solute release from backfill is unlikely

4 Conceptual Discharge Scenarios

4.1 Introduction

In this chapter a series of water management strategies or scenarios for Tail Lake are identified and briefly described. These scenarios are then evaluated by assessing effects on water accumulation in Tail Lake, water quality in Tail Lake, and, effects of discharge on receiving water quality in Doris Creek under the following assumptions. The first premise is that MMER criteria would be met before any discharge could be permitted. The second premise is that the discharge can be regulated to meet CCME guidelines for the protection of freshwater aquatic life downstream of the mixing zone, i.e. downstream of the waterfall in Doris Creek.

4.2 Modeling Approach

In general, the modelling approach was as follows. For each scenario where Tail Lake discharge would be managed (prior to reaching the FSL), it was assumed that the monthly discharge rate would be controlled to be proportional to Doris Creeks' hydrograph. To estimate the maximum allowable discharge volume, the discharge to Doris Creek was increased until a parameter in Doris Creek was at its CCME guideline. Only total metals were considered and, where observed, potential nutrient exceedances were recorded. The reason this approach was adopted is that the nutrients are degradable and degradation rates can be enhanced with little additional effort.

In most cases, total copper concentration was the controlling parameter, and discharge flows were limited to meet the CCME guideline for this parameter in Doris Creek. However, chromium and selenium concentrations were also predicted to be at their respective CCME guidelines in Doris Creek for certain scenarios.

The potential scenarios have been selected to represent a wide range of possible operating conditions. The following assumptions were adopted:

- Except where specified otherwise, average flow conditions represent a mean annual precipitation of 207 mm, a mean annual site runoff of 180 mm and a mean annual evaporation rate of 220 mm;
- No precautionary steps are assumed to have been taken to control or limit sediment release from the shoreline of Tail Lake and base case sediment release rates are adopted (see Table 3.8);
- Waste rock storage will occur for 36 months from start of operations at the maximum scheduled storage of 137,000 tonnes;
- Blast residues were assumed to be 10% of explosive usage; and,
- Nutrient degradation rates proceed at base case rates (see Table 3.11).

Sensitivity analyses to assess effects of deviations from these assumptions on water quality in Tail Lake, Doris Creek and the water management strategy are presented in a later section.

4.3 Assessment of Discharge Scenarios

4.3.1 Scenario Descriptions

Scenario 1 – ‘No Intervention’

In the ‘No Intervention’ case, conditions were adopted to first assess the overall effect of contaminant accumulation in Tail Lake, and, then to assess the potential effects on receiving water quality when it becomes necessary to release water, i.e. when the FSL of Tail Lake is reached. The scenario was assessed for average flow conditions.

As a worst case it was assumed that there is no conversion of cyanide compounds and no degradation of nutrients. This is very conservative since the laboratory tests and observations elsewhere clearly showed that nutrient degradation will occur.

Scenario 2 – ‘No Intervention’ with Nutrient Degradation

This scenario was designed to demonstrate the effects of nutrient degradation on overall water quality. Therefore, the conditions and assumptions were the same as those adopted for Scenario 1, except that nutrients were allowed to degrade at the base case rates.

Scenario 3 – Minimise Management Period

The purpose of this scenario was to establish the minimum time period for which active discharge would occur. Therefore, the discharge rate was maximised from year 1, while still meeting CCME guidelines for copper in Doris Creek downstream of the waterfall. The scenario was completed for average flow conditions.

Scenario 4 – No Discharge in Year 1 and Minimise Management Period

Consideration may be given to not discharge within the first year of operation in order to verify the predicted water quality. Water quality measurements in Tail Lake during the first year of operation can be used to verify the modelled water quality and would provide confidence in a subsequent discharge strategy. Therefore, this scenario is designed to assess the potential impact of not discharging during the first year on the overall strategy of ‘minimum operational period’.

The scenario therefore assumes that there would be no discharge in year 1, but that in subsequent years the discharge rate would be maximized to maintain the copper concentration below 2 µg/L in Doris Creek.

Average flow conditions with base case nutrient degradation rates were evaluated.

Scenario 5 – ‘Balanced’ Discharge Strategy

All the discharge scenarios above determined the annual discharge to meet CCME guidelines in Doris Creek, i.e. the flow is maximised to not exceed a copper concentration of 2 µg/L in Doris Creek. However, if the discharge from Tail Lake is reduced, the copper concentration in Doris Creek will decrease during the active discharge period. If the discharge flow is reduced to the point where the discharge is lower than the average annual inflow to Tail Lake, water will be accumulated in Tail Lake and ultimately it will reach the FSL. At that time, there will be a step increase in the discharge rate from the controlled rate to the net inflow rate. This step increase will lead to and concurrent increase in concentrations in Doris Creek. Initially, the copper concentration will be elevated whereas when the step increase in flows occur the copper concentration will be substantially lower. This scenario examines the discharge rate that would result in a copper concentration during the early stages that would be balanced with the increase that would occur when the discharge rate increases once the FSL is reached. Hence the initial effects would be ‘balanced’ with the later effects.

Scenario 6 – Intermediate Flow Discharge Strategy

The purpose of this scenario is to assess effects of a flow condition that is halfway between the maximum flow rate that would be associated with the minimum discharge management time (Scenario 3), and that of the ‘balanced’ discharge strategy (Scenario 5).

Scenario 7 – Effect of High Flow on ‘No Intervention’ Scenario

This scenario is the same as Scenario 1, but with a 1 in 500 year wet year in the first year of operation followed by average flow conditions. The following assumptions were adopted:

- Average flow conditions represent a mean annual precipitation of 207 mm, a mean annual site runoff of 180 mm and a mean annual evaporation rate of 220 mm.
- A 1:500 wet year event represents a runoff of 335 mm.

Other assumptions remained as before.

Scenario 8 - Effects of High Flow on Minimised Management Period

This scenario is the same as Scenario 3, but with a 1 in 500 year wet year in the first year of operation followed by average flow conditions. The following assumptions were adopted:

- Average flow conditions represent a mean annual precipitation of 207 mm, a mean annual site runoff of 180 mm and a mean annual evaporation rate of 220 mm.
- A 1:500 wet year event represents a runoff of 335 mm.

Other assumptions remained as before.

Scenario 9 – Effects of High Flow on Intermediate Flow Discharge Strategy

This scenario is the same as Scenario 6, but with a 1 in 500 year wet year in the first year of operation followed by average flow conditions. The following assumptions were adopted:

- Average flow conditions represent a mean annual precipitation of 207 mm, a mean annual site runoff of 180 mm and a mean annual evaporation rate of 220 mm.
- A 1:500 wet year event represents a runoff of 335 mm.

Other assumptions remained as before.

The water quality modeling results are presented and discussed below.

4.3.2 Results and Discussion

The results from the scenarios modelled are provided in Appendix H. The results for each scenario are presented as follows. First, a schematic is presented illustrating the copper loadings at year 2 at the end of operations, when peak concentrations are predicted in Doris and immediately after the spillway is lowered (i.e. post closure conditions). Second, a series of plots are shown for key parameters within Tail Lake, and within Doris Creek downstream of the mixing zone. Third, a summary table is included that show the estimated maximum concentrations for each of Tail Lake, Doris Creek and Little Roberts Lake outflow. This is followed by a table showing concentrations for years 1 to 10, and finally a table showing total loadings at each of these loadings for the first 10 years.

The results are summarised in Table 4.1 and Table 4.2 for Tail Lake and Doris Creek respectively. These tables provide i) the year and maximum concentration reached in Tail Lake for each parameter (except for TDS and associated parameters), and ii) the year and maximum concentration reached in Doris Creek when discharge first commences (again except for TDS and associated parameters).

As reported by AMEC, the tailings water generated from the metallurgical program passed toxicity benchmark tests. The tailings water discharged to Tail Lake will be diluted by water already in Tail Lake and freshwater runoff that will enter the lake subsequent to deposition. It is therefore expected that the water in Tail Lake too will pass toxicity criteria at all times. Modeling results further indicate that the water in Tail Lake should meet MMER criteria at all times. There should therefore be no constraint on discharging water from Tail Lake. However, as discussed later in Section 5, before any discharge commences, Tail Lake water would be submitted for toxicity testing and chemical analysis to ensure that MMER criteria are met.

As shown in Table 4.2, the ‘un managed’ scenarios (Scenarios 1, 2 and 7), where Tail Lake is allowed to reach FSL and then spill naturally, all parameters are likely to meet CCME guidelines in Doris Creek except for nitrite. Nitrite exceedance could occur only in the very unlikely case that there is no oxidation of nitrite, and, even then would only marginally exceed the CCME guideline (maximum concentration of 0.027 mg/L compared to the CCME guideline of 0.018 mg/L).

Considering that the water could be retained in Tail Lake for five or more years before any water would need to be discharged, nitrite is not considered to represent a concern. Furthermore, as discussed before, nitrite is chemically oxidized by oxygen and there is ample evidence that nitrite will oxidize rapidly within the Doris Creek.

The model results presented in Table 4.2 for the managed discharge scenarios also suggest that nitrite concentrations could be problematic (i.e. Scenarios 3 and 4) under the conservative assumptions adopted for these calculations. The predicted maximum nitrite concentrations in Doris Creek for these scenarios range from 0.026 to 0.032 mg/L compared to the CCME guideline of 0.018 mg/L. It should be noted that if these concentrations arise, they would occur only occur for the initial 1 to 2 years of discharge. It is furthermore important to note that no allowance was made for additional nitrite oxidation within the mixing zone in Doris Creek. The waterfall will oxygenate the water resulting in the oxidation of nitrite. (The oxygen demand for such low concentrations of nitrite will be minimal and will not affect dissolved oxygen concentrations in Doris Creek). Generally nitrite is not observed to persist in an aerated natural system, such as in Doris Creek, and the low concentrations would readily be oxidized to nitrate. Therefore, the inferred 'nitrite exceedances' are considered unlikely to occur.

The strategy of not discharging in year 1 of operations (Scenario 4) has the added advantage that the water quality can be characterized for a full year and short term changes can be evaluated well in advance of releasing any water from Tail Lake.

Discharge strategies not only affect the maximum water level that will be reached in Tail Lake, but also the period for which active management will be required. These effects, together with key observations, are summarised in Table 4.3. Key observations include:

- Provided that nitrite does not pose a problem, the shortest time that a stable ('walk away') conditions (i.e. requiring no additional water management can be reached) is projected to be about five years, inclusive of the operational period (Scenario 3). In this scenario the water level in Tail Lake will reach a maximum elevation of 29.3 m, in Year 3 and will then decrease until the original lake elevation of 28.3m is reached in Year 5. The North Dam can then be breached since, to maintain the original water elevation in Tail Lake, the discharge rate would be reduced to the net inflow into Tail Lake. Consequently the breach can be undertaken without any risk to the receiving environment. The copper concentration in Tail Lake is projected to decrease below the CCME guideline by Year 8.
- Not discharging in year 1 (Scenario 4) eliminates the initial potential risk associated with nitrite releases and a stable 'walk away' condition can be reached in a similar timeframe to Scenario 3. However, the maximum water level in Tail Lake increases by about 1.1m from 29.3 to 30.4m.
- The 'balanced effects' discharge strategy (Scenario 5) will minimise concentrations below CCME guidelines in Doris Creek throughout operations and the active water management period. However, the Tail Lake discharge system would have to be operated for up to 12 years when the FSL is reached. Thereafter, the site would need to be monitored annually until about

Year 34, when the copper concentration in Tail Lake is expected to decrease below CCME guidelines. At that time, the North Dam can be breached for final closure.

- The intermediate flow case (Scenario 6), would meet CCME guidelines in Doris Creek at all times. If operated continuously, the FSL of Tail Lake would be reached at about Year 35. However, the copper concentration in Tail Lake should decrease to below the CCME guidelines by about Year 20, and it will be possible to breach the North Dam at that time. Consequently the FSL would not be reached and the maximum elevation would be about 31.9m.
- Very wet conditions at the beginning of operations (Year 1) generally result in improved water quality in Tail Lake but marginally extend the active water management period as indicated by the results for Scenarios 8 and 9.

4.4 Conclusions and Recommendations

4.4.1 Summary of Results and Conclusions

In summary, the water quality modelling results and discharge scenario evaluations indicate that:

- Water management strategies are available that will not cause exceedance of CCME guidelines in Doris Creek;
- Alternative strategies are also available that may cause marginal exceedances of CCME guidelines in Doris Creek, however, such exceedances would be of short duration and will significantly reduce the requirements (time and management) for active operation; and,
- The range of discharge conditions that remain protective of the receiving environment indicate that there is significant flexibility available to manage Tail Lake water to still meet CCME guidelines in Doris Creek.

The results indicate that adaptive management of the water in Tail Lake is possible. This means that while one strategy might be selected as a preferred strategy, it is not the only strategy that will be protective of the receiving environment. More importantly, if conditions or actual water quality in Tail Lake deviate from those predicted in the water quality modeling, then it will be possible to switch to an alternate strategy that would remain protective of the receiving environment without compromising the tailings deposition and overall water management for the site.

Table 4.1: Summary of Estimated Maximum Concentrations in Tail Lake for Average Flow Conditions (180 mm/year Yield)

Parameter	Units	MMER Criteria	CCME Guidelines	Scenario / Maximum Concentration in Tail Lake									
				1	2	3	4	5	6	7	8	9	
Year of Occurrence				Year 2	Year 2	Year 2	Year 2	Year 2	Year 2	Year 2	Year 2	Year 2	
pH			6 to 9	7 to 8	7 to 8	7 to 8	7 to 8	7 to 8	7 to 8	7 to 8	7 to 8	7 to 8	
TDS	mg/L	15		652	652	1583	1377	584	732	646	1296	694	
TSS	mg/L			4.8	4.8	3.7	3.8	4.4	4.6	5.0	4.7	4.7	
Free CN	mg/L	1	0.0050	0.0060	0.0025	0.0036	0.0025	0.0027	0.0030	0.0052	0.0028	0.0024	
Total CN	mg/L			0.059	0.025	0.035	0.025	0.026	0.029	0.051	0.027	0.023	
WAD CN	mg/L			0.0080	0.0034	0.0048	0.0034	0.0036	0.0040	0.0069	0.0037	0.0032	
CNO	mg/L			6.6	2.8	4.0	2.8	3.0	3.3	5.7	3.1	2.6	
SCN	mg/L			0.090	0.090	0.118	0.099	0.094	0.101	0.078	0.098	0.086	
Sulphate	mg/L			83	83	109	92	87	93	72	90	79	
Chloride	mg/L			422	422	1051	947	418	456	419	863	432	
Total Ammonia	mg/L		0.97	0.99	1.01	1.31	0.94	1.06	1.15	0.86	1.04	0.93	
Nitrate	mg/L			5.4	5.2	6.8	5.7	5.3	5.8	4.7	5.6	4.9	
Nitrite	mg/L			0.73	0.39	0.53	0.39	0.42	0.45	0.64	0.42	0.37	
Alkalinity	mg/L			52	52	64	56	53	56	48	56	51	
Phosphate-P	mg/L			0.1537	0.1537	0.2183	0.1953	0.1616	0.1766	0.1361	0.1847	0.1542	
Org. Carbon	mg/L			6.4	6.4	4.8	4.7	6.4	6.2	6.6	6.1	6.3	
Hardness CaCO3	mg/L			100	100	127	109	104	111	90	109	98	
Total Metals													
Aluminium Al	mg/L	0.5	0.10	0.15	0.15	0.14	0.13	0.12	0.15	0.16	0.17	0.15	
Antimony Sb	mg/L			0.0138	0.0138	0.0194	0.0171	0.0145	0.0158	0.0122	0.0164	0.0138	
Arsenic As	mg/L			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Barium Ba	mg/L			0.0097	0.0097	0.0125	0.0106	0.0101	0.0108	0.0085	0.0106	0.0093	
Cadmium Cd	mg/L			0.000038	0.000051	0.000066	0.000056	0.000053	0.000057	0.000044	0.000055	0.000048	
Calcium Ca	mg/L	0.3	0.0010	225	225	295	248	234	252	194	245	215	
Chromium Cr	mg/L			0.0060	0.0060	0.0078	0.0066	0.0062	0.0067	0.0052	0.0065	0.0057	
Cobalt Co	mg/L			0.0094	0.0094	0.0123	0.0103	0.0098	0.0105	0.0081	0.0102	0.0089	
Copper Cu	mg/L			0.0020	0.009	0.011	0.009	0.009	0.010	0.007	0.009	0.008	
Iron Fe	mg/L			0.30	0.17	0.15	0.14	0.15	0.18	0.18	0.19	0.18	
Lead Pb	mg/L	0.2	0.0020	0.00038	0.00038	0.00047	0.00041	0.00039	0.00040	0.00033	0.00040	0.00036	
Lithium Li	mg/L			0.0054	0.0054	0.0055	0.0054	0.0050	0.0049	0.0056	0.0051	0.0049	
Magnesium Mg	mg/L			8.8	8.8	10.6	9.3	8.9	9.4	8.1	9.3	8.4	
Manganese Mn	mg/L			0.026	0.026	0.034	0.028	0.027	0.029	0.022	0.028	0.025	
Mercury Hg	mg/L			0.00010	0.000116	0.000107	0.000107	0.000095	0.000117	0.000124	0.000132	0.000116	
Molybdenum Mo	mg/L	0.5	0.073	0.0081	0.0081	0.0107	0.0090	0.0085	0.0091	0.0070	0.0089	0.0078	
Nickel Ni	mg/L			0.025	0.008	0.008	0.010	0.008	0.008	0.008	0.007	0.008	0.007
Potassium K	mg/L			37	37	49	41	39	42	32	41	36	
Selenium Se	mg/L			0.0010	0.00096	0.00096	0.00081	0.00081	0.00084	0.00095	0.00101	0.00102	0.00095
Silver Ag	mg/L			0.00010	0.00011	0.00011	0.00013	0.00012	0.00011	0.00012	0.00011	0.00012	0.00011
Sodium Na	mg/L	0.5	0.00080	117	117	386	293	112	178	116	297	164	
Thallium Tl	mg/L			0.000041	0.000041	0.000048	0.000042	0.000042	0.000043	0.000040	0.000043	0.000040	
Tin Sn	mg/L			0.00209	0.00209	0.00296	0.00262	0.00220	0.00241	0.00186	0.00252	0.00211	
Zinc Zn	mg/L			0.021	0.021	0.027	0.023	0.022	0.023	0.018	0.023	0.020	

Note: Shaded values exceed CCME guidelines for the protection of Freshwater Aquatic Life

Table 4.2: Summary of Estimated Maximum Concentrations in Doris Creek for Average Flow Conditions (180 mm/year Yield)

Parameter	Units	MMER Criteria	CCME Guidelines	Scenario / Maximum Concentration in Doris Creek								
				1	2	3	4	5	6	7	8	9
Year of Occurrence				Year 9	Year 9	Year 3	Year 3	Year 12	Year 3	Year 8	Year 3	Year 3
pH			6 to 9	7 to 8	7 to 8	7 to 8	7 to 8	7 to 8	7 to 8	7 to 8	7 to 8	7 to 8
TDS	mg/L			172	172	216	227	161	160	172	203	159
TSS	mg/L			7.0	7.0	6.8	7.0	7.0	6.9	7.0	6.9	6.9
Free CN	mg/L	1	0.0050	0.0002	< DL	0.0002	0.0002	< DL	0.0001	0.0002	0.0002	0.0001
Total CN	mg/L			0.004	0.002	0.004	0.004	0.002	0.003	0.004	0.003	0.003
WAD CN	mg/L			0.0002	< DL	0.0003	0.0002	< DL	0.0001	0.0002	0.0002	0.0001
CNO	mg/L			0.19	< DL	0.22	0.20	0.04	0.09	0.19	0.17	0.08
SCN	mg/L			0.003	0.003	0.006	0.007	0.001	0.003	0.003	0.005	0.002
Sulphate	mg/L			5	5	9	9	4	5	5	8	5
Chloride	mg/L			82	82	113	123	75	72	82	104	72
Total Ammonia	mg/L		0.97	0.05	0.02	0.08	0.08	0.02	0.04	0.05	0.07	0.04
Nitrate	mg/L		2.9	0.2	0.1	0.4	0.4	0.1	0.2	0.2	0.3	0.2
Nitrite	mg/L		0.018	0.027	0.003	0.032	0.031	0.007	0.016	0.027	0.026	0.013
Alkalinity	mg/L			28	28	29	29	28	28	28	29	28
Phosphate-P	mg/L			0.0273	0.0273	0.0315	0.0325	0.0255	0.0277	0.0273	0.0309	0.0273
Org. Carbon	mg/L			7.5	7.5	7.3	7.5	7.5	7.5	7.5	7.5	7.5
Hardness CaCO3	mg/L			47	47	50	50	46	47	47	49	47
Total Metals												
Aluminium Al	mg/L	0.5	0.10	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Antimony Sb	mg/L		0.0031	0.0031	0.0035	0.0035	0.0030	0.0032	0.0031	0.0034	0.0031	
Arsenic As	mg/L		0.005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Barium Ba	mg/L			0.0033	0.0033	0.0035	0.0035	0.0032	0.0033	0.0033	0.0035	0.0033
Cadmium Cd	mg/L		0.000038	0.000004	0.000004	0.000007	0.000007	0.000004	0.000005	0.000004	0.000006	0.000005
Calcium Ca	mg/L	0.3		14	14	24	25	13	15	14	21	14
Chromium Cr	mg/L		0.0010	0.0008	0.0008	0.0010	0.00106	0.0007	0.0008	0.0008	0.0010	0.0008
Cobalt Co	mg/L			0.0011	0.0011	0.0013	0.0014	0.0010	0.0011	0.0011	0.0013	0.0011
Copper Cu	mg/L		0.0020	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Iron Fe	mg/L		0.30	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Lead Pb	mg/L	0.2	0.0020	0.00007	0.00007	0.00008	0.00008	0.00007	0.00007	0.00007	0.00008	0.00007
Lithium Li	mg/L			0.0029	0.0029	0.0029	0.0030	0.0029	0.0029	0.0030	0.0029	0.0029
Magnesium Mg	mg/L			7.3	7.3	7.5	7.4	7.3	7.4	7.3	7.4	7.3
Manganese Mn	mg/L			0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021
Mercury Hg	mg/L		0.00010	0.0000012	0.0000012	0.0000012	0.0000014	0.0000010	0.0000009	0.0000012	0.0000013	0.0000009
Molybdenum Mo	mg/L	0.5	0.073	0.0004	0.0004	0.0007	0.0008	0.0003	0.0004	0.0004	0.0006	0.0004
Nickel Ni	mg/L		0.025	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Potassium K	mg/L			4	4	5	5	3	4	4	5	4
Selenium Se	mg/L		0.001	0.00090	0.00090	0.00089	0.00090	0.00090	0.00090	0.00090	0.00090	0.00090
Silver Ag	mg/L		0.0001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Sodium Na	mg/L	0.5		43	43	58	57	42	43	43	53	43
Thallium Tl	mg/L		0.00080	0.000031	0.000031	0.000031	0.000031	0.000030	0.000031	0.000031	0.000031	0.000031
Tin Sn	mg/L			0.00046	0.00046	0.00054	0.00056	0.00043	0.00046	0.00045	0.00052	0.00045
Zinc Zn	mg/L		0.030	0.004	0.004	0.004	0.004	0.003	0.004	0.004	0.004	0.004

Note: Shaded values exceed CCME guidelines for the protection of Freshwater Aquatic Life

Table 4.3: Summary of Modelled Scenarios to Assess Average Flow Conditions

Scenario	Description	Nutrient Degradation	Flow Conditions	Active Discharge Rate	Maximum Water Level	Year at Maximum Elevation	Year of Thaw	Year Cu<CCME in Tail Lake	Year Spillway Lowered	Doris Creek
1	No Intervention	No	Average	-	33.5 m (FSL)	8	8	35	35	May exceed CCME for NO ₂ for Year 8 and 9
2	No Intervention with nutrient degradation	Base Case	Average	-	33.5 m (FSL)	8	8	35	35	Meets CCME at all times
3	Minimize Management Period	Base Case	Average	1,000,000 from Year 1	29.3	3	4	8	5	May exceed CCME for NO ₂ in years 2 and 3; may be at CCME for Cr*
4	No discharge in Year 1 then minimize management period	Base Case	Average	1,300,000 from Year 2	30.4	2	3	7	5	May Exceed CCME for NO ₂ in Year 2 only; may marginally exceed CCME for Cr*
5	Balance initial discharge and spill effects	Base Case	Average	200,000 from Year 1	33.5 m (FSL)	12	12	34	34	Meets CCME at all times
6	Discharge at 50 % of Scenario 3	Base Case	Average	500,000 from year 1	31.9	20	10	20	20	Meets CCME at all times
7	Effect of wet year on Scenario 1	No	Year 1 at 1:500 year wet	-	33.5 m (FSL)	7	7	34	34	May exceed CCME for NO ₂ in years 7 and 8
8	Effect of wet year on Scenario 3	Base Case	Year 1 at 1:500 year wet	1,000,000 from Year 1	30.1	3	4	9	7	May exceed CCME for NO ₂ in years 2 and 3
9	Effect of wet year on Scenario 6	Base Case	Year 1 at 1:500 year wet	500,000 from year 1	32.3	21	10	21	21	Meets CCME at all times

Note: * May be an artefact of high detection limits used in testing program

4.4.2 Recommendations

As noted, various water management strategies are available that would result in minimal changes of water quality in the receiving environment. For example, all water could be contained in Tail Lake until the FSL is reached. While this strategy would provide ample time to monitor the development of water quality in Tail Lake to verify the predictive modelling results, it would necessitate an extended period of site management. A more appropriate strategy however would be to minimise the onsite presence and operation discharge requirements by maximising discharge volumes. Other benefits for this strategy would include the fact that the FSL of Tail Lake would not be reached, and, as a result the potential effects of permafrost thaw and associated sediment release would be minimised.

It is therefore recommended that a strategy that will minimise the maximum water elevation in Tail Lake and yet be protective of the receiving environment, by meeting CCME guidelines, be adopted. Scenario 3 most closely approximates such a strategy.

The recommended alternative strategy would be to not discharge in Year 1 and then minimise the period of active discharge management by maximising discharge rates. This strategy would provide ample water quality and flow monitoring results in both Tail Lake and in Doris Creek to evaluate rates of changes in water quality over the short-term. These results can then be used to verify the maximum annual discharge rate and to develop battery limits on response times required to changes in flow conditions in Doris Creek to manage discharge rates. Scenario 4 most closely approximates this strategy. As noted before, one of the disadvantages of this strategy is a substantial increase in the maximum operating water level in Tail Lake. This strategy also has an inherently higher risk associated with it. For example, if a 'wet' year is experienced in the first year, followed by a drought conditions in subsequent years, the lower flow conditions in the following years would severely hamper the discharge strategy. In contrast, the preferred strategy (Scenario 3) would be 'in step' with climatic conditions from the start.

The next section presents a series of sensitivity runs that assess potential impacts on the preferred strategy.

4.5 Sensitivity Analysis

Sensitivity runs were completed to assess the effects of a number of conditions and assumptions including:

- Background copper concentrations in Doris Creek
- Low flow conditions
- Nutrient degradation rates
- Sediment loading estimates, and
- Sediment loading control measures (i.e. shoreline protection).

The assumptions adopted for each of the sensitivity runs are summarized in Table 4.4 below. In all cases the sensitivity runs were completed relative to the recommended base case water management strategy (Scenario 3). The results from the sensitivity analyses are provided in Appendix I. In addition to the sensitivity runs shown, the effects of mill upset conditions, as they relate to cyanide treatment, and oxygen demand in Tail Lake water were assessed.

Table 4.4: Summary Assumptions Adopted for Sensitivity Runs

Run ID	Description	Assumptions / Conditions			Nutrient Degradation
		Sediment Load	Erosion Control	Runoff Yield	
CuBG1	Background Copper Concentration				
CuBG2	Copper Conc. Increased by 5 %	Base case	no	180 mm	Base Case
CuBG3	Copper Conc. Increased by 10 %	Base case	no	180 mm	Base Case
	Copper Conc. Increased by 20 %	Base case	no	180 mm	Base Case
	Low Runoff Conditions				
LowFlow1	Scenario 1 - No Control	Base Case	no	111 mm	zero
LowFlow2	Scenario 2 - No Control	Base Case	no	111 mm	Base Case
LowFlow3	Scenario 3	Base Case	no	111 mm	Base Case
	Nutrient Degradation Rates				
Degrad1	Scenario 3	Base case	no	180 mm	None
Degrad2	Scenario 3	Base case	no	180 mm	Enhanced
	Sediment Loadings				
SedLoad1	Scenario 3	Upper Limit	no	180 mm	Base Case
SedLoad2	Scenario 3 - Low Flow	Upper Limit	no	111 mm	Base Case
	Sediment Control				
SedCont1	Cover 20 % of Area to 29.4 m (50 %)	Upper Limit	20%-29.4	180 mm	Base Case
SedCont2	Cover 60 % of Area to 29.4 m (80 %)	Upper Limit	60%-29.4	180 mm	Base Case
SedCont3	Cover 100 % of Area to 29.4 m (90 %)	Upper Limit	100%-29.4	180 mm	Base Case
SedCont4	Cover 100 % of Area to 33.5 m (FSL) (90%)	Upper Limit	100 % FSL	180 mm	Base Case

4.5.1 Background Copper Concentrations in Doris Creek

To assess the effects of changes of copper concentrations in the background water quality (in Doris Creek) on the discharge scenarios, it is necessary to first understand how the discharge volumes estimates were derived. Therefore, in this section, the use of the background water quality and runoff hydrograph to estimate the monthly discharge rates is discussed first. The effects of changes in background water quality are then examined.

As previously discussed in Section 3.2.2, the maximum background copper concentration observed in any month is used as input to the model. It is furthermore important to note that the calculations to determine the maximum possible discharge for any given scenario distributes the discharge flow at a fixed ratio according to the hydrograph in Doris Creek. That is to say, because the maximum background copper concentration is detected in July, the flow determined in that month limits the discharge rates in all the other months. This is more readily explained by example as shown in Table 4.5. The table shows the monthly flows, the flow distribution and the measured background water quality in Doris Creek. For simplicity, in this example the copper concentration in Tail Lake was fixed at 10 µg/L. (In the model the copper concentration varies from month to month due to changes in inflows and discharges.) The maximum possible discharge for each month is determined by calculating the volume of water that could be released to increase the copper concentration in Doris Creek, for the combined creek and discharge flow, to 2 µg/L. The monthly estimated maximum discharge is then compared to the flow in Doris Creek. The lowest ratio represents the maximum allowable monthly ratio that is then adopted and the discharge rates are recalculated to

correspond to this value. In the example given in the table, the lowest ratio (5.9%) occurs for July. The column next to the discharge ratio shows the monthly discharge flows corrected to the Doris Creek hydrograph, i.e. the corrected discharge flows all are equal to 5.9 % of the flow in Doris Creek for the corresponding month. As shown, the corrected discharge for the year of about 986,000 m³ that results from this approach is substantially less than the total maximum possible discharge of about 1,307,000 m³. The last column in the table shows the estimated copper profile downstream of the discharge. As shown, copper concentration would equal the CCME guideline only for the month of July. Concentrations in September and October may also approach the CCME guideline. The net result of this approach is that the period of peak effects in Doris Creek is further constrained; conversely, the total annual discharge volume is underestimated by about 30 %.

Table 4.5: Example Calculation to Illustrate Maximum Discharge Volume Estimations

Month	Doris Creek			Tail Lake Cu Conc. µg/L	Maximum* Discharge possible m ³ /month	Discharge to Doris Ck Flow Ratio (%)	Discharge Corrected to Doris Ck m ³ /month	Copper Conc. in Doris Ck µg/L
	Flow m ³ /month	Distrib.	Cu µg/L					
June	7,200,000	43%	1.20	10	720,000	10.0%	423,000	1.63
July	4,464,000	27%	1.53	10	262,000	5.9%	262,000	2.00
August	1,891,000	11%	1.26	10	174,000	9.2%	111,000	1.69
September	2,400,000	14%	1.50	10	151,000	6.3%	141,000	1.96
October	837,000	5%	1.50	10	53,000	6.3%	49,000	1.96
Total	16,792,000	100%	-	-	1,307,000	-	986,000	-

Note: * Maximum discharge would result in a steady copper concentration of 2 µg/L for each month

On average, as shown by the example, the effect of the discharge calculation is that the maximum increase in total copper concentration in Doris Creek will be 0.47 µg/L, and more often would be less than this value. On this basis, the effects of increased background levels on the maximum copper concentrations in the Doris Creek can be demonstrated for maintaining the discharge rates determined for Scenario 3 (Minimum Management Period, Average Flows) as shown in Table 4.6. The results indicate that a 20 percent increase in the background copper concentration will result in a peak copper concentration in Doris Creek of about 2.23 µg/L. It should be noted that the copper concentration would exceed the CCME guideline in July, September and October, but not in June and August, given the current background water quality profile. Also, the exceedances would occur only over a period of about 3 years as shown in Figure 4.1.

Table 4.6: Effect of Background Increases on Copper Concentrations in Doris Creek

Increase in Background Copper Concentration (%)	Maximum Copper Concentration in Background (µg/L)	Maximum Copper Concentration in Doris Creek (µg/L)
Base Case	1.53	2.00
5	1.61	2.02
10	1.68	2.09
20	1.84	2.23

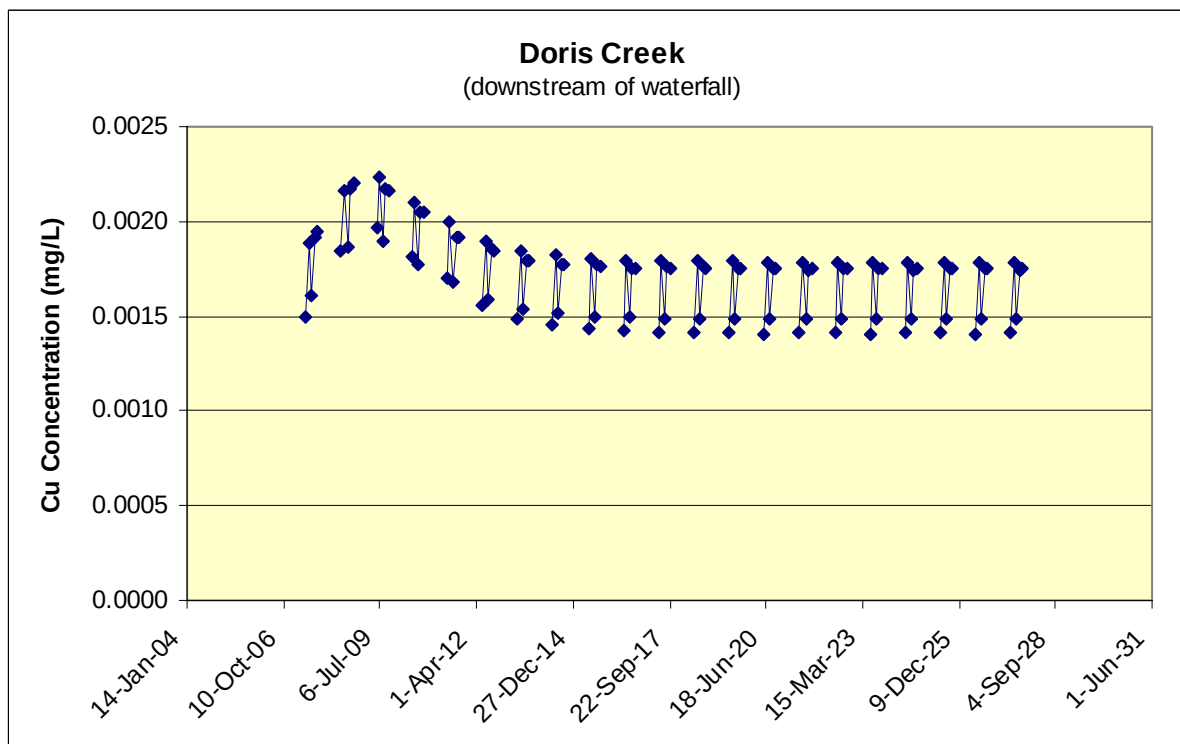


Figure 4.1: Effect of a 20 % Increase in Background Concentrations on Copper Concentrations in Doris Creek Downstream of the Discharge Point (Discharge at 1,000,000 m³/year as for Scenario 3 – Average Flow Conditions)

Conversely, the effect of background copper concentration increases on the allowable discharge rate has been determined and are summarised in Table 4.7. The table also shows the resultant maximum water level in Tail Lake should the increase in background water quality stay in effect indefinitely. The results indicate a decrease in the maximum allowable discharge proportional to the increase in the background copper concentrations in Doris Creek. For example a 10 percent increase in the background copper concentration in Doris Creek would require a reduction of the annual discharge volume from 1,000,000 m³ to about 750,000 m³ to maintain copper concentrations in Doris Creek at or below the CCME guideline. This would cause an increase in the maximum water level to by about 0.6 m to bout 29.9 m. However, as discussed before, the calculation method underestimates the actual allowable discharge volume by about 30 %, and it may be possible to still maintain discharge rates at close to the target annual volume. For a 10 % increase in the background concentration the operational discharge period could be extended to about 12 years with the given discharge rate of 750,000 m³ per year.

Table 4.7: Effect of Background Copper Increases on Maximum Discharge Rates to CCME in Doris Creek

Increase in Background Copper Concentration (%)	Maximum Copper Concentration in Background (µg/L)	Maximum Discharge Rate to meet CCME for Cu in Doris Creek (m ³ /year)	Max. Elevation in Tail Lake (m)	Year of Maximum Water Level	Year when Cu < CCME in Tail Lake	Year when Spillway can be lowered to Original Lake Elevation
Base Case	1.53	1,000,000	29.3	3	8	5
5	1.61	900,000	29.5	3	9	6
10	1.68	750,000	29.9	3	13	12
20	1.84	400,000	33.5	25	25	25

4.5.2 Low Flow Conditions

The results from the sensitivity runs completed to assess effects of low flows on the potential discharge strategies are provided in Appendix I and are summarised in Table 4.8 and Table 4.9. As before, these tables summarise the maximum concentrations predicted respectively in Tail Lake and Doris Creek. Table 4.10 provides a summary of all the low flow scenarios modelled.

As would be expected, the time to discharge is significantly longer for the scenarios where Tail Lake is allowed to fill to the FSL. The time to discharge would increase from about 8 years to about 13 years.

The results further indicate that low flow conditions (111 mm yield) would result in a marginal increase in the estimated maximum concentrations for all solutes in Tail Lake for Scenarios 1 and 2. However, since the dilution within Tail Lake does not change between the low and base flow conditions, the outcome after Tail Lake overflows is the same irrespective of the flow conditions.

For Scenario 3, however, the lower flows in Doris Creek, at the low yield, prevent discharging at the elevated discharge rate possible for the base case. Rather, the maximum possible discharge is only 550,000 m³ per year. At this lower discharge rate, adjusted to suit the low flow conditions, it is possible to continue to meet CCME guidelines in Doris Creek. As for the base flow conditions, the volume in Tail Lake will be drawn down to the original lake level before the FSL is reached. The period of active discharge, however, would be extended by about 1 year.

It is apparent from these results that the discharge strategies can be tailored to actual site conditions to still meet CCME guidelines in Doris Creek.

Table 4.8: Summary of Estimated Maximum Concentrations in Tail Lake for Low Flow Conditions (111 mm/year Yield)

Tail Lake Parameter	units	MMER Criteria	CCME Guidelines	Base Case (180 mm)			Low Flow Conditions (111 mm)		
				1	2	3	1a	2a	3a
Year of Occurrence				Year 2	Year 2	Year 2	Year 2	Year 2	Year 2
pH			6 to 9	7 to 8	7 to 8	7 to 8	7 to 8	7 to 8	7 to 8
TDS	mg/L			652	652	1583	736	736	1427
TSS	mg/L	15		4.8	4.8	3.7	4.7	4.7	5.1
Free CN	mg/L	1	0.0050	0.0060	0.0025	0.0036	0.0067	0.0028	0.0033
Total CN	mg/L			0.059	0.025	0.035	0.066	0.027	0.032
WAD CN	mg/L			0.0080	0.0034	0.0048	0.0090	0.0037	0.0044
CNO	mg/L			6.6	2.8	4.0	7.4	3.0	3.7
SCN	mg/L			0.090	0.090	0.118	0.101	0.101	0.119
Sulphate	mg/L			83	83	109	93	93	109
Chloride	mg/L			422	422	1051	484	484	968
Total Ammonia	mg/L		0.97	0.99	1.01	1.31	1.12	1.09	1.26
Nitrate	mg/L		2.9	5.4	5.2	6.8	6.1	6.0	7.0
Nitrite	mg/L		0.02	0.73	0.39	0.53	0.85	0.42	0.49
Alkalinity	mg/L			52	52	64	55	55	62
Phosphate-P	mg/L			0.1537	0.1537	0.2183	0.1782	0.1782	0.2195
Org. Carbon	mg/L			6.4	6.4	4.8	5.7	5.7	5.4
Hardness CaCO3	mg/L			100	100	127	108	108	124
Total Metals							0	0	0
Aluminium Al	mg/L		0.10	0.15	0.15	0.14	0.16	0.16	0.22
Antimony Sb	mg/L			0.0138	0.0138	0.0194	0.0160	0.0160	0.0197
Arsenic As	mg/L	0.5	0.005	0.00	0.00	0.00	0.00	0.00	0.00
Barium Ba	mg/L			0.0097	0.0097	0.0125	0.0107	0.0107	0.0124
Cadmium Cd	mg/L		0.000038	0.000051	0.000051	0.000066	0.000057	0.000057	0.000066
Calcium Ca	mg/L			225	225	295	252	252	296
Chromium Cr	mg/L		0.0010	0.0060	0.0060	0.0078	0.0067	0.0067	0.0078
Cobalt Co	mg/L			0.0094	0.0094	0.0123	0.0106	0.0106	0.0124
Copper Cu	mg/L	0.3	0.0020	0.009	0.009	0.011	0.010	0.010	0.011
Iron Fe	mg/L		0.30	0.17	0.17	0.15	0.18	0.18	0.24
Lead Pb	mg/L	0.2	0.0020	0.00038	0.00038	0.00047	0.00042	0.00042	0.00049
Lithium Li	mg/L			0.0054	0.0054	0.0055	0.0056	0.0056	0.0059
Magnesium Mg	mg/L			8.8	8.8	10.6	9.2	9.2	10.3
Manganese Mn	mg/L			0.026	0.026	0.034	0.029	0.029	0.034
Mercury Hg	mg/L		0.00010	0.0000116	0.0000116	0.0000107	0.0000133	0.0000133	0.0000178
Molybdenum Mo	mg/L		0.073	0.0081	0.0081	0.0107	0.0092	0.0092	0.0107
Nickel Ni	mg/L	0.5	0.025	0.008	0.008	0.010	0.008	0.008	0.010
Potassium K	mg/L			37	37	49	42	42	49
Selenium Se	mg/L		0.0010	0.00096	0.00096	0.00081	0.00100	0.00100	0.00121
Silver Ag	mg/L		0.00010	0.00011	0.00011	0.00013	0.00012	0.00012	0.00013
Sodium Na	mg/L			117	117	386	132	132	301
Thallium Tl	mg/L		0.00080	0.000041	0.000041	0.000048	0.000042	0.000042	0.000046
Tin Sn	mg/L			0.00209	0.00209	0.00296	0.00241	0.00241	0.00297
Zinc Zn	mg/L	0.5	0.030	0.021	0.021	0.027	0.023	0.023	0.027

Note: Shaded values above CCME guidelines

Table 4.9: Summary of Estimated Maximum Concentrations in Doris Creek for Low Flow Conditions (111 mm/year Yield)

Doris Creek Parameter	Units	MMER Criteria	CCME Guidelines	Base Case			Low Flow Conditions		
				1	2	3	1a	2a	3a
Year of Occurrence				Year 9	Year 9	Year 2	Year 15	Year 15	Year 3
pH			6 to 9	7 to 8	7 to 8	7 to 8	7 to 8	7 to 8	7 to 8
TDS	mg/L			172	172	216	183	183	203
TSS	mg/L			7.0	7.0	6.8	7.0	7.0	6.9
Free CN	mg/L	1	0.0050	0.0002	0.0000	0.0002	0.0002	0.0000	0.0002
Total CN	mg/L			0.004	0.002	0.004	0.004	0.002	0.004
WAD CN	mg/L			0.0002	< DL	0.0003	0.0003	< DL	0.0002
CNO	mg/L			0.19	0.00	0.22	0.27	0.00	0.19
SCN	mg/L			0.003	0.003	0.006	0.004	0.004	0.006
Sulphate	mg/L			5	5	9	6	6	8
Chloride	mg/L			82	82	113	91	91	105
Total Ammonia	mg/L		0.97	0.05	0.02	0.08	0.06	0.02	0.08
Nitrate	mg/L		2.9	0.2	0.1	0.4	0.3	0.1	0.4
Nitrite	mg/L		0.018	0.027	0.003	0.032	0.038	0.003	0.028
Alkalinity	mg/L			28	28	29	28	28	29
Phosphate-P	mg/L			0.0273	0.0273	0.0315	0.0260	0.0260	0.0324
Org. Carbon	mg/L			7.5	7.5	7.3	7.5	7.5	7.4
Hardness CaCO3	mg/L			47	47	50	47	47	49
							0	0	0
Aluminium Al	mg/L	0.5	0.10	0.08	0.08	0.08	0.08	0.08	0.09
Antimony Sb	mg/L			0.0031	0.0031	0.0035	0.0029	0.0029	0.0036
Arsenic As	mg/L		0.005	0.00	0.00	0.00	0.00	0.00	0.00
Barium Ba	mg/L			0.0033	0.0033	0.0035	0.0033	0.0033	0.0036
Cadmium Cd	mg/L		0.000038	0.000004	0.000004	0.000007	0.000005	0.000005	0.000007
Calcium Ca	mg/L	0.3		14	14	24	17	17	23
Chromium Cr	mg/L		0.0010	0.0008	0.0008	0.0010	0.00078	0.0008	0.0010
Cobalt Co	mg/L			0.0011	0.0011	0.0013	0.0009	0.0009	0.0014
Copper Cu	mg/L		0.0020	0.002	0.002	0.002	0.002	0.002	0.002
Iron Fe	mg/L		0.30	0.13	0.13	0.13	0.13	0.13	0.13
Lead Pb	mg/L	0.2	0.0020	0.00007	0.00007	0.00008	0.00007	0.00007	0.00009
Lithium Li	mg/L			0.0029	0.0029	0.0029	0.0030	0.0030	0.0030
Magnesium Mg	mg/L			7.3	7.3	7.5	7.4	7.4	7.4
Manganese Mn	mg/L			0.021	0.021	0.021	0.021	0.021	0.021
Mercury Hg	mg/L		0.00010	0.0000012	0.0000012	0.0000012	0.0000016	0.0000016	0.0000015
Molybdenum Mo	mg/L	0.5	0.073	0.0004	0.0004	0.0007	0.0005	0.0005	0.0007
Nickel Ni	mg/L		0.025	0.001	0.001	0.001	0.001	0.001	0.001
Potassium K	mg/L			4	4	5	4	4	5
Selenium Se	mg/L		0.001	0.00090	0.00090	0.00089	0.00090	0.00090	0.00091
Silver Ag	mg/L		0.0001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Sodium Na	mg/L	0.5		43	43	58	43	43	52
Thallium Tl	mg/L		0.00080	0.000031	0.000031	0.000031	0.000031	0.000031	0.000031
Tin Sn	mg/L			0.00046	0.00046	0.00054	0.00048	0.00048	0.00053
Zinc Zn	mg/L		0.030	0.004	0.004	0.004	0.004	0.004	0.004

Note: Shaded values above CCME guidelines

Table 4.10: Summary of Modelled Scenarios for Low Flow Conditions

Scenario	Description	Nutrient Degradation	Flow Conditions	Active Discharge Rate	Maximum Water Level	Year at Maximum Elevation	Year of Thaw	Year Cu < CCME in Tail Lake	Year Spill Way Lowered	Doris Creek
1	No Intervention	None	180	-	33.5 m (FSL)	8	8	35	35	May exceed CCME for NO ₂ for Year 8 and 9 (unlikely)
2	No Intervention with nutrient degradation	Base Case	180	-	33.5 m (FSL)	8	8	35	35	Meets CCME at all times
3	Minimize Management Period	Base Case	180	1,000,000 from Year 1	29.3	3	4	8	5	May exceed CCME for NO ₂ in years 2 and 3
1a	No Intervention	None	111	-	33.5 (FSL)	13	10	41	41	May exceed CCME for NO ₂ for Year 13 and 14 (highly unlikely)
2a	No Intervention with nutrient degradation	Base Case	111	-	33.5 (FSL)	13	10	41	41	Meets CCME at all times
3a	Minimize Management Period	Base Case	111	550,000 from year 1	29.8	3	4	14	9	May exceed CCME for NO ₂ in years 2 and 3

4.5.3 Nutrient Degradation Rates

The effect of cyanide compound and nutrient degradation rates on nutrient concentrations in Tail Lake and in Doris Creek were assessed for the preferred discharge strategy (Scenario 3), at base case conditions, to assess the effects of no degradation and enhanced degradation rates. The results for Tail Lake are illustrated in Figure 4.2. The corresponding results for Doris Creek are shown in Figure 4.3. Table 4.11 provides a summary of the estimated maximum concentrations.

The results for Tail Lake indicate that degradation rates mainly affect the cyanate and nitrate concentrations. The highest cyanate concentrations would result in the absence of any degradation, whereas the base case estimates result in the highest nitrate concentration. Maximum ammonia-N concentration estimates are similar irrespective of the degradation rate.

The results further indicate that degradation rates have little effect on nutrient concentrations in Doris Creek. In all cases, CCME guidelines would be met except for nitrite. As discussed before, rate of nitrite oxidation in Doris Creek has not been included in the calculations.

Table 4.11: Summary of Estimated Effects of Degradation Rates on Nutrient Concentrations (Maximum Concentrations)

Parameter	Units	MMER	CCME	Tail Lake			Doris Creek		
				Base Case	None	Enhanced	Base Case	None	Enhanced
				Year 2	Year 2	Year 2	Year 3	Year 3	Year 3
Free CN	mg/L	1.0	0.005	0.0036	0.0079	0.0036	0.00020	0.00043	0.00020
Total CN	mg/L			0.035	0.077	0.035	0.0038	0.0061	0.0038
WAD CN	mg/L			0.0048	0.0105	0.0048	0.0003	0.0006	0.0003
CNO	mg/L			4.0	8.7	4.0	0.22	0.47	0.22
SCN	mg/L			0.118	0.118	0.118	0.006	0.006	0.006
Total Ammonia	mg/L		0.97	1.31	1.27	1.31	0.084	0.078	0.084
Nitrate	mg/L		2.9	6.8	7.0	3.6	0.39	0.41	0.20
Nitrite	mg/L		0.018	0.53	0.95	0.40	0.032	0.055	0.025

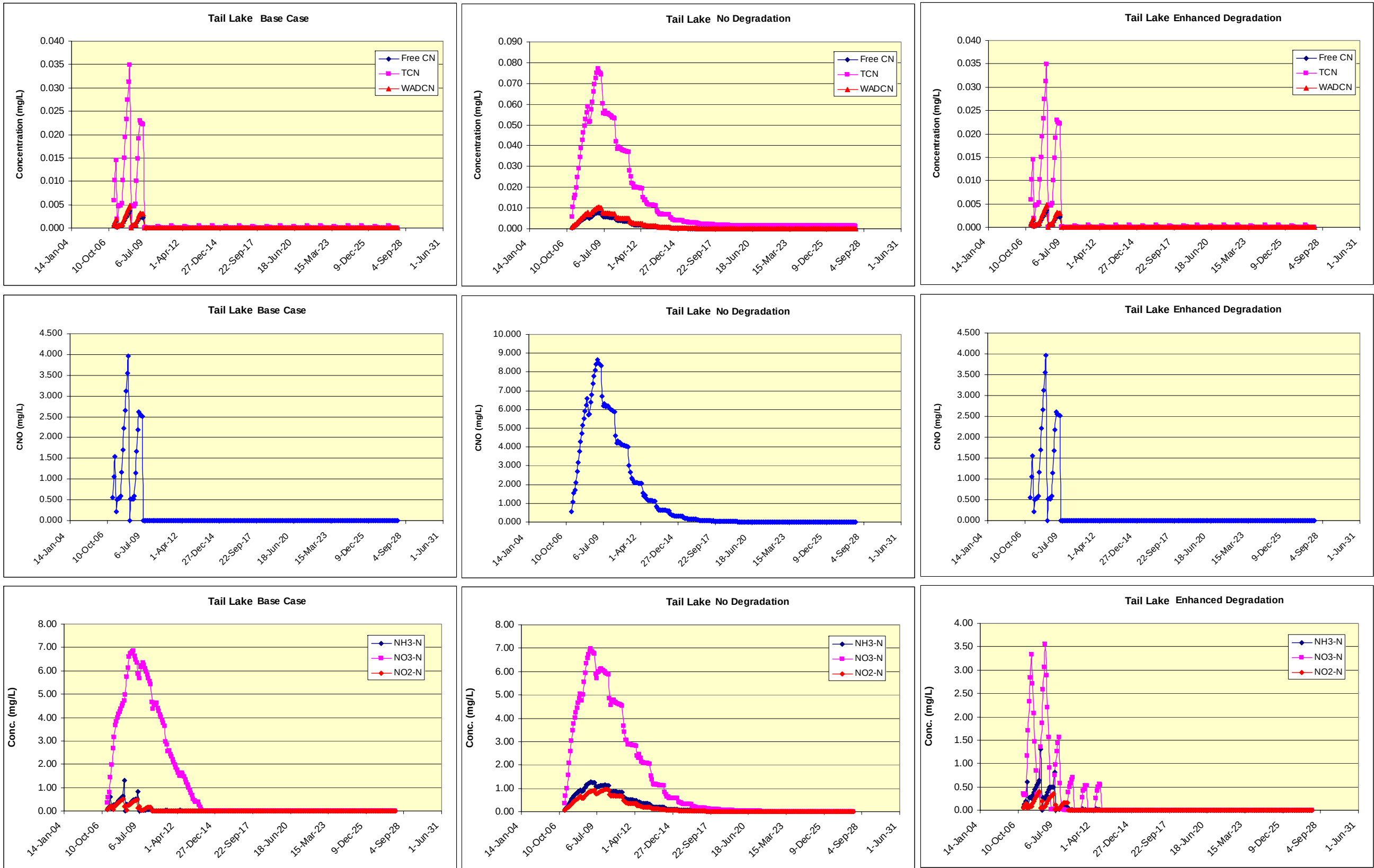


Figure 4.2: Effect of Degradation Rates on Nutrient Concentrations in Tail Lake

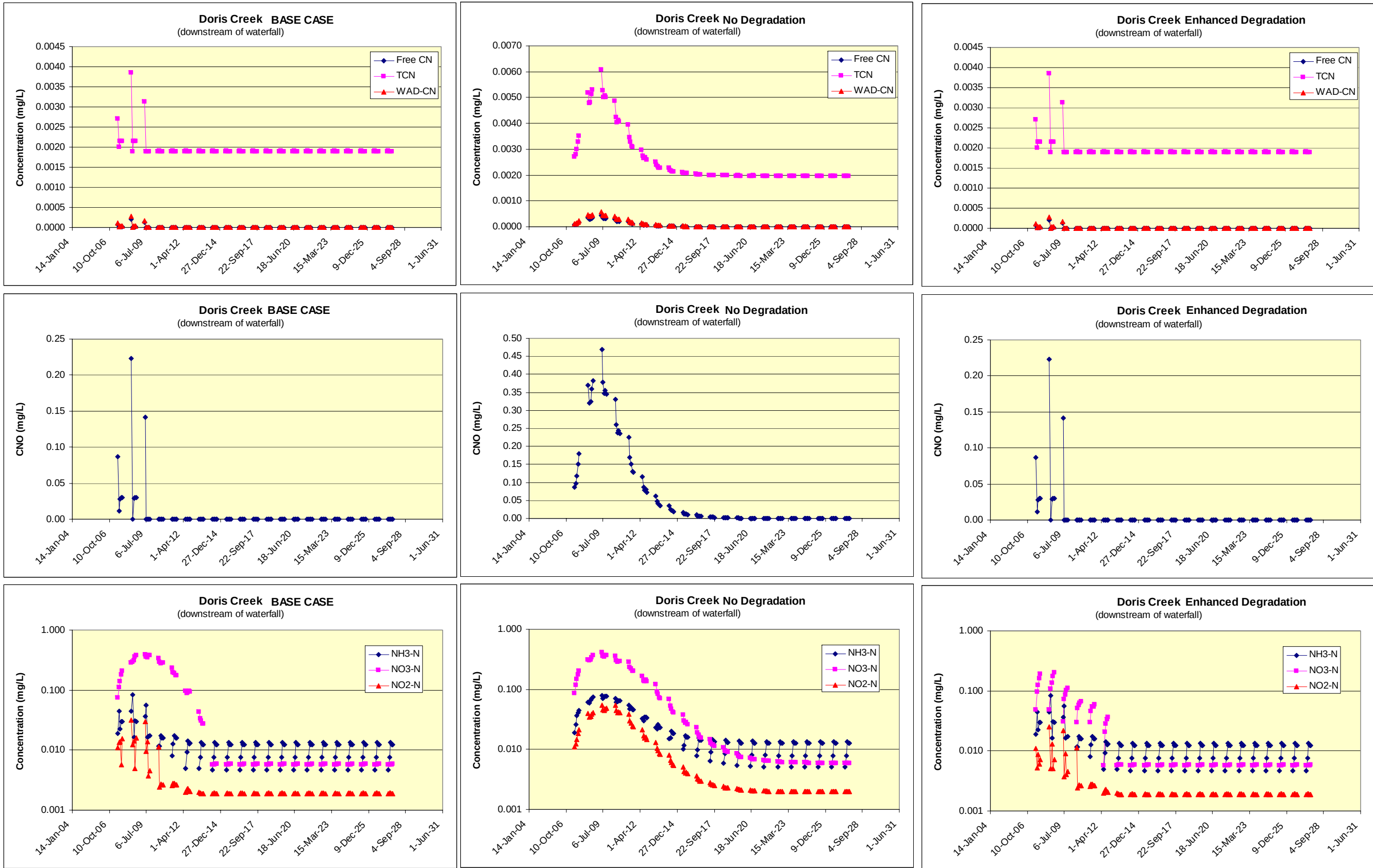


Figure 4.3: Effect of Degradation Rates on Nutrient Concentrations in Doris Creek

4.5.4 Sediment Loadings

The effects of sediment loadings that may result from erosion and re-suspension, without any control measures, are summarised in Table 4.12. Time series plots for select parameters are provided in Appendix I as before.

As shown in the table, total suspended concentrations in Tail Lake are predicted to increase to about 5.8 mg/L for the base case at the upper limit of solids loadings, and to about 8.5 mg/L for low flow conditions. These peak concentrations are predicted to occur in about 9 to 10 years from commencement of operations, or about 5 years from when the erosion first begins. The calculations assume that the sediment loadings will remain constant indefinitely after inception.

In addition to total suspended solids concentrations, the increased sediment loadings most significantly contribute to aluminium, iron, mercury and selenium concentrations in Tail Lake. It is important to note that the sediment loadings do not contribute significantly to the cadmium, chromium, copper and silver concentrations in Tail Lake, and that the peak concentrations relate to the short term operational conditions only. (Time series plots are provided for key parameters in Appendix I.)

Assuming that sediment loadings persist at the estimated upper limit indefinitely, then CCME guidelines for aluminium, iron and selenium would be exceeded in Tail Lake in the longer term. (In the base case (Scenario 3) only aluminium could exceed CCME guidelines.) However, for the base case flow conditions (i.e. yield of 18 mm) none of these parameters would exceed CCME in Doris Creek downstream of the waterfall. For the low flow conditions (i.e. yield of 111 mm) only aluminium is predicted to marginally (by about 2 %) exceed CCME guidelines in Doris Creek sporadically. Chromium would be at about its CCME guideline, however, as noted before, elevated detection limits used in the testing program likely are causing overestimation of chromium concentrations. The increased sediment loadings have negligible effect on the estimated chromium concentrations.

It should be noted that the annual sediment loading in Tail Lake ranges between 1,071,255 and 7,601,115 kg/year (Table 3.7). Assuming this load spreads out and settles evenly over the entire surface area of Tail Lake at the steady state flow-through elevation of 28.3 m (i.e. 76.6 ha), this would result in a sediment build-up of between 1.1 and 7.5 mm/year (based on soil settling test results: assume average soil solids content of 39.3% (wt); soil specific gravity of 2.65; average settled solids density of 1,324 kg/m³). If the assumption is made that the sediments will only settle out on the tailings surface (i.e. a surface area of 19.1 ha based on the final tailings elevation of 24.3 m), the annual build-up of sediments is between 4.2 and 30.1 mm/year. These numbers are small enough that any sediment-build-up does not need to be accounted for in the model. During the annual bathymetry surveys, core samples will be collected such that the sediment loading can be monitored.

The results suggest that while the water quality in Tail Lake may deteriorate from sediment loadings at the estimated upper limit, water quality in Doris Creek is likely to be maintained within CCME guidelines by the proposed water management strategy, without the need for additional erosion control measures. Erosion control measures may however improve the water quality in Tail Lake. The effect of erosion controls on water quality in Tail Lake is examined in the next section.

4.5.5 Sediment Loading Control Measures

The results for the sensitivity runs completed on the erosion control measures are summarised in Table 4.13 for Tail Lake, and in Table 4.14 for Doris Creek. All of the sensitivity runs were completed for the upper limit sediment load estimates. As noted earlier in Table 4.4, four cases were evaluated, ranging from covering 20 % of the area identified as potentially susceptible to erosion, to 100 % coverage to the FSL.

Table 4.12: Summary of Upper Limit Sediment Loading Effects on Tail Lake and Doris Creek Water Quality

Parameter	Units	MMER Criteria	CCME Guidelines	Tail Lake			Doris Creek		
				Scenario 3	SedLoad1	SedLoad2	Scenario 3	SedLoad1	SedLoad2
Sediment Load				Base case	Upper Limit	Upper Limit	Base case	Upper Limit	Upper Limit
Flow Yield	mm			180	180	111	180	180	111
Discharge	m3/year			1,000,000	1,000,000	550,000	1,000,000	1,000,000	550,000
Year of Peak				Year 2 / 9*	Year 2 / 9*	Year 2 / 10*	Year 2 / 9*	Year 2 / 9*	Year 2 / 10*
pH			6 to 9	7 to 8	7 to 8	7 to 8	7 to 8	7 to 8	7 to 8
TDS	mg/L	15		1583	1583	1427	216	216	203
TSS	mg/L			3.7	5.8	8.5	6.8	6.9	7.1
Sulphate	mg/L			109	109	109	9	9	8
Chloride	mg/L			1051	1075	987	113	114	106
Total Ammonia	mg/L		0.97	1.31	1.31	1.26	0.08	0.08	0.08
Nitrate	mg/L		2.9	6.8	6.8	7.0	0.4	0.4	0.4
Nitrite	mg/L		0.02	0.53	0.53	0.49	0.03	0.03	0.03
Alkalinity	mg/L			64	64	62	29	29	29
Phosphate-P	mg/L			0.22	0.22	0.22	0.03	0.03	0.03
Org. Carbon	mg/L			4.8	4.8	5.4	7.3	7.3	7.4
Hardness CaCO3	mg/L			127	127	124	50	50	49
Total Metals									
Aluminium Al	mg/L		0.10	0.14	0.32	0.54	0.083	0.093	0.102
Antimony Sb	mg/L	0.5	0.005	0.0194	0.0194	0.0197	0.0035	0.0035	0.0036
Arsenic As	mg/L			0.0033	0.0033	0.0033	0.0006	0.0006	0.0006
Barium Ba	mg/L			0.0125	0.0125	0.0124	0.0035	0.0035	0.0036
Cadmium Cd	mg/L		0.000038	0.000066	0.000066	0.000066	0.000007	0.000007	0.000007
Calcium Ca	mg/L			295	295	296	24	24	23
Chromium Cr	mg/L		0.0010	0.0078	0.0078	0.0078	0.0010	0.0010	0.0010
Cobalt Co	mg/L			0.0123	0.0123	0.0124	0.0013	0.0013	0.0014
Copper Cu	mg/L	0.3	0.0020	0.011	0.011	0.011	0.002	0.002	0.002
Iron Fe	mg/L		0.30	0.15	0.33	0.54	0.13	0.14	0.14
Lead Pb	mg/L	0.2	0.0020	0.00047	0.00047	0.00049	0.00008	0.00008	0.00009
Lithium Li	mg/L			0.0055	0.0060	0.0084	0.0029	0.0030	0.0031
Magnesium Mg	mg/L			10.6	10.6	12.5	7.5	7.5	7.5
Manganese Mn	mg/L			0.034	0.034	0.034	0.021	0.021	0.021
Mercury Hg	mg/L		0.00010	0.000011	0.000025	0.000042	0.0000012	0.0000020	0.0000027
Molybdenum Mo	mg/L		0.073	0.0107	0.0107	0.0107	0.0007	0.0007	0.0007
Nickel Ni	mg/L	0.5	0.025	0.010	0.010	0.010	0.001	0.001	0.001
Potassium K	mg/L			49	49	49	5	5	5
Selenium Se	mg/L		0.0010	0.00081	0.0015	0.0024	0.00089	0.00092	0.00096
Silver Ag	mg/L		0.00010	0.00013	0.00013	0.00014	0.00001	0.00001	0.00001
Sodium Na	mg/L			386	401	312	58	58	53
Thallium Tl	mg/L		0.00080	0.000048	0.000048	0.000047	0.000031	0.000031	0.000031
Tin Sn	mg/L			0.00296	0.00296	0.00297	0.00054	0.00054	0.00053
Zinc Zn	mg/L	0.5	0.030	0.027	0.027	0.027	0.004	0.004	0.004

Note: * Operationally related parameters peak early whereas erosion related parameters peak later on.

Table 4.13: Summary of Erosion Control Measures on Water Quality in Tail Lake

Parameter	Units	MMER Criteria	CCME Guidelines	Base Case Scenarios		Sensitivity Runs			
				Scenario 3	SedLoad1	SedCont1	SedCont2	SedCont3	SedCont4
Sediment Loading				Base Case	Upper Limit	Upper Limit	Upper Limit	Upper Limit	Upper Limit
Measure				none	none	20 % to 29.4 m	60 % to 29.4 m	100 % to 29.4 m	100 % to FSL
Efficiency	%			-	-	50	80	90	90
TDS	mg/L	15		1583	1583	1583	1583	1583	1583
TSS	mg/L			3.7	5.8	3.3	3.1	3.1	3.1
Sulphate	mg/L			109	109	109	109	109	110
Chloride	mg/L			1051	1075	1043	1038	1036	1036
Total Ammonia	mg/L		0.97	1.31	1.31	1.31	1.32	1.33	1.38
Nitrate	mg/L		2.9	6.8	6.8	6.9	7.2	7.4	9.3
Nitrite	mg/L		0.02	0.526	0.526	0.526	0.526	0.526	0.527
Alkalinity	mg/L			64	64	64	64	64	64
Phosphate-P	mg/L			0.22	0.22	0.22	0.22	0.22	0.22
Org. Carbon	mg/L			4.8	4.8	4.8	4.8	4.8	4.8
Hardness CaCO3	mg/L			127	127	127	127	127	127
Total Metals									
Aluminium Al	mg/L	0.5	0.10	0.14	0.32	0.086	0.064	0.063	0.088
Antimony Sb	mg/L			0.0194	0.0194	0.0194	0.0194	0.0194	0.0195
Arsenic As	mg/L		0.005	0.0033	0.0033	0.0033	0.0033	0.0034	0.0037
Barium Ba	mg/L			0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Cadmium Cd	mg/L		0.000038	0.000066	0.000066	0.000067	0.000069	0.000072	0.000087
Calcium Ca	mg/L	0.3		295	295	295	295	295	296
Chromium Cr	mg/L		0.0010	0.0078	0.0078	0.0078	0.0078	0.0078	0.0079
Cobalt Co	mg/L			0.0123	0.0123	0.0123	0.0123	0.0123	0.0124
Copper Cu	mg/L		0.0020	0.011	0.011	0.011	0.011	0.011	0.011
Iron Fe	mg/L		0.30	0.15	0.33	0.09	0.07	0.06	0.07
Lead Pb	mg/L	0.2	0.0020	0.00047	0.00047	0.00047	0.00048	0.00049	0.00057
Lithium Li	mg/L			0.0055	0.0060	0.0055	0.0055	0.0055	0.0055
Magnesium Mg	mg/L			10.6	10.6	10.6	10.7	10.7	10.7
Manganese Mn	mg/L			0.034	0.034	0.034	0.034	0.034	0.034
Mercury Hg	mg/L		0.00010	0.0000107	0.000025	0.0000069	0.0000070	0.0000072	0.0000085
Molybdenum Mo	mg/L	0.5	0.073	0.0107	0.0107	0.0107	0.0107	0.0107	0.0107
Nickel Ni	mg/L		0.025	0.010	0.010	0.010	0.010	0.010	0.010
Phosphorus P	mg/L			0.305	0.305	0.306	0.308	0.309	0.323
Potassium K	mg/L			49	49	49	49	49	49
Selenium Se	mg/L		0.0010	0.00081	0.0015	0.00062	0.00056	0.00055	0.00067
Silver Ag	mg/L		0.00010	0.00013	0.00013	0.00013	0.00013	0.00014	0.00017
Strontium Sr	mg/L			0.104	0.104	0.104	0.104	0.104	0.104
Thallium Tl	mg/L		0.00080	0.000048	0.000048	0.000048	0.000049	0.000050	0.000058
Tin Sn	mg/L			0.00296	0.00296	0.00297	0.00298	0.00299	0.00308
Zinc Zn	mg/L		0.030	0.027	0.027	0.027	0.027	0.027	0.028

Note: Shaded values above CCME guidelines for the protection of Freshwater Aquatic Life

Table 4.14: Summary of Erosion Control Measure Effects on Water Quality in Doris Creek

Parameter	units	MMER Criteria	CCME Guidelines	Base Case Scenarios		Sensitivity Runs			
				Scenario 3	SedLoad1	SedCont1	SedCont2	SedCont3	SedCont4
Sediment Loading				Base Case	Upper Limit	Upper Limit	Upper Limit	Upper Limit	Upper Limit
Measure				none	none	20 % 29.4 m	60 % 29.4 m	100 % 29.4 m	100 % FSL
Efficiency	%			-	-	50	80	90	90
TDS	mg/L			216	216	216	216	216	216
TSS	mg/L			6.8	6.9	6.8	6.8	6.8	6.8
Sulphate	mg/L			9	9	9	9	9	9
Chloride	mg/L			113	114	113	112	112	112
Total Ammonia	mg/L		0.97	0.08	0.08	0.08	0.09	0.09	0.09
Nitrate	mg/L		2.9	0.4	0.4	0.4	0.4	0.4	0.5
Nitrite	mg/L		0.018	0.032	0.032	0.032	0.032	0.032	0.032
Alkalinity	mg/L			29	29	29	29	29	29
Phosphate-P	mg/L			0.032	0.032	0.031	0.031	0.031	0.031
Org. Carbon	mg/L			7.3	7.3	7.3	7.3	7.3	7.3
Hardness CaCO3	mg/L			50	50	50	50	50	50
Total Metals									
Aluminium Al	mg/L		0.10	0.08	0.09	0.08	0.08	0.08	0.08
Antimony Sb	mg/L			0.0035	0.0035	0.0035	0.0035	0.0035	0.0035
Arsenic As	mg/L	0.5	0.005	0.00	0.00	0.00	0.0035	0.00	0.00
Barium Ba	mg/L			0.0035	0.0035	0.0035	0.0035	0.0035	0.0035
Cadmium Cd	mg/L		0.000038	0.000007	0.000007	0.000007	0.000007	0.000007	0.000008
Calcium Ca	mg/L			24	24	24	24	24	24
Chromium Cr	mg/L		0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
Cobalt Co	mg/L			0.0013	0.0013	0.0013	0.0014	0.0014	0.0014
Copper Cu	mg/L	0.3	0.0020	0.002	0.002	0.002	0.002	0.002	0.002
Iron Fe	mg/L		0.30	0.13	0.14	0.12	0.12	0.12	0.12
Lead Pb	mg/L	0.2	0.0020	0.00008	0.00008	0.00008	0.00008	0.00008	0.00009
Lithium Li	mg/L			0.0029	0.0030	0.0029	0.0029	0.0029	0.0029
Magnesium Mg	mg/L			7.5	7.5	7.5	7.5	7.5	7.5
Manganese Mn	mg/L			0.021	0.021	0.021	0.021	0.021	0.021
Mercury Hg	mg/L		0.00010	0.0000012	0.0000020	0.0000010	0.0000010	0.0000010	0.0000011
Molybdenum Mo	mg/L		0.073	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007
Nickel Ni	mg/L	0.5	0.025	0.001	0.001	0.001	0.001	0.001	0.001
Phosphorus P	mg/L			0.036	0.036	0.036	0.036	0.036	0.037
Potassium K	mg/L			5	5	5	5	5	5
Selenium Se	mg/L		0.001	0.00089	0.00092	0.00088	0.00088	0.00088	0.00089
Silver Ag	mg/L		0.0001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Sodium Na	mg/L			58	58	57	57	57	57
Thallium Tl	mg/L		0.00080	0.000031	0.000031	0.000031	0.000031	0.000031	0.000032
Tin Sn	mg/L			0.00054	0.00054	0.00054	0.00055	0.00055	0.00055
Zinc Zn	mg/L	0.5	0.030	0.004	0.004	0.004	0.004	0.004	0.004

Note: Shaded values above CCME guidelines for the protection of Freshwater Aquatic Life

In the first case, areas of highest risk would be identified and covered. For this case it assumed the sediment loadings could be reduced by 50 %. This is not unreasonable since most erosion would occur in narrow gulleys and channels that would make up only a small proportion of the area. If these can be identified and controlled then the overall sediment loading would be substantially reduced. By the same reasoning, it was assumed that 60 % coverage should provide 80 % control. An efficiency of 90 % was conservatively assigned to the 100 % coverage options.

As shown, the sediment control measures will improve water quality in Tail Lake with respect to the key parameters, aluminium, selenium and iron, as identified in the preceding section. In particular, an efficiency of 50 % would lower the aluminium concentration to below the CCME guideline in Tail Lake, and provide long term protection of water quality in Doris Creek.

The higher coverage options demand increasingly higher volumes of quarried rock, which also contribute to solute concentrations in Tail Lake. In particular, nutrient concentrations in Tail Lake are shown to increase, with nitrate increasing from about 6.8 mg/L for the base case to a maximum concentration of about 9.3 mg/L. Ammonia concentrations increase marginally from 1.31 mg/L to 1.38 mg/L. These releases however occur in the short term only and decrease in time as the blast residues are washed from the quarried rock.

Other parameters that will increase in the longer term (mainly for the 100 % coverage to FSL case) include arsenic, cadmium, lead, silver and thallium, however, none of these increases significantly affect concentrations in Doris Creek, as shown in Table 4.14.

4.5.6 Tailings Treatment Upsets

Cyanide treatment systems generally are designed with sophisticated control and shutdown systems that will limit or prevent upset conditions. Rather than speculating on the possible range of upset conditions that may occur, modelling runs were completed to assess the range of upset conditions that could occur for the base case without significantly affecting water quality in the receiving environment. The calculations considered zero cyanide removal as the worst case upset condition that may occur. For these conditions, the free and total cyanide concentrations in the discharge were calculated from the flotation and untreated cyanide leachate volume ratio, and the respective concentrations. These were input to the model and the proportion of time determined for which these conditions could be tolerated without causing an exceedance in Doris Creek. The rate of cyanide degradation while the water is contained in Tail Lake will also impact on the resultant water quality. Therefore the calculations were completed for the no degradation and base case degradation rates.

The results are summarised in Table 4.15. As shown, to maintain the free cyanide concentration below the CCME guideline, the treatment plant needs to be 97.5 percent efficient. Conversely, the plant could fail for 9 days of the year while operating at 100 percent for the remainder of the time, and the free cyanide concentration should remain at or below the CCME guideline.

In consideration of degradation reactions in Tail Lake, the treatment efficiency can decrease to about 95 percent without causing a CCME guideline exceedance in Doris Creek. The proposed treatment system relies on well defined chemical reactions that can readily be manipulated through reagent control. Therefore, it is expected that these levels of efficiencies should readily be achievable.

Table 4.15: Summary of Estimated Cyanide Treatment efficiency Requirements

Degradation	Efficiency	Equivalent Days	Tail Lake		Doris Creek	
			CN(Free) (mg/L)	CN(T) (mg/L)	CN(Free) (mg/L)	CN(T) (mg/L)
Base Case	100%	0	0.0036	0.035	0.00020	0.004
None	97.5%	9.1	0.0925	0.163	0.00500	0.011
Base Case – Low Efficiency	94.5%	20.1	0.0889	0.156	0.00500	0.011

4.5.7 Oxygen Demand

The oxygen demand in Tail Lake will depend on the net accumulation of compounds that can be oxidized chemically. To estimate the maximum theoretical oxygen demand that may develop in Tail Lake, the water quality predictions were completed as for Scenario 1, i.e. nutrient degradation was not allowed within Tail Lake. For these conditions, solute concentrations in Tail Lake reach maximum values in Year 2, well before Tail Lake would spill. These concentrations would therefore represent the maximum oxygen demand that could develop in Tail Lake. The estimated solute concentrations and corresponding calculated oxygen demands are summarised in Table 4.16. For these calculations it was conservatively assumed that the ammonia would be completely oxidized to nitrate. As shown, the maximum oxygen demand that may develop in Tail Lake is about 24.1 mg/L. The solubility of oxygen is temperature dependent and, at a temperature of about 10°C, it is approximately 11 mg/L.

Table 4.16: Summary Estimated Maximum Oxygen Demand in Tail Lake Water

Compound	Maximum Concentration		Oxygen Demand	Oxygen Demand (mg/L)
	mg/L	mmole/L	(stoichiometry)	
CNO*	6.6	0.15	2	4.8
Total Ammonia-N*	0.99	0.06	2	2.0
Nitrite-N*	0.73	0.05	0.5	0.4
Org. Carbon	5.1	0.53	2	16.9
Total				24.1

Note * Assumes complete oxidation to nitrate

Furthermore, the oxygen demand in Tail Lake will also be offset by oxygen generated from photosynthesis and oxygen transfer during the open water season from wave action and mixing. The oxygen generated by photosynthesis often lead to supersaturated conditions where the dissolved oxygen concentration actually exceeds the maximum theoretical solubility. This has been observed at many sites where phytoplankton growth has been stimulated (e.g. at the Colomac Site, Chapman *et al.* 2002). In fact, at the Colomac Site, dissolved oxygen concentrations consistently were measured at or above saturation levels even though the oxygen demand at that site far exceeded the oxygen demand expected in Tail Lake.

Even if the oxygen demand is not satisfied within Tail Lake, the net oxygen demand that would result in Doris Creek when discharging at a rate of 1,000,000 m³ per year would amount to 1.4 mg/L. Clearly, this oxygen demand would readily be met in the creek by background concentrations, and would further be replenished as the water cascades over the waterfall.

It is therefore concluded that oxygen demand will have no discernable effects on the water in Doris Creek. Furthermore, considering the relatively low oxygen demand for the oxidation of nitrite, it is concluded that nitrite would not persist within Doris Creek, but would rapidly be oxidized.

5 Proposed Discharge Strategy

5.1 Key Components

Two possible strategies for the management of the discharge system have been identified as follows. In the first strategy, a fixed monthly flow rate, based on projected average monthly flow conditions and water quality in Doris Creek, and in water quality in Tail Lake, distributed according to the Doris Lake outflow hydrograph would be adopted. This is consistent with the modelling approach that has been adopted herein.

In the second strategy, discharge flows would actively be controlled according to currently measured i) flow conditions in Doris Creek, and, ii) water quality in Tail Lake and Doris Creek. In this strategy it should however be realized that, while flow rates in Doris Creek could be measured on a real time basis, there would always be a delay in obtaining water quality results. For either strategy, the effectiveness of the approach will depend on how rapidly water quality is likely to change within Doris Creek (background) and in Tail Lake.

Monitoring results to date suggest that significant changes in the background water quality in Doris Creek occur over periods of weeks rather than days. Similarly, when the discharge volume of water from the mill (about 36,000 m³ per month) is compared to the Tail Lake reservoir (typically about 2,200,000 m³) it is apparent that rate of change of water quality in Tail Lake too will not be rapid. It is therefore possible that reasonable performance can be achieved by either control strategy. Nonetheless, the latter strategy would significantly reduce the risk of discharging water in excess of the target rate.

The first strategy would be most simple to manage. Conceptually, a chart would be developed that would show correlations between water quality in Tail Lake and flow rates in Doris Creek for each month of the active discharge period. The discharge flow rate would be fixed for periods of up to a week and adjusted as required based on the performance. Monitoring would be undertaken downstream of the mixing zone in Doris Creek to determine the performance of the flow charts, and, if required, these charts may be adjusted to improve the performance. It would however be accepted that marginal exceedance of the target concentrations in Doris Creek may occur from time to time.

The second strategy would provide significantly better control on discharge rates and target concentrations (i.e. CCME guidelines) are likely to be achieved consistently throughout the open water season. It is therefore recommended that the latter strategy be adopted.

The key management and control components of the proposed discharge strategy will comprise:

- Real-time monitoring of flows in Doris Creek.
- Monitoring of water quality in Doris Creek and Tail Lake on a frequent basis.

- Managing the decant, or intake, location of the discharge system in Tail Lake to minimise suspended solids release.
- Controlling the discharge flow rate on a real-time basis.

A conceptual description of the system is provided in the next section.

5.2 Proposed Discharge Strategy

The primary objective of the Tail Lake water management strategy will be to meet CCME guidelines for the protection of freshwater aquatic life in Doris Creek, with the possible exception of nitrite.

Starting in Year 1, key elements for the implementation of the recommended strategy would be as follows:

- At commencement of operations, water quality in Tail Lake would be monitored on a regular basis. The frequency will be adjusted as required but may commence on a daily basis for select parameters. As the dynamics, of the system, i.e. rate of change in water quality, becomes better understood, the frequency of monitoring could be reduced. Key parameters would include cyanide compounds (these would also be monitored in the tailings as part of the operation of the cyanide detoxification system) copper together with selected metals and nutrients, including ammonia, nitrite and nitrate. For this purpose a low level environmental laboratory will be established at site. The laboratory will be equipped with a low level inductively coupled plasma (ICP) mass spectrophotometer (MS) to enable low detection analyses of metals. Details of the operation of the laboratory setup and technical information for the ICP-MS are provided in Appendix J.
- Before any discharge would commence, Tail Lake water would be submitted for toxicity testing and metals analysis. Only if the water passes the toxicity test and CCME criteria will water discharge commence. Water samples will subsequently be submitted at regular intervals for toxicity testing for the duration of the open water discharge period. Discharge would be suspended immediately should Tail Lake water fail the toxicity test, or not meet MMER criteria.

It is anticipated that at the start of the open water season the analytical turnaround time will likely prevent discharge for the first few days. Once results become available, and criteria for discharge are met, the discharge will be managed as follows:

- Real-time monitoring of the flows in Doris Creek will commence as soon as practical during the open water season. Real-time flow monitoring may comprise a pressure transducer installed in a stilling basin within Doris Creek, discharging through a calibrated V-notch weir. The pressure transducer would be connected to a programmable logic controller (PLC) that would record flows in Doris Creek and be used to control the discharge flow rate. The location of the weir is shown in Figure 5.1.

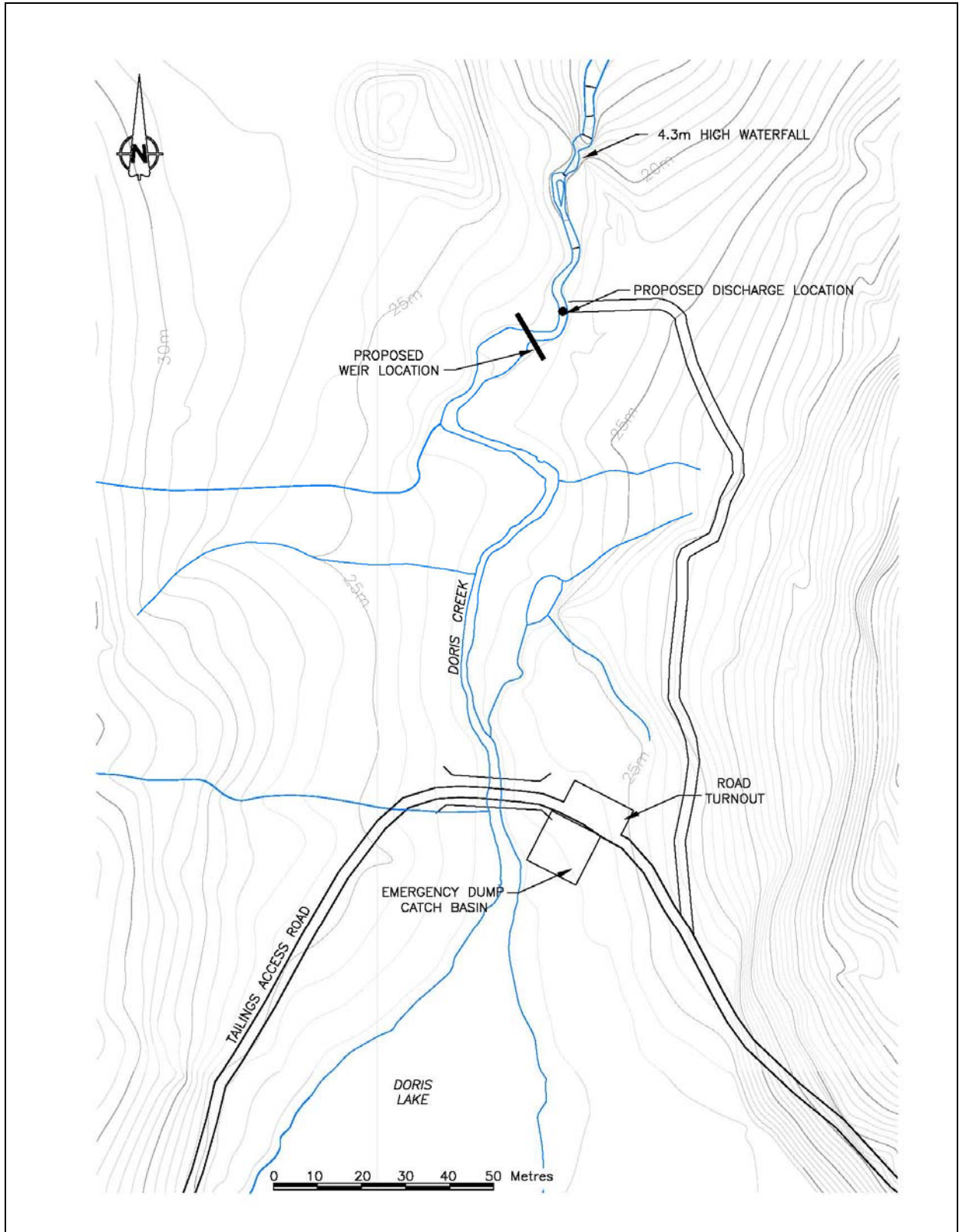


Figure 5.1: Proposed Doris Creek Flow Monitoring Weir and Tail Lake Discharge Locations

- Discharge from Tail Lake would occur with the aid of one or more pumps. Flow control may be achieved through either utilizing variable speed pumps, or, a fixed rate pump coupled with an actuated flow control valve connected to a split recycle/discharge pipeline. The pumps and/or flow control valve would be controlled by the PLC to discharge Tail Lake water at a fixed ratio relative to the flow in Doris Creek. The pump intakes in Tail Lake (for the operational period) would be mounted on a floating barge system that can be moved such that the intake is well away from the tailings discharge point to minimise suspended solids in the intake. If necessary, silt curtains could be installed around the pump intake to minimise intake of suspended solids. The discharge to Doris Creek will be located sufficiently downstream from the flow weir to ensure that the discharge will not interfere with the operation of the weir system, but sufficiently upstream of the waterfall to ensure complete mixing with Doris Creek. The proposed discharge location is shown in Figure 5.1.

Programming of the PLC to control the discharge flow rate will be undertaken as follows:

- Water quality would be monitored in Doris Creek and in Tail Lake at least two days in advance of commencing discharge. The Allowable Discharge Volume Ratio (ADVR) would be calculated from the copper concentrations in Tail Lake and in Doris Creek, and, calculations would be completed to verify that at that ratio, no other parameters would cause an exceedance of CCME guidelines in Doris Creek. If necessary, the ADVR would be adjusted as necessary to meet CCME guidelines or site specific objectives for Doris Creek.
- The Target Discharge Volume Ratio (TDVR) would then be set at 80 % of the ADVR and programmed into the PLC which will vary discharge flow rate according to the real-time measured flow in Doris Creek.
- Water sampling would be undertaken upstream of the stilling basin, at the end of pipe discharge from Tail Lake and downstream of the waterfall in Doris Creek. Initially, sampling would be undertaken on a daily basis to verify that the pumping system is performing accurately. In time, based on the observed variability of flow, copper and other parameters of significance in Doris Creek, and the variability of copper in Tail Lake, it may be possible to reduce the sample frequency.

The downstream together with the upstream and Tail Lake water quality monitoring results will be used to verify the performance of the discharge system at regular intervals and to make control adjustments as appropriate.

5.3 Contingency Discharge Strategy

As demonstrated in Section 4 of this report, Tail Lake can be operated successfully at several lower than optimum discharge rates. In the event that maximum allowable discharge flow rates are lower than estimated herein, the proposed control system will automatically adjust to the lower flow rates.

In the unlikely event that no discharge is possible at or after commencement of operations, water balance modelling has shown that Tail Lake has sufficient capacity to store water for several years after operations would cease. During this time it will be possible to monitor changes in water quality in Tail Lake and, either commence active discharge if suitable conditions develop, or, project water quality into the future to the time that the FSL will be reached. The effects of natural discharge would be re-assessed for that time and if acceptable for natural discharge, Tail Lake would be allowed to fill to its FSL and then allowed to overflow naturally until solute concentrations approach CCME guidelines to enable discharge of excess water contained in Tail Lake and allow breaching of the North Dam. This represents the first contingency strategy.

A second contingency is available for the management of the water contained in Tail Lake. The water quality monitoring undertaken in the early stages of the 'holding' period will identify the solutes that may be of concern at the time the FSL is reached. This will provide ample time to identify water treatment requirements, if any, that may be required to enable discharge of excess water when the FSL is reached. Construction and commissioning of a water treatment plant would represent a second level contingency; however it is unlikely that this contingency would ever have to be developed.

This report, **“Tail Lake Water Quality Model, Doris North Project, Hope Bay, Nunavut, Canada”**, has been prepared by SRK Consulting (Canada) Inc.

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Appendices

Appendix A

Water Balance Sample Calculations

ANNUAL WATER BALANCE CALCULATIONS				ANNUAL WATER BALANCE CALCULATIONS												
Year				1	1	1	1	1	1	1	1	1	1	1	1	1
Year 1 Totals				Year 1												
				1-Mar-07	1-Apr-07	1-May-07	1-Jun-07	1-Jul-07	1-Aug-07	1-Sep-07	1-Oct-07	1-Nov-07	1-Dec-07	1-Jan-08	1-Feb-08	
Days in month	Number	365		31	30	31	30	31	31	30	31	30	31	28	31	28
Rainfall (includes Snowfall as SWE)	mm/mo	207.3		10.8	11.9	15.7	17.3	24.4	30.9	26.9	27.0	14.4	11.6	8.0	8.4	
Water Yield (Runoff out of entire catchment)	mm/mo	180.4		0.0	0.0	0.0	97.5	46.0	14.3	17.9	4.7	0.0	0.0	0.0	0.0	
Lake Evaporation from free water surface	mm/mo	220.0		0	0	0	35	95	77	13	0	0	0	0	0	
Doris Lake outflow	m3/mo	16782706		0	0	0	7194379	4462019	1880064	2406482	839762	0	0	0	0	
Decant Ratio - Synchronized with Doris Hydrograph	-			0	0	0	0.4287	0.2659	0.1120	0.1434	0.0500	0	0	0	0	
Maximum Allowable Lake decant	m3/mo	1000000		0	0	0	428678	265870	112024	143391	50037	0	0	0	0	
Recirculation volume	m3/mo	144255		0	0	0	35472	36655	36655	35472	0	0	0	0	0	
Water Levels & Volumes																
				Max	Min											
Tail Lake Elevation at start of period (month)	m	29.28	28.07	28.30	28.6	28.7	28.8	28.7	28.5	28.4	28.3	28.4	28.5	28.7	28.8	
Tail Lake surface area at start of pime (month)	ha	92.38	77.86	81	85	86	87	86	84	82	81	82	84	85	86	
Renmaining catchment area at start of period (month)	ha	372.14	357.62	369	365	364	363	364	366	369	369	368	366	365	364	
Tail Lake WATER VOLUME at start of period (month)	m3	2731850	1956581	2196040	2267708	2338673	2415091	2350153	2217198	2145378	2104610	2156814	2229571	2302226	2371979	
Actual TAILINGS VOLUME at start of period (month)	m3	397336	0	0	16873	33202	50075	66404	83277	100151	116479	133353	149681	166555	183428	
Tailings level at start of period (month)	m	24.27	22.00	22	23.0	23.0	23.1	23.1	23.2	23.3	23.3	23.4	23.4	23.5	23.6	
Water cover thickness above tailings	m	6.30	3.80	6.3	5.6	5.7	5.7	5.6	5.3	5.1	5.0	5.0	5.1	5.2	5.2	
Water volume over and above tailings volume	m3	2408305	1559245	2196040	2250835	2305471	2365016	2283748	2133921	2045228	1988131	2023461	2079889	2135671	2188551	
Proportion of ice pack thickness remaining	m	1.00	0.00	1	0.8	0.6	0.4	0.2	0	0	0.2	0.4	0.6	0.8	1	
Column of equivalent water locked up in ice pack	m	2.30	0.00	2.30	1.84	1.38	0.92	0.46	0.00	0.00	0.46	0.92	1.38	1.84	2.30	
Depth to which Tail Lake is frozen (water beneath is not frozen)	m	29.28	26.00	26.0	26.8	27.3	27.9	28.3	28.5	28.4	27.9	27.5	27.2	26.8	26.5	
Volume of water and tailings NOT frozen	m3	2969469	810120	810120	1199325	1537115	1916033	2171783	2356821	2267796	1889928	1642888	1430775	1230077	1039034	
Volume of WATER not frozen over and above tailings volume	m3	2634678	416296	810120	1182451	1503913	1865958	2105379	2273544	2167646	1773449	1509536	1281094	1063522	856606	
SHORTFALL (If Negative recirculation cannot occur due to ice)	m3	2599206	416296	810120	1182451	1503913	1830486	2068724	2236889	2132173	1773449	1509536	1281094	1063522	855606	
Monthly Water Balance				Year 1 Totals												
Tailings Production	t/month	243820		20708	20040	20708	20040	20708	20708	20040	20708	20040	20708	20708	18704	
Solids Volume (Tailings)	m3/month	198668		16873	16329	16873	16329	16873	16873	16329	16873	16329	16873	16873	15240	
Water Volume associated with tailings deposition	m3/month	431582		36655	35472	36655	35472	36655	36655	35472	36655	35472	36655	36655	33108	
Sewage Inflow	m3/day	25039		2127	2058	2127	2058	2127	2058	2127	2058	2127	2058	2127	1921	
Mine Water Inflow	m3/day	85775		7285	7050	7285	7050	7285	7285	7050	7285	7050	7285	7285	6580	
Direct precipitation onto Tail Lake (rain & SWE)	m3/month	173783		8728	10056	13478	15092	20999	25804	22069	21918	11848	9715	6813	7263	
Water Yield (Runoff) from remaining catchment	m3/month	656714		0	0	0	353744	167390	52416	65782	17383	0	0	0	0	
Evaporation from Tail Lake	m3/month	187256		0	0	0	30533	81758	64300	10665	0	0	0	0	0	
Estimated Seepage losses	m3/day	0		0	0	0	0	0	0	0	0	0	0	0	0	
Recirculation	m3/month	144255		0	0	0	35472	36655	36655	35472	0	0	0	0	0	
Actual Decant Volume	m3/month	1000000		0	0	0	428678	265870	112024	143391	50037	0	0	0	0	
Actual Annual Decant Volume																1000000
Maximum permissible decant (water level at 28.3				0	0	0	428678	265870	112024	143391	50037	0	0	0	0	
Actual Annual Decant Volume																1000000
TOTAL WATER INFLOWS	m3/month			54795	54636	59545	413416	234455	124286	132431	85368	56428	55782	52880	48871	
TOTAL WATER OUTFLOWS	m3/month			0	0	0	494683	384283	212979	189528	50037	0	0	0	0	
INFLOWS - OUTFLOWS	m3/month			54795	54636	59545	-81267	-149827	-88693	-57097	35330	56428	55782	52880	48871	
Actual Annual INFLOWS - OUTFLOWS																41382
New Tailings Lake WATER Volume at end of period (month)	m3			2250835	2322344	2398218	2333824	2200325	2128505	2088281	2139940	2213242	2285353	2355106	2420850	
NEW Tail Lake WATER + TAILINGS Volume at end of period (month)	m3			2267708	2338673	2415091	2350153	2217198	2145378	2104610	2156814	2229571	2302226	2371979	2436090	
Dam design height - based on water balance + freeboard	m			31.80	32.10	32.21	32.33	32.23	32.02	31.90	31.83	31.92	32.04	32.15	32.26	
Maximum annual dam design height	m			32.33												
Cumulative Water Balance																
Tailings Production	t			20708	40748	61456	81496	102204	122912	142952	163660	183700	204408	225116	243820	
Solids Volume (Tailings)	m3			16873	33202	50075	66404	83277	100151	116479	133353	149681	166555	183428	198668	
Water Volume associated with tailings deposition	m3			36655	72127	108782	144255	180910	217564	253037	289692	325164	361819	398474	431582	
Sewage Inflow	m3			2127	4185	6311	8369	10496	12622	14680	16807	18865	20992	23118	25039	
Mine Water Inflow	m3			7285	14335	21620	28670	35955	43240	50290	57575	64625	71910	79195	85775	
Direct precipitation onto Tail Lake (rain & SWE)	m3			8728	18784	32262	47354	68353	94157	116225	138143	149991	159707	166520	173783	
Runoff from remaining catchment	m3			0	0	0	353744	521133	573549	639331	656714	656714	656714	656714	656714	
Evaporation from Tail Lake	m3			0	0	0	30533	112290	176591	187256	187256	187256	187256	187256	187256	
Estimated Seepage losses	m3			0	0	0	0	0	0	0	0	0	0	0	0	
Recirculation	m3			0	0	0	35472	72127	108782	144255	144255	144255	144255	144255	144255	
Maximum decant Volume	m3			0	0	0	428678	694548	806572	949963	1000000	1000000	1000000	1000000	1000000	
Cumulative TOTAL WATER INFLOWS	m3			54795	109431	168976	582392	816847	941133	1073564	1158931	1215360	1271142	1324021	1372892	
Cumulative TOTAL WATER OUTFLOWS	m3			0	0	0	494683	878966	1091945	1281473	1331511	1331511	1331511	1331511	1331511	
Extreme Rainfall Event																
Depth with 100% runoff all into lake area (2 year return)	m			0.096	0.092	0.091	0.089	0.090	0.093	0.095	0.096	0.095	0.093	0.091	0.090	
Depth with 100% runoff all into lake area (5 year return)	m			0.140	0.134	0.132	0.130	0.132	0.136	0.138	0.140	0.138	0.135	0.133	0.131	
Depth with 100% runoff all into lake area (10 year return)	m			0.170	0.162	0.160	0.157	0.159	0.164	0.167	0.169	0.167	0.164	0.161	0.159	
Depth with 100% runoff all into lake area (20 year return)	m			0.199	0.191	0.188	0.185	0.187	0.193	0.196	0.198	0.196	0.192	0.189	0.186	
Depth with 100% runoff all into lake area (50 year return)	m			0.240	0.230	0.226	0.222	0.225	0.232	0.236	0.239	0.236	0.232	0.229	0.224	
Depth with 100% runoff all into lake area (100 year return)	m			0.271	0.259	0.255	0.251	0.254	0.262	0.267	0.269	0.266	0.261	0.257	0.253	
Depth with 100% runoff all into lake area (200 year return)	m			0.303	0.290	0.286	0.281	0.285	0.294	0.299	0.302	0.298	0.293	0.288	0.284	
Depth with 100% runoff all into lake area (500 year return)	m			0.350	0.334	0.329	0.324	0.328	0.338	0.344	0.348	0.343	0.337	0.332	0.327	

ANNUAL WATER BALANCE CALCULATIONS				ANNUAL WATER BALANCE CALCULATIONS											
Year				2	2	2	2	2	2	2	2	2	2	2	2
Year 1 Totals				Year 2											
				29-Feb-08	31-Mar-08	30-Apr-08	31-May-08	30-Jun-08	31-Jul-08	31-Aug-08	30-Sep-08	31-Oct-08	30-Nov-08	31-Dec-08	31-Jan-09
Days in month	Number	365		31	30	31	30	31	31	30	31	30	31	30	28
Rainfall (includes Snowfall as SWE)	mm/mo	207.3		10.8	11.9	15.7	17.3	24.4	30.9	26.9	27.0	14.4	11.6	8.0	8.4
Water Yield (Runoff out of entire catchment)	mm/mo	180.4		0.0	0.0	0.0	97.5	46.0	14.3	17.9	4.7	0.0	0.0	0.0	0.0
Lake Evaporation from free water surface	mm/mo	220.0		0	0	0	35	95	77	13	0	0	0	0	0
Doris Lake outflow	m3/mo	16782706		0	0	0	7194379	4462019	1880064	2406482	839762	0	0	0	0
Decant Ratio - Synchronized with Doris Hydrograph	-	-		0	0	0	0.4287	0.2659	0.1120	0.1434	0.0500	0	0	0	0
Maximum Allowable Lake decant	m3/mo	1000000		0	0	0	428678	265870	112024	143391	50037	0	0	0	0
Recirculation volume	m3/mo	144255		0	0	0	35472	36655	36655	35472	0	0	0	0	0
Water Levels & Volumes															
				Max	Min										
Tail Lake Elevation at start of period (month)	m	29.28	28.07	28.9	29.0	29.1	29.2	29.1	28.9	28.8	28.7	28.8	28.9	29.0	29.1
Tail Lake surface area at start of pime (month)	ha	92.38	77.86	88	89	90	91	90	88	87	86	87	88	89	90
Renmaining catchment area at start of period (month)	ha	372.14	357.62	362	361	360	359	360	362	363	364	363	362	361	360
Tail Lake WATER VOLUME at start of period (month)	m3	2731850	1956581	2436090	2508491	2579974	2657048	2587487	2449764	2375323	2334376	2387603	2461003	2534156	2604238
Actual TAILINGS VOLUME at start of period (month)	m3	397336	0	198668	215541	231870	248743	265072	281945	298819	315148	332021	348350	365223	382096
Tailings level at start of period (month)	m	24.27	22.00	23.6	23.7	23.7	23.8	23.8	23.9	23.9	24.0	24.1	24.1	24.2	24.2
Water cover thickness above tailings	m	6.30	3.80	5.2	5.3	5.3	5.4	5.2	5.0	4.8	4.7	4.7	4.8	4.8	4.9
Water volume over and above tailings volume	m3	2408305	1559245	2237422	2292950	2348104	2408305	2322415	2167818	2076504	2019229	2055582	2112654	2168933	2222142
Proportion of ice pack thickness remaining	m	1.00	0.00	0.8	0.5	0.2	0	0	0	0	0.2	0.4	0.6	0.8	1
Column of equivalent water locked up in ice pack	m	2.30	0.00	1.84	1.15	0.46	0.00	0.00	0.00	0.00	0.46	0.92	1.38	1.84	2.30
Depth to which Tail Lake is frozen (water beneath is not frozen)	m	29.28	26.00	27.0	27.8	28.6	29.2	29.1	28.9	28.8	28.2	27.9	27.5	27.2	26.8
Volume of water and tailings NOT frozen	m3	2969469	810120	1348858	1853919	2428175	2883422	2802449	2639490	2549997	2153901	1887287	1655288	1435234	1225389
Volume of WATER not frozen over and above tailings volume	m3	2634678	416296	1150190	1638377	2196304	2634678	2537377	2357544	2251178	1838754	1555267	1306938	1070012	843293
SHORTFALL (If Negative recirculation cannot occur due to ice)	m3	2599206	416296	1150190	1638377	2196304	2599206	2500722	2320889	2215706	1838754	1555267	1306938	1070012	843293
Monthly Water Balance				649282											
Year 1 Totals															
Tailings Production	t/month	243820		20708	20040	20708	20040	20708	20708	20040	20708	20040	20708	20708	18704
Solids Volume (Tailings)	m3/month	198668		16873	16329	16873	16329	16873	16873	16329	16873	16329	16873	16873	15240
Water Volume associated with tailings deposition	m3/month	431582		36655	35472	36655	35472	36655	36655	35472	36655	35472	36655	36655	33108
Sewage Inflow	m3/day	25039		2127	2058	2127	2058	2127	2058	2127	2058	2127	2058	2127	1921
Mine Water Inflow	m3/day	85775		7285	7050	7285	7050	7285	7285	7050	7285	7050	7285	7285	6580
Direct precipitation onto Tail Lake (rain & SWE)	m3/month	173783		9462	10573	14135	15786	21997	27144	23274	23157	12491	10213	7142	7595
Water Yield (Runoff) from remaining catchment	m3/month	656714		0	0	0	349831	165508	51795	64981	17167	0	0	0	0
Evaporation from Tail Lake	m3/month	187256		0	0	0	31937	85644	67642	11248	0	0	0	0	0
Estimated Seepage losses	m3/day	0		0	0	0	0	0	0	0	0	0	0	0	0
Recirculation	m3/month	144255		0	0	0	35472	36655	36655	35472	0	0	0	0	0
Actual Decant Volume	m3/month	1000000		0	0	0	428678	265870	112024	143391	50037	0	0	0	0
Actual Annual Decant Volume															1000000
Maximum permissible decant (water level at 28.3				0	0	0	428678	265870	112024	143391	50037	0	0	0	0
Actual Annual Decant Volume															1000000
TOTAL WATER INFLOWS	m3/month			55528	55154	60201	410197	233572	125006	132836	86391	57072	56279	53209	49204
TOTAL WATER OUTFLOWS	m3/month			0	0	0	496088	388169	216320	190111	50037	0	0	0	0
INFLOWS - OUTFLOWS	m3/month			55528	55154	60201	-85890	-154597	-91314	-57275	36353	57072	56279	53209	49204
Actual Annual INFLOWS - OUTFLOWS															33923
New Tailings Lake WATER Volume at end of period (month)	m3			2491618	2563645	2640175	2571158	2432890	2358449	2318047	2370730	2444674	2517282	2587365	2653441
NEW Tail Lake WATER + TAILINGS Volume at end of period (month)	m3			2508491	2579974	2657048	2587487	2449764	2375323	2334376	2387603	2461003	2534156	2604238	268682
Dam design height - based on water balance + freeboard	m			32.36	32.47	32.57	32.68	32.58	32.38	32.27	32.20	32.28	32.40	32.50	32.60
Maximum annual dam design height	m			32.68											
Cumulative Water Balance															
				t											
Tailings Production	m3			264528	284568	305276	325316	346024	366732	386772	407480	427520	448228	468936	487640
Solids Volume (Tailings)	m3			215541	231870	248743	265072	281945	298819	315148	332021	348350	365223	382096	397336
Water Volume associated with tailings deposition	m3			468237	503709	540364	575836	612491	649146	684619	721273	756746	793401	830056	863163
Sewage Inflow	m3			27166	29224	31350	33408	35535	37661	39719	41846	43904	46031	48157	50078
Mine Water Inflow	m3			93060	100110	107395	114445	121730	129015	136065	143350	150400	157685	164970	171550
Direct precipitation onto Tail Lake (rain & SWE)	m3			183244	193817	207952	223738	245735	272880	296154	319311	331802	342015	349158	356753
Runoff from remaining catchment	m3			656714	656714	656714	1006545	1172054	1223849	1288830	1305996	1305996	1305996	1305996	1305996
Evaporation from Tail Lake	m3			187256	187256	187256	219193	304837	372478	383726	383726	383726	383726	383726	383726
Estimated Seepage losses	m3			0	0	0	0	0	0	0	0	0	0	0	0
Recirculation	m3			144255	144255	144255	179727	216382	253037	288509	288509	288509	288509	288509	288509
Maximum decant Volume	m3			1000000	1000000	1000000	1428678	1694548	1806572	1949963	2000000	2000000	2000000	2000000	2000000
Cumulative TOTAL WATER INFLOWS	m3			1428421	1483574	1543775	1953973	2187545	2312551	2445386	2531777	2588849	2645128	2698337	2747540
Cumulative TOTAL WATER OUTFLOWS	m3			1331511	1331511	1331511	1827598	2215767	2432087	2622198	2672235	2672235	2672235	2672235	2672235
Extreme Rainfall Event															
Depth with 100% runoff all into lake area (2 year return)	m			0.089	0.088	0.086	0.085	0.086	0.089	0.090	0.091	0.090	0.088	0.087	0.086
Depth with 100% runoff all into lake area (5 year return)	m			0.129	0.128	0.126	0.124	0.126	0.129	0.131	0.132	0.131	0.129	0.127	0.125
Depth with 100% runoff all into lake area (10 year return)	m			0.157	0.154	0.152	0.150	0.152	0.156	0.159	0.160	0.158	0.156	0.154	0.152
Depth with 100% runoff all into lake area (20 year return)	m			0.184	0.181	0.179	0.177	0.179	0.183	0.186	0.188	0.186	0.183	0.180	0.178
Depth with 100% runoff all into lake area (50 year return)	m			0.221	0.218	0.215	0.213	0.215	0.221	0.224	0.226	0.224	0.220	0.217	0.215
Depth with 100% runoff all into lake area (100 year return)	m			0.250	0.246	0.243	0.240	0.243	0.249	0.253	0.255	0.252	0.248	0.245	0.242
Depth with 100% runoff all into lake area (200 year return)	m			0.280	0.276	0.272	0.269	0.272	0.279	0.283	0.286	0.283	0.279	0.275	0.271
Depth with 100% runoff all into lake area (500 year return)	m			0.323	0.318	0.314	0.310	0.313	0.322	0.327	0.329	0.326	0.321	0.317	0.313

ANNUAL WATER BALANCE CALCULATIONS				ANNUAL WATER BALANCE CALCULATIONS												
Year				3	3	3	3	3	3	3	3	3	3	3	3	3
Year 1 Totals				Year 3												
				1-Mar-09	1-Apr-09	1-May-09	1-Jun-09	1-Jul-09	1-Aug-09	1-Sep-09	1-Oct-09	1-Nov-09	1-Dec-09	1-Jan-10	1-Feb-10	
Days in month	Number	365		31	30	31	30	31	31	30	31	31	30	31	28	
Rainfall (includes Snowfall as SWE)	mm/mo	207.3		10.8	11.9	15.7	17.3	24.4	30.9	26.9	27.0	14.4	11.6	8.0	8.4	
Water Yield (Runoff out of entire catchment)	mm/mo	180.4		0.0	0.0	0.0	97.5	46.0	14.3	17.9	4.7	0.0	0.0	0.0	0.0	
Lake Evaporation from free water surface	mm/mo	220.0		0	0	0	35	95	77	13	0	0	0	0	0	
Doris Lake outflow	m3/mo	16782706		0	0	0	7194379	4462019	1880064	2406482	839762	0	0	0	0	
Decant Ratio - Synchronized with Doris Hydrograph	-	-		0	0	0	0.4287	0.2659	0.1120	0.1434	0.0500	0	0	0	0	
Maximum Allowable Lake decant	m3/mo	1000000		0	0	0	428678	265870	112024	143391	50037	0	0	0	0	
Recirculation volume	m3/mo	144255		0	0	0	0	0	0	0	0	0	0	0	0	
Water Levels & Volumes																
				Max	Min											
Tail Lake Elevation at start of period (month)	m	29.28	28.07	29.2	29.2	29.2	29.3	29.2	28.9	28.8	28.7	28.7	28.7	28.8	28.8	
Tail Lake surface area at start of pime (month)	ha	92.38	77.86	91	92	92	92	91	89	87	86	86	86	87	87	
Renmaining catchment area at start of period (month)	ha	372.14	357.62	359	358	358	358	359	361	363	364	364	364	363	363	
Tail Lake WATER VOLUME at start of period (month)	m3	2731850	1956581	2668682	2687968	2707991	2731850	2644654	2489002	2397279	2339988	2339710	2361183	2380601	2396942	
Actual TAILINGS VOLUME at start of period (month)	m3	397336	0	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	
Tailings level at start of period (month)	m	24.27	22.00	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	
Water cover thickness above tailings	m	6.30	3.80	4.9	4.9	5.0	5.0	4.9	4.7	4.5	4.4	4.4	4.5	4.5	4.5	
Water volume over and above tailings volume	m3	2408305	1559245	2271345	2290631	2310654	2334514	2247317	2091665	1999943	1942652	1942374	1963847	1983265	1999606	
Proportion of ice pack thickness remaining	m	1.00	0.00	0.8	0.5	0.2	0	0	0	0	0.2	0.4	0.6	0.8	1	
Column of equivalent water locked up in ice pack	m	2.30	0.00	1.84	1.15	0.46	0.00	0.00	0.00	0.00	0.46	0.92	1.38	1.84	2.30	
Depth to which Tail Lake is frozen (water beneath is not frozen)	m	29.28	26.00	27.4	28.1	28.8	29.3	29.2	28.9	28.8	28.3	27.8	27.4	26.9	26.5	
Volume of water and tailings NOT frozen	m3	2969469	810120	1552596	2030566	2567421	2969469	2869060	2686268	2576493	2160266	1837003	1558951	1299727	1059144	
Volume of WATER not frozen over and above tailings volume	m3	2634678	416296	1155260	1633230	2170085	2572133	2471724	2288932	2179157	1762930	1439667	1161615	902391	661808	
SHORTFALL (If Negative recirculation cannot occur due to ice)	m3	2599206	416296	1155260	1633230	2170085	2572133	2471724	2288932	2179157	1762930	1439667	1161615	902391	661808	
Monthly Water Balance																
Year 1 Totals																
Tailings Production	t/month	243820		0	0	0	0	0	0	0	0	0	0	0	0	
Solids Volume (Tailings)	m3/month	198668		0	0	0	0	0	0	0	0	0	0	0	0	
Water Volume associated with tailings deposition	m3/month	431582		0	0	0	0	0	0	0	0	0	0	0	0	
Sewage Inflow	m3/day	25039		2127	2058	2127	2058	2127	2127	2058	2127	2058	2127	2127	1921	
Mine Water Inflow	m3/day	85775		7285	7050	7285	7050	7285	7285	7050	7285	7050	7285	7285	6580	
Direct precipitation onto Tail Lake (rain & SWE)	m3/month	173783		9874	10915	14448	15982	22218	27353	23381	23186	12365	10007	6929	7301	
Water Yield (Runoff) from remaining catchment	m3/month	656714		0	0	0	348725	165092	51699	64810	17162	0	0	0	0	
Evaporation from Tail Lake	m3/month	187256		0	0	0	32334	86503	68162	11299	0	0	0	0	0	
Estimated Seepage losses	m3/day	0		0	0	0	0	0	0	0	0	0	0	0	0	
Recirculation	m3/month	144255		0	0	0	0	0	0	0	0	0	0	0	0	
Actual Decant Volume	m3/month	1000000		0	0	0	428678	265870	112024	143391	50037	0	0	0	0	
Actual Annual Decant Volume																1000000
Maximum permissible decant (water level at 28.3				0	0	0	428678	265870	112024	143391	50037	0	0	0	0	
Actual Annual Decant Volume																1000000
TOTAL WATER INFLOWS	m3/month			19286	20023	23860	373815	196721	88463	97399	49759	21473	19418	16341	15801	
TOTAL WATER OUTFLOWS	m3/month			0	0	0	461012	352374	180185	154690	50037	0	0	0	0	
INFLOWS - OUTFLOWS	m3/month			19286	20023	23860	-87197	-155652	-91722	-57291	-278	21473	19418	16341	15801	
Actual Annual INFLOWS - OUTFLOWS																-255938
New Tailings Lake WATER Volume at end of period (month)	m3			2687968	2707991	2731850	2644654	2489002	2397279	2339988	2339710	2361183	2380601	2396942	2412744	
NEW Tail Lake WATER + TAILINGS Volume at end of period (month)	m3			2687968	2707991	2731850	2644654	2489002	2397279	2339988	2339710	2361183	2380601	2396942	2412744	
Dam design height - based on water balance + freeboard	m			32.69	32.72	32.75	32.78	32.66	32.44	32.30	32.21	32.21	32.24	32.27	32.30	
Maximum annual dam design height	m			32.78												
Cumulative Water Balance																
Tailings Production	t			487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	
Solids Volume (Tailings)	m3			397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	
Water Volume associated with tailings deposition	m3			863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	
Sewage Inflow	m3			52205	54263	56389	58447	60574	62700	64758	66885	68943	71070	73196	75117	
Mine Water Inflow	m3			178835	185885	193170	200220	207505	214790	221840	229125	236175	243460	250745	257325	
Direct precipitation onto Tail Lake (rain & SWE)	m3			366627	377542	391990	407972	430190	457543	480924	504110	516475	526481	533411	540711	
Runoff from remaining catchment	m3			1305996	1305996	1305996	1654722	1819814	1871512	1936422	1953584	1953584	1953584	1953584	1953584	
Evaporation from Tail Lake	m3			383726	383726	383726	416060	502563	570725	582024	582024	582024	582024	582024	582024	
Estimated Seepage losses	m3			0	0	0	0	0	0	0	0	0	0	0	0	
Recirculation	m3			288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	
Maximum decant Volume	m3			2000000	2000000	2000000	2428678	2694548	2806572	2949963	3000000	3000000	3000000	3000000	3000000	
Cumulative TOTAL WATER INFLOWS	m3			2766826	2786849	2810709	3184524	3381246	3469709	3567108	3616867	3638340	3657758	3674099	3689901	
Cumulative TOTAL WATER OUTFLOWS	m3			2672235	2672235	2672235	3133247	3485621	3665806	3820496	3870534	3870534	3870534	3870534	3870534	
Extreme Rainfall Event																
Depth with 100% runoff all into lake area (2 year return)	m			0.085	0.085	0.085	0.084	0.085	0.088	0.090	0.091	0.091	0.090	0.090	0.090	
Depth with 100% runoff all into lake area (5 year return)	m			0.124	0.124	0.123	0.123	0.125	0.128	0.130	0.132	0.132	0.131	0.131	0.130	
Depth with 100% runoff all into lake area (10 year return)	m			0.150	0.150	0.149	0.149	0.151	0.155	0.158	0.160	0.160	0.159	0.158	0.158	
Depth with 100% runoff all into lake area (20 year return)	m			0.176	0.176	0.175	0.174	0.177	0.182	0.185	0.188	0.188	0.187	0.186	0.185	
Depth with 100% runoff all into lake area (50 year return)	m			0.212	0.211	0.211	0.210	0.213	0.219	0.223	0.226	0.226	0.225	0.224	0.223	
Depth with 100% runoff all into lake area (100 year return)	m			0.239	0.238	0.238	0.237	0.240	0.247	0.252	0.255	0.255	0.254	0.252	0.252	
Depth with 100% runoff all into lake area (200 year return)	m			0.268	0.267	0.267	0.265	0.269	0.277	0.282	0.286	0.286	0.284	0.283	0.282	
Depth with 100% runoff all into lake area (500 year return)	m			0.309	0.308	0.307	0.306	0.310	0.319	0.325	0.329	0.329	0.328	0.326	0.325	

ANNUAL WATER BALANCE CALCULATIONS			ANNUAL WATER BALANCE CALCULATIONS														
Year			4	4	4	4	4	4	4	4	4	4	4	4	4	4	
Year 1 Totals			1-Mar-10	1-Apr-10	1-May-10	1-Jun-10	1-Jul-10	1-Aug-10	1-Sep-10	1-Oct-10	1-Nov-10	1-Dec-10	1-Jan-11	1-Feb-11			
Days in month	Number	365	31	30	31	30	31	31	30	31	30	31	31	28			
Rainfall (includes Snowfall as SWE)	mm/mo	207.3	10.8	11.9	15.7	17.3	24.4	30.9	26.9	27.0	14.4	11.6	8.0	8.4			
Water Yield (Runoff out of entire catchment)	mm/mo	180.4	0.0	0.0	0.0	97.5	46.0	14.3	17.9	4.7	0.0	0.0	0.0	0.0			
Lake Evaporation from free water surface	mm/mo	220.0	0	0	0	35	95	77	13	0	0	0	0	0			
Doris Lake outflow	m3/mo	16782706	0	0	0	7194379	4462019	1880064	2406482	839762	0	0	0	0			
Decant Ratio - Synchronized with Doris Hydrograph	-	-	0	0	0	0.4287	0.2659	0.1120	0.1434	0.0500	0	0	0	0			
Maximum Allowable Lake decant	m3/mo	1000000	0	0	0	428678	265870	112024	143391	50037	0	0	0	0			
Recirculation volume	m3/mo	144255	0	0	0	0	0	0	0	0	0	0	0	0			
Water Levels & Volumes			Max	Min													
Tail Lake Elevation at start of period (month)	m	29.28	28.07	28.8	28.8	28.9	28.9	28.7	28.5	28.3	28.2	28.3	28.3	28.3	28.3		
Tail Lake surface area at start of pime (month)	ha	92.38	77.86	87	87	88	88	86	83	81	80	80	81	81	81		
Renmaining catchment area at start of period (month)	ha	372.14	357.62	363	363	362	362	364	367	369	370	370	369	369	369		
Tail Lake WATER VOLUME at start of period (month)	m3	2731850	1956581	2412744	2422161	2432557	2446301	2355293	2195943	2098097	2031931	2070878	2082463	2091824	2098296		
Actual TAILINGS VOLUME at start of period (month)	m3	397336	0	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336		
Tailings level at start of period (month)	m	24.27	22.00	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3		
Water cover thickness above tailings	m	6.30	3.80	4.6	4.6	4.6	4.6	4.5	4.2	4.0	3.9	4.0	4.0	4.0	4.0		
Water volume over and above tailings volume	m3	2408305	1559245	2015407	2024824	2035220	2048965	1957956	1798607	1700760	1634595	1673542	1685126	1694488	1700960		
Proportion of ice pack thickness remaining	m	1.00	0.00	0.8	0.5	0.2	0	0	0	0	0.2	0.4	0.6	0.8	1		
Column of equivalent water locked up in ice pack	m	2.30	0.00	1.84	1.15	0.46	0.00	0.00	0.00	0.00	0.46	0.92	1.38	1.84	2.30		
Depth to which Tail Lake is frozen (water beneath is not frozen)	m	29.28	26.00	27.0	27.7	28.4	28.9	28.7	28.5	28.3	27.7	27.4	26.9	26.5	26.0		
Volume of water and tailings NOT frozen	m3	2969469	810120	1328207	1767645	2264615	2635349	2525754	2330554	2208787	1805228	1550737	1286378	1042224	818458		
Volume of WATER not frozen over and above tailings volume	m3	2634678	416296	930871	1370309	1867279	2238012	2128418	1933217	1811450	1407892	1153401	889042	644888	421122		
SHORTFALL (If Negative recirculation cannot occur due to ice)	m3	2599206	416296	930871	1370309	1867279	2238012	2128418	1933217	1811450	1407892	1153401	889042	644888	421122		
Monthly Water Balance			Year 1 Totals													656450	
Tailings Production	t/month	243820	0	0	0	0	0	0	0	0	0	0	0	0	0		
Solids Volume (Tailings)	m3/month	198668	0	0	0	0	0	0	0	0	0	0	0	0	0		
Water Volume associated with tailings deposition	m3/month	431582	0	0	0	0	0	0	0	0	0	0	0	0	0		
Sewage Inflow	m3/day	25039	0	0	0	0	0	0	0	0	0	0	0	0	0		
Mine Water Inflow	m3/day	85775	0	0	0	0	0	0	0	0	0	0	0	0	0		
Direct precipitation onto Tail Lake (rain & SWE)	m3/month	173783	9417	10396	13745	15187	21022	25672	21799	21488	11585	9361	6472	6808			
Water Yield (Runoff) from remaining catchment	m3/month	656714	0	0	0	353208	167346	52477	65961	17458	0	0	0	0	0		
Evaporation from Tail Lake	m3/month	187256	0	0	0	30725	81848	63971	10535	0	0	0	0	0	0		
Estimated Seepage losses	m3/day	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Recirculation	m3/month	144255	0	0	0	0	0	0	0	0	0	0	0	0	0		
Actual Decant Volume	m3/month	1000000	0	0	0	428678	265870	112024	143391	50037	0	0	0	0	0		
Actual Annual Decant Volume																1000000	
Maximum permissible decant (water level at 28.3			0	0	0	428678	265870	112024	143391	0	0	0	0	0	0		
Actual Annual Decant Volume																949963	
TOTAL WATER INFLOWS	m3/month		9417	10396	13745	368395	188368	78148	87760	38947	11585	9361	6472	6808			
TOTAL WATER OUTFLOWS	m3/month		0	0	0	459403	347718	175995	153926	0	0	0	0	0	0		
INFLOWS - OUTFLOWS	m3/month		9417	10396	13745	-91008	-159349	-97847	-66165	38947	11585	9361	6472	6808			
Actual Annual INFLOWS - OUTFLOWS																307640	
New Tailings Lake WATER Volume at end of period (month)	m3		2422161	2432557	2446301	2355293	2195943	2098097	2031931	2070878	2082463	2091824	2098296	2105104			
NEW Tail Lake WATER + TAILINGS Volume at end of period (month)	m3		2422161	2432557	2446301	2355293	2195943	2098097	2031931	2070878	2082463	2091824	2098296	2105104			
Dam design height - based on water balance + freeboard	m		32.32	32.34	32.35	32.37	32.23	31.98	31.82	31.70	31.77	31.79	31.81	31.81	31.82		
Maximum annual dam design height	m		32.37														
Cumulative Water Balance																	
Tailings Production	t		487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	487640		
Solids Volume (Tailings)	m3		397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336		
Water Volume associated with tailings deposition	m3		863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	863163		
Sewage Inflow	m3		75117	75117	75117	75117	75117	75117	75117	75117	75117	75117	75117	75117	75117		
Mine Water Inflow	m3		257325	257325	257325	257325	257325	257325	257325	257325	257325	257325	257325	257325	257325		
Direct precipitation onto Tail Lake (rain & SWE)	m3		550128	560524	574269	589456	610478	636149	657949	679437	691022	700383	706855	713663			
Runoff from remaining catchment	m3		1953584	1953584	1953584	2306792	2474138	2526615	2592576	2610034	2610034	2610034	2610034	2610034	2610034		
Evaporation from Tail Lake	m3		582024	582024	582024	612749	694597	758568	769103	769103	769103	769103	769103	769103	769103		
Estimated Seepage losses	m3		0	0	0	0	0	0	0	0	0	0	0	0	0		
Recirculation	m3		288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	288509		
Maximum decant Volume	m3		3000000	3000000	3000000	3428678	3694548	3806572	3949963	4000000	4000000	4000000	4000000	4000000	4000000		
Cumulative TOTAL WATER INFLOWS	m3		3699318	3709714	3723458	4091853	4280221	4358370	4446130	4485077	4496661	4506023	4512495	4519302			
Cumulative TOTAL WATER OUTFLOWS	m3		3870534	3870534	3870534	4329937	4677654	4853650	5007575	5007575	5007575	5007575	5007575	5007575	5007575		
Extreme Rainfall Event																	
Depth with 100% runoff all into lake area (2 year return)	m		0.089	0.089	0.089	0.089	0.090	0.094	0.096	0.098	0.097	0.096	0.096	0.096	0.096		
Depth with 100% runoff all into lake area (5 year return)	m		0.130	0.130	0.130	0.129	0.132	0.136	0.140	0.142	0.141	0.141	0.140	0.140	0.140		
Depth with 100% runoff all into lake area (10 year return)	m		0.157	0.157	0.157	0.156	0.159	0.165	0.169	0.172	0.171	0.170	0.170	0.169	0.169		
Depth with 100% runoff all into lake area (20 year return)	m		0.185	0.184	0.184	0.184	0.187	0.194	0.199	0.202	0.200	0.200	0.199	0.199	0.199		
Depth with 100% runoff all into lake area (50 year return)	m		0.222	0.222	0.222	0.221	0.225	0.233	0.239	0.244	0.241	0.240	0.240	0.239	0.239		
Depth with 100% runoff all into lake area (100 year return)	m		0.251	0.250	0.250	0.249	0.254	0.263	0.270	0.275	0.272	0.271	0.270	0.270	0.270		
Depth with 100% runoff all into lake area (200 year return)	m		0.281	0.281	0.280	0.279	0.285	0.295	0.303	0.308	0.305	0.304	0.303	0.303	0.303		
Depth with 100% runoff all into lake area (500 year return)	m		0.324	0.323	0.323	0.322	0.328	0.340	0.349	0.355	0.351	0.350	0.349	0.349	0.349		

ANNUAL WATER BALANCE CALCULATIONS			ANNUAL WATER BALANCE CALCULATIONS														
Year			5	5	5	5	5	5	5	5	5	5	5	5	5	5	
Year 1 Totals			1-Mar-11	1-Apr-11	1-May-11	1-Jun-11	1-Jul-11	1-Aug-11	1-Sep-11	1-Oct-11	1-Nov-11	1-Dec-11	1-Jan-12	1-Feb-12			
Days in month	Number	365	31	30	31	30	31	31	30	31	30	31	28	28			
Rainfall (includes Snowfall as SWE)	mm/mo	207.3	10.8	11.9	15.7	17.3	24.4	30.9	26.9	27.0	14.4	11.6	8.0	8.4			
Water Yield (Runoff out of entire catchment)	mm/mo	180.4	0.0	0.0	0.0	97.5	46.0	14.3	17.9	4.7	0.0	0.0	0.0	0.0			
Lake Evaporation from free water surface	mm/mo	220.0	0	0	0	35	95	77	13	0	0	0	0	0			
Doris Lake outflow	m3/mo	16782706	0	0	0	7194379	4462019	1880064	2406482	839762	0	0	0	0			
Decant Ratio - Synchronized with Doris Hydrograph	-	-	0	0	0	0.4287	0.2659	0.1120	0.1434	0.0500	0	0	0	0			
Maximum Allowable Lake decant	m3/mo	1000000	0	0	0	428678	265870	112024	143391	50037	0	0	0	0			
Recirculation volume	m3/mo	144255	0	0	0	0	0	0	0	0	0	0	0	0			
Water Levels & Volumes			Max	Min													
Tail Lake Elevation at start of period (month)	m	29.28	28.07	28.3	28.3	28.4	28.4	28.2	28.4	28.3	28.4	28.4	28.4	28.4			
Tail Lake surface area at start of pime (month)	ha	92.38	77.86	81	81	82	82	80	82	80	82	82	82	82			
Renmaining catchment area at start of period (month)	ha	372.14	357.62	369	369	368	368	370	368	370	368	368	368	368			
Tail Lake WATER VOLUME at start of period (month)	m3	2731850	1956581	2105104	2113872	2123556	2136364	2052193	2165847	2068371	2145622	2135079	2146862	2156382	2162964	2169886	
Actual TAILINGS VOLUME at start of period (month)	m3	397336	0	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	
Tailings level at start of period (month)	m	24.27	22.00	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	
Water cover thickness above tailings	m	6.30	3.80	4.1	4.1	4.1	4.1	4.0	4.2	4.0	4.1	4.1	4.1	4.1	4.1	4.2	
Water volume over and above tailings volume	m3	2408305	1559245	1707767	1716536	1726220	1739028	1654857	1768510	1671035	1748286	1737743	1749526	1759046	1765628	1765628	
Proportion of ice pack thickness remaining	m	1.00	0.00	0.8	0.5	0.2	0	0	0	0	0.2	0.4	0.6	0.8	1	1	
Column of equivalent water locked up in ice pack	m	2.30	0.00	1.84	1.15	0.46	0.00	0.00	0.00	0.00	0.46	0.92	1.38	1.84	2.30	2.30	
Depth to which Tail Lake is frozen (water beneath is not frozen)	m	29.28	26.00	26.5	27.2	27.9	28.4	28.2	28.4	28.3	27.9	27.5	27.0	26.6	26.1	26.1	
Volume of water and tailings NOT frozen	m3	2969469	810120	1054095	1454065	1911923	2256570	2151211	2293245	2171534	1937494	1619631	1349702	1099931	870486	870486	
Volume of WATER not frozen over and above tailings volume	m3	2634678	416296	656758	1056729	1514587	1859234	1753874	1895908	1774197	1540158	1222294	952366	702595	473150	473150	
SHORTFALL (If Negative recirculation cannot occur due to ice)	m3	2599206	416296	656758	1056729	1514587	1859234	1753874	1895908	1774197	1540158	1222294	952366	702595	473150	473150	
Monthly Water Balance			Year 1 Totals														
Tailings Production	t/month	243820	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Solids Volume (Tailings)	m3/month	198668	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Water Volume associated with tailings deposition	m3/month	431582	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Sewage Inflow	m3/day	25039	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Mine Water Inflow	m3/day	85775	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Direct precipitation onto Tail Lake (rain & SWE)	m3/month	173783	8768	9684	12808	14160	19529	25482	21626	22152	11783	9520	6582	6922	6922	6922	
Water Yield (Runoff) from remaining catchment	m3/month	656714	0	0	0	358995	170160	52565	66076	17342	0	0	0	0	0	0	
Evaporation from Tail Lake	m3/month	187256	0	0	0	28648	76036	63498	10451	0	0	0	0	0	0	0	
Estimated Seepage losses	m3/day	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Recirculation	m3/month	144255	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Actual Decant Volume	m3/month	1000000	0	0	0	428678	265870	112024	143391	50037	0	0	0	0	0	0	
Actual Annual Decant Volume																1000000	
Maximum permissible decant (water level at 28.3			0	0	0	428678	0	112024	0	50037	0	0	0	0	0	0	
Actual Annual Decant Volume																590739	
TOTAL WATER INFLOWS	m3/month		8768	9684	12808	373155	189689	78046	87702	39494	11783	9520	6582	6922	6922	6922	
TOTAL WATER OUTFLOWS	m3/month		0	0	0	457326	76036	175522	10451	50037	0	0	0	0	0	0	
INFLOWS - OUTFLOWS	m3/month		8768	9684	12808	-84171	113653	-97475	77251	-10543	11783	9520	6582	6922	6922	6922	
Actual Annual INFLOWS - OUTFLOWS																64782	
New Tailings Lake WATER Volume at end of period (month)	m3		2113872	2123556	2136364	2052193	2165847	2068371	2145622	2135079	2146862	2156382	2162964	2169886	2169886	2169886	
NEW Tail Lake WATER + TAILINGS Volume at end of period (month)	m3		2113872	2123556	2136364	2052193	2165847	2068371	2145622	2135079	2146862	2156382	2162964	2169886	2169886	2169886	
Dam design height - based on water balance + freeboard	m		31.83	31.84	31.86	31.88	31.74	31.93	31.77	31.90	31.88	31.90	31.92	31.93	31.93	31.93	
Maximum annual dam design height	m		31.93														
Cumulative Water Balance																	
Tailings Production	t		487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	
Solids Volume (Tailings)	m3		397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	
Water Volume associated with tailings deposition	m3		863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	
Sewage Inflow	m3		75117	75117	75117	75117	75117	75117	75117	75117	75117	75117	75117	75117	75117	75117	
Mine Water Inflow	m3		257325	257325	257325	257325	257325	257325	257325	257325	257325	257325	257325	257325	257325	257325	
Direct precipitation onto Tail Lake (rain & SWE)	m3		722431	732115	744923	759084	778613	804094	825720	847872	859655	869175	875757	882679	882679	882679	
Runoff from remaining catchment	m3		2610034	2610034	2610034	2969029	3139189	3191754	3257830	3275172	3275172	3275172	3275172	3275172	3275172	3275172	
Evaporation from Tail Lake	m3		769103	769103	769103	797751	873787	937285	947736	947736	947736	947736	947736	947736	947736	947736	
Estimated Seepage losses	m3		0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Recirculation	m3		288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	
Maximum decant Volume	m3		4000000	4000000	4000000	4428678	4694548	4806572	4949963	5000000	5000000	5000000	5000000	5000000	5000000	5000000	
Cumulative TOTAL WATER INFLOWS	m3		4528071	4537754	4550563	4923718	5113407	5191453	5279156	5318650	5330433	5339953	5346534	5353456	5353456	5353456	
Cumulative TOTAL WATER OUTFLOWS	m3		5007575	5007575	5007575	5464901	5540937	5716459	5726910	5776947	5776947	5776947	5776947	5776947	5776947	5776947	
Extreme Rainfall Event																	
Depth with 100% runoff all into lake area (2 year return)	m		0.096	0.096	0.095	0.095	0.097	0.094	0.097	0.095	0.095	0.095	0.095	0.095	0.094	0.094	
Depth with 100% runoff all into lake area (5 year return)	m		0.140	0.139	0.139	0.139	0.142	0.138	0.141	0.138	0.139	0.138	0.138	0.138	0.138	0.138	
Depth with 100% runoff all into lake area (10 year return)	m		0.169	0.169	0.168	0.168	0.171	0.166	0.171	0.167	0.168	0.167	0.167	0.167	0.167	0.167	
Depth with 100% runoff all into lake area (20 year return)	m		0.198	0.198	0.197	0.197	0.201	0.195	0.200	0.196	0.197	0.196	0.196	0.196	0.196	0.196	
Depth with 100% runoff all into lake area (50 year return)	m		0.239	0.238	0.238	0.237	0.242	0.235	0.241	0.236	0.237	0.236	0.236	0.236	0.236	0.236	
Depth with 100% runoff all into lake area (100 year return)	m		0.269	0.269	0.268	0.267	0.273	0.265	0.272	0.267	0.267	0.267	0.266	0.266	0.266	0.266	
Depth with 100% runoff all into lake area (200 year return)	m		0.302	0.301	0.301	0.300	0.306	0.297	0.305	0.299	0.300	0.299	0.299	0.298	0.298	0.298	
Depth with 100% runoff all into lake area (500 year return)	m		0.348	0.347	0.346	0.345	0.353	0.343	0.352	0.344	0.345	0.344	0.344	0.344	0.344	0.343	

ANNUAL WATER BALANCE CALCULATIONS			ANNUAL WATER BALANCE CALCULATIONS											
Year			6	6	6	6	6	6	6	6	6	6	6	6
Year 1 Totals			Year 6											
			29-Feb-12	31-Mar-12	30-Apr-12	31-May-12	30-Jun-12	31-Jul-12	31-Aug-12	30-Sep-12	31-Oct-12	30-Nov-12	31-Dec-12	31-Jan-13
Days in month	Number	365	31	30	31	30	31	31	30	31	30	31	28	
Rainfall (includes Snowfall as SWE)	mm/mo	207.3	10.8	11.9	15.7	17.3	24.4	30.9	26.9	27.0	14.4	11.6	8.0	8.4
Water Yield (Runoff out of entire catchment)	mm/mo	180.4	0.0	0.0	0.0	97.5	46.0	14.3	17.9	4.7	0.0	0.0	0.0	0.0
Lake Evaporation from free water surface	mm/mo	220.0	0	0	0	35	95	77	13	0	0	0	0	0
Doris Lake outflow	m3/mo	16782706	0	0	0	7194379	4462019	1880064	2406482	839762	0	0	0	0
Decant Ratio - Synchronized with Doris Hydrograph	-	-	0	0	0	0.4287	0.2659	0.1120	0.1434	0.0500	0	0	0	0
Maximum Allowable Lake decant	m3/mo	1000000	0	0	0	428678	265870	112024	143391	50037	0	0	0	0
Recirculation volume	m3/mo	144255	0	0	0	0	0	0	0	0	0	0	0	0
Water Levels & Volumes														
			Max	Min										
Tail Lake Elevation at start of period (month)	m	29.28	28.07	28.4	28.5	28.5	28.3	28.1	28.1	28.2	28.3	28.3	28.3	28.4
Tail Lake surface area at start of pime (month)	ha	92.38	77.86	83	83	83	83	81	78	78	80	81	81	82
Renmaining catchment area at start of period (month)	ha	372.14	357.62	367	367	367	367	369	372	372	370	369	369	368
Tail Lake WATER VOLUME at start of period (month)	m3	2731850	1956581	2169886	2178801	2188646	2201666	2115947	1962119	1979370	2056701	2095770	2107433	2116856
Actual TAILINGS VOLUME at start of period (month)	m3	397336	0	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336
Tailings level at start of period (month)	m	24.27	22.00	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3
Water cover thickness above tailings	m	6.30	3.80	4.2	4.2	4.2	4.2	4.1	3.8	3.8	4.0	4.0	4.1	4.1
Water volume over and above tailings volume	m3	2408305	1559245	1772550	1781465	1791310	1804330	1718611	1564782	1582034	1659365	1698434	1710096	1719520
Proportion of ice pack thickness remaining	m	1.00	0.00	0.8	0.5	0.2	0	0	0	0	0.2	0.4	0.6	0.8
Column of equivalent water locked up in ice pack	m	2.30	0.00	1.84	1.15	0.46	0.00	0.00	0.00	0.46	0.92	1.38	1.84	2.30
Depth to which Tail Lake is frozen (water beneath is not frozen)	m	29.28	26.00	26.6	27.3	28.0	28.5	28.3	28.1	28.1	27.8	27.4	27.0	26.5
Volume of water and tailings NOT frozen	m3	2969469	810120	1111999	1520691	1987198	2337633	2231101	2037481	2059336	1834150	1577481	1310948	1064600
Volume of WATER not frozen over and above tailings volume	m3	2634678	416296	714662	1123354	1589862	1940297	1833764	1640145	1661999	1436814	1180144	913611	667264
SHORTFALL (If Negative recirculation cannot occur due to ice)	m3	2599206	416296	714662	1123354	1589862	1940297	1833764	1640145	1661999	1436814	1180144	913611	667264
Monthly Water Balance														
Year 1 Totals														
Tailings Production	t/month	243820	0	0	0	0	0	0	0	0	0	0	0	0
Solids Volume (Tailings)	m3/month	198668	0	0	0	0	0	0	0	0	0	0	0	0
Water Volume associated with tailings deposition	m3/month	431582	0	0	0	0	0	0	0	0	0	0	0	0
Sewage Inflow	m3/day	25039	0	0	0	0	0	0	0	0	0	0	0	0
Mine Water Inflow	m3/day	85775	0	0	0	0	0	0	0	0	0	0	0	0
Direct precipitation onto Tail Lake (rain & SWE)	m3/month	173783	8915	9845	13020	14393	19866	24099	21087	21637	11662	9424	6515	6852
Water Yield (Runoff) from remaining catchment	m3/month	656714	0	0	0	357684	169524	53205	66434	17432	0	0	0	0
Evaporation from Tail Lake	m3/month	187256	0	0	0	29118	77349	60052	10191	0	0	0	0	0
Estimated Seepage losses	m3/day	0	0	0	0	0	0	0	0	0	0	0	0	0
Recirculation	m3/month	144255	0	0	0	0	0	0	0	0	0	0	0	0
Actual Decant Volume	m3/month	1000000	0	0	0	428678	265870	112024	143391	50037	0	0	0	0
Actual Annual Decant Volume														1000000
Maximum permissible decant (water level at 28.3			0	0	0	428678	265870	0	0	0	0	0	0	0
Actual Annual Decant Volume														694548
TOTAL WATER INFLOWS	m3/month		8915	9845	13020	372077	189391	77304	87521	39069	11662	9424	6515	6852
TOTAL WATER OUTFLOWS	m3/month		0	0	0	457796	343219	60052	10191	0	0	0	0	0
INFLOWS - OUTFLOWS	m3/month		8915	9845	13020	-85719	-153828	17252	77331	39069	11662	9424	6515	6852
Actual Annual INFLOWS - OUTFLOWS														-39662
New Tailings Lake WATER Volume at end of period (month)	m3		2178801	2188646	2201666	2115947	1962119	1979370	2056701	2095770	2107433	2116856	2123371	2130224
NEW Tail Lake WATER + TAILINGS Volume at end of period (month)	m3		2178801	2188646	2201666	2115947	1962119	1979370	2056701	2095770	2107433	2116856	2123371	2130224
Dam design height - based on water balance + freeboard	m		31.94	31.95	31.97	31.99	31.85	31.58	31.61	31.75	31.81	31.83	31.85	31.86
Maximum annual dam design height	m		31.99											
Cumulative Water Balance														
Tailings Production	t		487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	487640
Solids Volume (Tailings)	m3		397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336
Water Volume associated with tailings deposition	m3		863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	863163
Sewage Inflow	m3		75117	75117	75117	75117	75117	75117	75117	75117	75117	75117	75117	75117
Mine Water Inflow	m3		257325	257325	257325	257325	257325	257325	257325	257325	257325	257325	257325	257325
Direct precipitation onto Tail Lake (rain & SWE)	m3		891594	901439	914459	928852	948718	972817	993904	1015541	1027204	1036627	1043142	1049995
Runoff from remaining catchment	m3		3275172	3275172	3275172	3632857	3802381	3855586	3922020	3939452	3939452	3939452	3939452	3939452
Evaporation from Tail Lake	m3		947736	947736	947736	976854	1054203	1114255	1124445	1124445	1124445	1124445	1124445	1124445
Estimated Seepage losses	m3		0	0	0	0	0	0	0	0	0	0	0	0
Recirculation	m3		288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	288509
Maximum decant Volume	m3		5000000	5000000	5000000	5428678	5694548	5806572	5949663	6000000	6000000	6000000	6000000	6000000
Cumulative TOTAL WATER INFLOWS	m3		5362372	5372217	5385237	5757314	5946705	6024008	6111530	6150599	6162261	6171685	6178200	6185053
Cumulative TOTAL WATER OUTFLOWS	m3		5776947	5776947	5776947	6234744	6577962	6638014	6648205	6648205	6648205	6648205	6648205	6648205
Extreme Rainfall Event														
Depth with 100% runoff all into lake area (2 year return)	m		0.094	0.094	0.094	0.094	0.096	0.100	0.099	0.097	0.096	0.096	0.096	0.095
Depth with 100% runoff all into lake area (5 year return)	m		0.137	0.137	0.137	0.136	0.139	0.145	0.145	0.142	0.140	0.140	0.139	0.139
Depth with 100% runoff all into lake area (10 year return)	m		0.166	0.166	0.165	0.165	0.169	0.176	0.175	0.171	0.169	0.169	0.169	0.168
Depth with 100% runoff all into lake area (20 year return)	m		0.195	0.195	0.194	0.194	0.198	0.207	0.206	0.201	0.199	0.198	0.198	0.197
Depth with 100% runoff all into lake area (50 year return)	m		0.235	0.234	0.234	0.233	0.238	0.249	0.247	0.242	0.239	0.239	0.238	0.238
Depth with 100% runoff all into lake area (100 year return)	m		0.265	0.264	0.264	0.263	0.269	0.280	0.279	0.273	0.270	0.269	0.269	0.268
Depth with 100% runoff all into lake area (200 year return)	m		0.297	0.296	0.296	0.295	0.301	0.314	0.313	0.306	0.303	0.302	0.301	0.301
Depth with 100% runoff all into lake area (500 year return)	m		0.342	0.342	0.341	0.340	0.347	0.362	0.361	0.353	0.349	0.348	0.347	0.346

ANNUAL WATER BALANCE CALCULATIONS				ANNUAL WATER BALANCE CALCULATIONS												
Year				7	7	7	7	7	7	7	7	7	7	7	7	7
Year 1 Totals				Year 7												
				1-Mar-13	1-Apr-13	1-May-13	1-Jun-13	1-Jul-13	1-Aug-13	1-Sep-13	1-Oct-13	1-Nov-13	1-Dec-13	1-Jan-14	1-Feb-14	
Days in month	Number	365		31	30	31	30	31	31	30	31	31	30	31	28	
Rainfall (includes Snowfall as SWE)	mm/mo	207.3		10.8	11.9	15.7	17.3	24.4	30.9	26.9	27.0	14.4	11.6	8.0	8.4	
Water Yield (Runoff out of entire catchment)	mm/mo	180.4		0.0	0.0	0.0	97.5	46.0	14.3	17.9	4.7	0.0	0.0	0.0	0.0	
Lake Evaporation from free water surface	mm/mo	220.0		0	0	0	35	95	77	13	0	0	0	0	0	
Doris Lake outflow	m3/mo	16782706		0	0	0	7194379	4462019	1880064	2406482	839762	0	0	0	0	
Decant Ratio - Synchronized with Doris Hydrograph	-			0	0	0	0.4287	0.2659	0.1120	0.1434	0.0500	0	0	0	0	
Maximum Allowable Lake decant	m3/mo	1000000		0	0	0	428678	265870	112024	143391	50037	0	0	0	0	
Recirculation volume	m3/mo	144255		0	0	0	0	0	0	0	0	0	0	0	0	
Water Levels & Volumes																
				Max	Min											
Tail Lake Elevation at start of period (month)	m	29.28	28.07	28.4	28.4	28.4	28.4	28.3	28.5	28.3	28.2	28.3	28.3	28.3	28.3	
Tail Lake surface area at start of pime (month)	ha	92.38	77.86	82	82	82	82	81	83	81	79	80	81	81	81	
Renmaining catchment area at start of period (month)	ha	372.14	357.62	368	368	368	368	369	367	369	371	370	369	369	369	
Tail Lake WATER VOLUME at start of period (month)	m3	2731850	1956581	2130224	2139050	2148797	2161688	2076910	2189931	2092158	2025998	2064915	2076480	2085827	2092288	
Actual TAILINGS VOLUME at start of period (month)	m3	397336	0	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	
Tailings level at start of period (month)	m	24.27	22.00	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	
Water cover thickness above tailings	m	6.30	3.80	4.1	4.1	4.1	4.2	4.0	4.2	4.0	3.9	4.0	4.0	4.0	4.0	
Water volume over and above tailings volume	m3	2408305	1559245	1732888	1741714	1751461	1764352	1679573	1792594	1694821	1628661	1667578	1679144	1688490	1694952	
Proportion of ice pack thickness remaining	m	1.00	0.00	0.8	0.5	0.2	0	0	0	0	0.2	0.4	0.6	0.8	1	
Column of equivalent water locked up in ice pack	m	2.30	0.00	1.84	1.15	0.46	0.00	0.00	0.00	0.00	0.46	0.92	1.38	1.84	2.30	
Depth to which Tail Lake is frozen (water beneath is not frozen)	m	29.28	26.00	26.5	27.2	27.9	28.4	28.3	28.5	28.3	27.7	27.3	26.9	26.5	26.0	
Volume of water and tailings NOT frozen	m3	2969469	810120	1076550	1479929	1941169	2288080	2182246	2323111	2201353	1798291	1544325	1280489	1038864	813632	
Volume of WATER not frozen over and above tailings volume	m3	2634678	416296	679214	1082593	1543833	1890743	1784910	1925775	1804017	1400955	1146988	883153	639527	416296	
SHORTFALL (If Negative recirculation cannot occur due to ice)	m3	2599206	416296	679214	1082593	1543833	1890743	1784910	1925775	1804017	1400955	1146988	883153	639527	416296	
Monthly Water Balance																
Year 1 Totals																
Tailings Production	t/month	243820		0	0	0	0	0	0	0	0	0	0	0	0	
Solids Volume (Tailings)	m3/month	198668		0	0	0	0	0	0	0	0	0	0	0	0	
Water Volume associated with tailings deposition	m3/month	431582		0	0	0	0	0	0	0	0	0	0	0	0	
Sewage Inflow	m3/day	25039		0	0	0	0	0	0	0	0	0	0	0	0	
Mine Water Inflow	m3/day	85775		0	0	0	0	0	0	0	0	0	0	0	0	
Direct precipitation onto Tail Lake (rain & SWE)	m3/month	173783		8826	9747	12891	14252	19662	25634	21765	21453	11566	9346	6462	6797	
Water Yield (Runoff) from remaining catchment	m3/month	656714		0	0	0	358480	169911	52494	65984	17464	0	0	0	0	
Evaporation from Tail Lake	m3/month	187256		0	0	0	28833	76551	63877	10518	0	0	0	0	0	
Estimated Seepage losses	m3/day	0		0	0	0	0	0	0	0	0	0	0	0	0	
Recirculation	m3/month	144255		0	0	0	0	0	0	0	0	0	0	0	0	
Actual Decant Volume	m3/month	1000000		0	0	0	428678	265870	112024	143391	50037	0	0	0	0	
Actual Annual Decant Volume																1000000
Maximum permissible decant (water level at 28.3				0	0	0	428678	0	112024	143391	0	0	0	0	0	
Actual Annual Decant Volume																684093
TOTAL WATER INFLOWS	m3/month			8826	9747	12891	372732	189572	78128	87749	38917	11566	9346	6462	6797	
TOTAL WATER OUTFLOWS	m3/month			0	0	0	457511	76551	175901	153909	0	0	0	0	0	
INFLOWS - OUTFLOWS	m3/month			8826	9747	12891	-84779	113021	-97773	-66160	38917	11566	9346	6462	6797	
Actual Annual INFLOWS - OUTFLOWS																-31139
New Tailings Lake WATER Volume at end of period (month)	m3			2139050	2148797	2161688	2076910	2189931	2092158	2025998	2064915	2076480	2085827	2092288	2099085	
NEW Tail Lake WATER + TAILINGS Volume at end of period (month)	m3			2139050	2148797	2161688	2076910	2189931	2092158	2025998	2064915	2076480	2085827	2092288	2099085	
Dam design height - based on water balance + freeboard	m			31.87	31.89	31.90	31.92	31.78	31.97	31.81	31.69	31.76	31.78	31.80	31.81	
Maximum annual dam design height	m			31.97												
Cumulative Water Balance																
Tailings Production	t			487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	
Solids Volume (Tailings)	m3			397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	
Water Volume associated with tailings deposition	m3			863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	
Sewage Inflow	m3			75117	75117	75117	75117	75117	75117	75117	75117	75117	75117	75117	75117	
Mine Water Inflow	m3			257325	257325	257325	257325	257325	257325	257325	257325	257325	257325	257325	257325	
Direct precipitation onto Tail Lake (rain & SWE)	m3			1058821	1068568	1081459	1095711	1115372	1141006	1162771	1184224	1195789	1205136	1211597	1218394	
Runoff from remaining catchment	m3			3939452	3939452	3939452	4297933	4467843	4520338	4586322	4603786	4603786	4603786	4603786	4603786	
Evaporation from Tail Lake	m3			1124445	1124445	1124445	1153278	1229829	1293706	1304225	1304225	1304225	1304225	1304225	1304225	
Estimated Seepage losses	m3			0	0	0	0	0	0	0	0	0	0	0	0	
Recirculation	m3			288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	
Maximum decant Volume	m3			6000000	6000000	6000000	6428678	6694548	6806572	6949963	7000000	7000000	7000000	7000000	7000000	
Cumulative TOTAL WATER INFLOWS	m3			6193878	6203625	6216517	6589249	6778821	6856949	6944698	6983615	6995181	7004527	7010989	7017785	
Cumulative TOTAL WATER OUTFLOWS	m3			6648205	6648205	6648205	7105716	7182267	7358168	7512077	7512077	7512077	7512077	7512077	7512077	
Extreme Rainfall Event																
Depth with 100% runoff all into lake area (2 year return)	m			0.095	0.095	0.095	0.095	0.097	0.094	0.096	0.098	0.097	0.097	0.096	0.096	
Depth with 100% runoff all into lake area (5 year return)	m			0.139	0.138	0.138	0.138	0.141	0.137	0.140	0.143	0.141	0.141	0.140	0.140	
Depth with 100% runoff all into lake area (10 year return)	m			0.168	0.168	0.167	0.167	0.170	0.165	0.170	0.173	0.171	0.170	0.170	0.170	
Depth with 100% runoff all into lake area (20 year return)	m			0.197	0.197	0.196	0.196	0.200	0.194	0.199	0.203	0.201	0.200	0.199	0.199	
Depth with 100% runoff all into lake area (50 year return)	m			0.237	0.237	0.236	0.236	0.241	0.234	0.240	0.244	0.241	0.241	0.240	0.240	
Depth with 100% runoff all into lake area (100 year return)	m			0.268	0.267	0.266	0.265	0.271	0.264	0.270	0.275	0.272	0.271	0.271	0.270	
Depth with 100% runoff all into lake area (200 year return)	m			0.300	0.299	0.299	0.298	0.304	0.296	0.303	0.309	0.305	0.304	0.304	0.303	
Depth with 100% runoff all into lake area (500 year return)	m			0.346	0.345	0.344	0.343	0.351	0.341	0.349	0.356	0.352	0.351	0.350	0.349	

ANNUAL WATER BALANCE CALCULATIONS				ANNUAL WATER BALANCE CALCULATIONS												
Year				8	8	8	8	8	8	8	8	8	8	8	8	8
Year 1 Totals				Year 8												
				1-Mar-14	1-Apr-14	1-May-14	1-Jun-14	1-Jul-14	1-Aug-14	1-Sep-14	1-Oct-14	1-Nov-14	1-Dec-14	1-Jan-15	1-Feb-15	
Days in month	Number	365		31	30	31	30	31	31	30	31	30	31	30	28	
Rainfall (includes Snowfall as SWE)	mm/mo	207.3		10.8	11.9	15.7	17.3	24.4	30.9	26.9	27.0	14.4	11.6	8.0	8.4	
Water Yield (Runoff out of entire catchment)	mm/mo	180.4		0.0	0.0	0.0	97.5	46.0	14.3	17.9	4.7	0.0	0.0	0.0	0.0	
Lake Evaporation from free water surface	mm/mo	220.0		0	0	0	35	95	77	13	0	0	0	0	0	
Doris Lake outflow	m3/mo	16782706		0	0	0	7194379	4462019	1880064	2406482	839762	0	0	0	0	
Decant Ratio - Synchronized with Doris Hydrograph	-			0	0	0	0.4287	0.2659	0.1120	0.1434	0.0500	0	0	0	0	
Maximum Allowable Lake decant	m3/mo	1000000		0	0	0	428678	265870	112024	143391	50037	0	0	0	0	
Recirculation volume	m3/mo	144255		0	0	0	0	0	0	0	0	0	0	0	0	
Water Levels & Volumes																
				Max	Min											
Tail Lake Elevation at start of period (month)	m	29.28	28.07	28.3	28.3	28.4	28.4	28.2	28.422	28.257	28.4	28.4	28.4	28.4	28.4	
Tail Lake surface area at start of pime (month)	ha	92.38	77.86	81	81	81	82	80	82	80	82	82	82	82	82	
Renmaining catchment area at start of period (month)	ha	372.14	357.62	369	369	369	368	370	368	370	368	368	368	368	368	
Tail Lake WATER VOLUME at start of period (month)	m3	2731850	1956581	2099085	2107840	2117508	2130296	2046272	2160078	2062675	2139931	2129362	2141127	2150633	2157205	
Actual TAILINGS VOLUME at start of period (month)	m3	397336	0	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	
Tailings level at start of period (month)	m	24.27	22.00	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	
Water cover thickness above tailings	m	6.30	3.80	4.0	4.1	4.1	4.1	4.0	4.1	4.0	4.1	4.1	4.1	4.1	4.1	
Water volume over and above tailings volume	m3	2408305	1559245	1701749	1710503	1720172	1732960	1648936	1762742	1665339	1742595	1732025	1743791	1753297	1759869	
Proportion of ice pack thickness remaining	m	1.00	0.00	0.8	0.5	0.2	0	0	0	0	0.2	0.4	0.6	0.8	1	
Column of equivalent water locked up in ice pack	m	2.30	0.00	1.84	1.15	0.46	0.00	0.00	0.00	0.00	0.46	0.92	1.38	1.84	2.30	
Depth to which Tail Lake is frozen (water beneath is not frozen)	m	29.28	26.00	26.5	27.2	27.9	28.4	28.2	28.4	28.3	27.9	27.5	27.0	26.6	26.1	
Volume of water and tailings NOT frozen	m3	2969469	810120	1048715	1447863	1904906	2249007	2143764	2286079	2164382	1930904	1613506	1344069	1094793	865848	
Volume of WATER not frozen over and above tailings volume	m3	2634678	416296	651378	1050527	1507570	1851670	1746428	1888743	1767046	1533568	1216170	946733	697456	468512	
SHORTFALL (If Negative recirculation cannot occur due to ice)	m3	2599206	416296	651378	1050527	1507570	1851670	1746428	1888743	1767046	1533568	1216170	946733	697456	468512	
Monthly Water Balance																
Year 1 Totals																
Tailings Production	t/month	243820		0	0	0	0	0	0	0	0	0	0	0	0	
Solids Volume (Tailings)	m3/month	198668		0	0	0	0	0	0	0	0	0	0	0	0	
Water Volume associated with tailings deposition	m3/month	431582		0	0	0	0	0	0	0	0	0	0	0	0	
Sewage Inflow	m3/day	25039		0	0	0	0	0	0	0	0	0	0	0	0	
Mine Water Inflow	m3/day	85775		0	0	0	0	0	0	0	0	0	0	0	0	
Direct precipitation onto Tail Lake (rain & SWE)	m3/month	173783		8754	9668	12788	14138	19497	25445	21592	22120	11765	9506	6572	6912	
Water Yield (Runoff) from remaining catchment	m3/month	656714		0	0	0	359119	170220	52582	66099	17348	0	0	0	0	
Evaporation from Tail Lake	m3/month	187256		0	0	0	28603	75911	63406	10435	0	0	0	0	0	
Estimated Seepage losses	m3/day	0		0	0	0	0	0	0	0	0	0	0	0	0	
Recirculation	m3/month	144255		0	0	0	0	0	0	0	0	0	0	0	0	
Actual Decant Volume	m3/month	1000000		0	0	0	428678	265870	112024	143391	50037	0	0	0	0	
Actual Annual Decant Volume																1000000
Maximum permissible decant (water level at 28.3				0	0	0	428678	0	112024	0	50037	0	0	0	0	
Actual Annual Decant Volume																590739
TOTAL WATER INFLOWS	m3/month			8754	9668	12788	373257	189718	78027	87691	39468	11765	9506	6572	6912	
TOTAL WATER OUTFLOWS	m3/month			0	0	0	457281	75911	175430	10435	50037	0	0	0	0	
INFLOWS - OUTFLOWS	m3/month			8754	9668	12788	-84024	113806	-97403	77256	-10569	11765	9506	6572	6912	
Actual Annual INFLOWS - OUTFLOWS																65032
New Tailings Lake WATER Volume at end of period (month)	m3			2107840	2117508	2130296	2046272	2160078	2062675	2139931	2129362	2141127	2150633	2157205	2164117	
NEW Tail Lake WATER + TAILINGS Volume at end of period (month)	m3			2107840	2117508	2130296	2046272	2160078	2062675	2139931	2129362	2141127	2150633	2157205	2164117	
Dam design height - based on water balance + freeboard	m			31.82	31.83	31.85	31.87	31.73	31.92	31.76	31.89	31.87	31.89	31.91	31.92	
Maximum annual dam design height	m			31.92												
Cumulative Water Balance																
Tailings Production	t			487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	
Solids Volume (Tailings)	m3			397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	
Water Volume associated with tailings deposition	m3			863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	
Sewage Inflow	m3			75117	75117	75117	75117	75117	75117	75117	75117	75117	75117	75117	75117	
Mine Water Inflow	m3			257325	257325	257325	257325	257325	257325	257325	257325	257325	257325	257325	257325	
Direct precipitation onto Tail Lake (rain & SWE)	m3			1227149	1236817	1249605	1263743	1283241	1308685	1330278	1352398	1364163	1373669	1380241	1387153	
Runoff from remaining catchment	m3			4603786	4603786	4603786	4962905	5133126	5185707	5251806	5269154	5269154	5269154	5269154	5269154	
Evaporation from Tail Lake	m3			1304225	1304225	1304225	1332828	1408739	1472145	1482580	1482580	1482580	1482580	1482580	1482580	
Estimated Seepage losses	m3			0	0	0	0	0	0	0	0	0	0	0	0	
Recirculation	m3			288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	
Maximum decant Volume	m3			7000000	7000000	7000000	7428678	7694548	7806572	7949663	8000000	8000000	8000000	8000000	8000000	
Cumulative TOTAL WATER INFLOWS	m3			7026540	7036208	7048996	7422254	7611971	7689998	7777689	7817157	7828922	7838429	7845001	7851913	
Cumulative TOTAL WATER OUTFLOWS	m3			7512077	7512077	7512077	7969358	8045269	8220699	8231134	8281172	8281172	8281172	8281172	8281172	
Extreme Rainfall Event																
Depth with 100% runoff all into lake area (2 year return)	m			0.096	0.096	0.096	0.095	0.097	0.095	0.097	0.095	0.095	0.095	0.095	0.095	
Depth with 100% runoff all into lake area (5 year return)	m			0.140	0.140	0.139	0.139	0.142	0.138	0.141	0.138	0.139	0.138	0.138	0.138	
Depth with 100% runoff all into lake area (10 year return)	m			0.169	0.169	0.169	0.168	0.172	0.167	0.171	0.168	0.168	0.167	0.167	0.167	
Depth with 100% runoff all into lake area (20 year return)	m			0.199	0.198	0.198	0.197	0.202	0.196	0.201	0.197	0.197	0.197	0.196	0.196	
Depth with 100% runoff all into lake area (50 year return)	m			0.239	0.239	0.238	0.237	0.243	0.236	0.242	0.237	0.237	0.237	0.236	0.236	
Depth with 100% runoff all into lake area (100 year return)	m			0.270	0.269	0.268	0.268	0.274	0.266	0.272	0.267	0.268	0.267	0.266	0.266	
Depth with 100% runoff all into lake area (200 year return)	m			0.303	0.302	0.301	0.300	0.307	0.298	0.306	0.299	0.300	0.299	0.299	0.298	
Depth with 100% runoff all into lake area (500 year return)	m			0.349	0.348	0.347	0.346	0.354	0.343	0.352	0.345	0.346	0.345	0.344	0.343	

ANNUAL WATER BALANCE CALCULATIONS			ANNUAL WATER BALANCE CALCULATIONS													
Year			9	9	9	9	9	9	9	9	9	9	9	9	9	9
Year 1 Totals			Year 9													
			1-Mar-15	1-Apr-15	1-May-15	1-Jun-15	1-Jul-15	1-Aug-15	1-Sep-15	1-Oct-15	1-Nov-15	1-Dec-15	1-Jan-16	1-Feb-16		
Days in month	Number	365	31	30	31	30	31	31	30	31	30	31	30	28		
Rainfall (includes Snowfall as SWE)	mm/mo	207.3	10.8	11.9	15.7	17.3	24.4	30.9	26.9	27.0	14.4	11.6	8.0	8.4		
Water Yield (Runoff out of entire catchment)	mm/mo	180.4	0.0	0.0	0.0	97.5	46.0	14.3	17.9	4.7	0.0	0.0	0.0	0.0		
Lake Evaporation from free water surface	mm/mo	220.0	0	0	0	35	95	77	13	0	0	0	0	0		
Doris Lake outflow	m3/mo	16782706	0	0	0	7194379	4462019	1880064	2406482	839762	0	0	0	0		
Decant Ratio - Synchronized with Doris Hydrograph	-	-	0	0	0	0.4287	0.2659	0.1120	0.1434	0.0500	0	0	0	0		
Maximum Allowable Lake decant	m3/mo	1000000	0	0	0	428678	265870	112024	143391	50037	0	0	0	0		
Recirculation volume	m3/mo	144255	0	0	0	0	0	0	0	0	0	0	0	0		
Water Levels & Volumes																
			Max	Min												
Tail Lake Elevation at start of period (month)	m	29.28	28.07	28.4	28.4	28.5	28.5	28.3	28.1	28.1	28.2	28.3	28.3	28.34	28.35	
Tail Lake surface area at start of pime (month)	ha	92.38	77.86	82	83	83	83	81	78	78	80	81	81	81	81	
Renmaining catchment area at start of period (month)	ha	372.14	357.62	368	367	367	367	369	372	372	370	369	369	369	369	
Tail Lake WATER VOLUME at start of period (month)	m3	2731850	1956581	2164117	2173020	2182851	2195852	2110268	1956581	1973911	2051247	2090289	2101935	2111345	2117850	
Actual TAILINGS VOLUME at start of period (month)	m3	397336	0	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	
Tailings level at start of period (month)	m	24.27	22.00	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	
Water cover thickness above tailings	m	6.30	3.80	4.2	4.2	4.2	4.2	4.1	3.8	3.8	4.0	4.0	4.1	4.1	4.1	
Water volume over and above tailings volume	m3	2408305	1559245	1766781	1775683	1785514	1798516	1712932	1559245	1576575	1653911	1692953	1704598	1714008	1720514	
Proportion of ice pack thickness remaining	m	1.00	0.00	0.8	0.5	0.2	0	0	0	0	0.2	0.4	0.6	0.8	1	
Column of equivalent water locked up in ice pack	m	2.30	0.00	1.84	1.15	0.46	0.00	0.00	0.00	0.00	0.46	0.92	1.38	1.84	2.30	
Depth to which Tail Lake is frozen (water beneath is not frozen)	m	29.28	26.00	26.6	27.3	28.0	28.5	28.3	28.1	28.1	27.8	27.4	26.9	26.5	26.1	
Volume of water and tailings NOT frozen	m3	2969469	810120	1106844	1514768	1980515	2330441	2224007	2030459	2052423	1827786	1571595	1305539	1059674	834176	
Volume of WATER not frozen over and above tailings volume	m3	2634678	416296	709507	1117432	1583179	1933105	1826670	1633123	1655087	1430450	1174259	908203	662337	436840	
SHORTFALL (If Negative recirculation cannot occur due to ice)	m3	2599206	416296	709507	1117432	1583179	1933105	1826670	1633123	1655087	1430450	1174259	908203	662337	436840	
Monthly Water Balance			39042													
Year 1 Totals																
Tailings Production	t/month	243820	0	0	0	0	0	0	0	0	0	0	0	0	0	
Solids Volume (Tailings)	m3/month	198668	0	0	0	0	0	0	0	0	0	0	0	0	0	
Water Volume associated with tailings deposition	m3/month	431582	0	0	0	0	0	0	0	0	0	0	0	0	0	
Sewage Inflow	m3/day	25039	0	0	0	0	0	0	0	0	0	0	0	0	0	
Mine Water Inflow	m3/day	85775	0	0	0	0	0	0	0	0	0	0	0	0	0	
Direct precipitation onto Tail Lake (rain & SWE)	m3/month	173783	8902	9831	13002	14372	19837	24059	21053	21605	11645	9410	6506	6843		
Water Yield (Runoff) from remaining catchment	m3/month	656714	0	0	0	357799	169580	53223	66457	17438	0	0	0	0	0	
Evaporation from Tail Lake	m3/month	187256	0	0	0	29077	77234	59952	10174	0	0	0	0	0	0	
Estimated Seepage losses	m3/day	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Recirculation	m3/month	144255	0	0	0	0	0	0	0	0	0	0	0	0	0	
Actual Decant Volume	m3/month	1000000	0	0	0	428678	265870	112024	143391	50037	0	0	0	0	0	
Actual Annual Decant Volume																1000000
Maximum permissible decant (water level at 28.3			0	0	0	428678	265870	0	0	0	0	0	0	0	0	
Actual Annual Decant Volume																694548
TOTAL WATER INFLOWS	m3/month		8902	9831	13002	372171	189417	77282	87510	39042	11645	9410	6506	6843		
TOTAL WATER OUTFLOWS	m3/month		0	0	0	457755	343104	59952	10174	0	0	0	0	0	0	
INFLOWS - OUTFLOWS	m3/month		8902	9831	13002	-85584	-153687	17330	77336	39042	11645	9410	6506	6843		
Actual Annual INFLOWS - OUTFLOWS																-39424
New Tailings Lake WATER Volume at end of period (month)	m3		2173020	2182851	2195852	2110268	1956581	1973911	2051247	2090289	2101935	2111345	2117850	2124693		
NEW Tail Lake WATER + TAILINGS Volume at end of period (month)	m3		2173020	2182851	2195852	2110268	1956581	1973911	2051247	2090289	2101935	2111345	2117850	2124693		
Dam design height - based on water balance + freeboard	m		31.93	31.94	31.96	31.98	31.84	31.57	31.60	31.74	31.80	31.82	31.84	31.85		
Maximum annual dam design height	m		31.98													
Cumulative Water Balance																
Tailings Production	t		487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	
Solids Volume (Tailings)	m3		397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	
Water Volume associated with tailings deposition	m3		863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	
Sewage Inflow	m3		75117	75117	75117	75117	75117	75117	75117	75117	75117	75117	75117	75117	75117	
Mine Water Inflow	m3		257325	257325	257325	257325	257325	257325	257325	257325	257325	257325	257325	257325	257325	
Direct precipitation onto Tail Lake (rain & SWE)	m3		1396056	1405886	1418888	1433261	1453098	1477156	1498209	1519814	1531459	1540869	1547375	1554217	1562171	
Runoff from remaining catchment	m3		5269154	5269154	5269154	5269154	5269154	5269154	5269154	5269154	5269154	5269154	5269154	5269154	5269154	
Evaporation from Tail Lake	m3		1482580	1482580	1482580	1511657	1588891	1648843	1659018	1659018	1659018	1659018	1659018	1659018	1659018	
Estimated Seepage losses	m3		0	0	0	0	0	0	0	0	0	0	0	0	0	
Recirculation	m3		288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	
Maximum decant Volume	m3		8000000	8000000	8000000	8428678	8694548	8806572	8949963	9000000	9000000	9000000	9000000	9000000	9000000	
Cumulative TOTAL WATER INFLOWS	m3		7860815	7870646	7883647	8255819	8445236	8522518	8610028	8649070	8660715	8670125	8676631	8683474	8690317	
Cumulative TOTAL WATER OUTFLOWS	m3		8281172	8281172	8281172	8738927	9082031	9141983	9152157	9152157	9152157	9152157	9152157	9152157	9152157	
Extreme Rainfall Event																
Depth with 100% runoff all into lake area (2 year return)	m		0.094	0.094	0.094	0.094	0.096	0.100	0.099	0.097	0.096	0.096	0.096	0.096	0.096	
Depth with 100% runoff all into lake area (5 year return)	m		0.138	0.137	0.137	0.136	0.139	0.146	0.145	0.142	0.140	0.140	0.139	0.139	0.139	
Depth with 100% runoff all into lake area (10 year return)	m		0.167	0.166	0.166	0.165	0.169	0.176	0.175	0.172	0.170	0.169	0.169	0.168	0.168	
Depth with 100% runoff all into lake area (20 year return)	m		0.195	0.195	0.195	0.194	0.198	0.207	0.206	0.201	0.199	0.199	0.198	0.198	0.198	
Depth with 100% runoff all into lake area (50 year return)	m		0.235	0.235	0.234	0.233	0.239	0.249	0.248	0.242	0.240	0.239	0.238	0.238	0.238	
Depth with 100% runoff all into lake area (100 year return)	m		0.265	0.265	0.264	0.263	0.269	0.281	0.279	0.273	0.270	0.270	0.269	0.268	0.268	
Depth with 100% runoff all into lake area (200 year return)	m		0.298	0.297	0.296	0.295	0.302	0.315	0.313	0.306	0.303	0.302	0.302	0.302	0.301	
Depth with 100% runoff all into lake area (500 year return)	m		0.343	0.342	0.341	0.340	0.348	0.363	0.361	0.353	0.349	0.348	0.348	0.348	0.347	

ANNUAL WATER BALANCE CALCULATIONS				ANNUAL WATER BALANCE CALCULATIONS											
Year				10	10	10	10	10	10	10	10	10	10	10	10
Year 1 Totals				Year 10											
				29-Feb-16	31-Mar-16	30-Apr-16	31-May-16	30-Jun-16	31-Jul-16	31-Aug-16	30-Sep-16	31-Oct-16	30-Nov-16	31-Dec-16	31-Jan-17
Days in month	Number	365		31	30	31	30	31	31	30	31	30	31	28	
Rainfall (includes Snowfall as SWE)	mm/mo	207.3		10.8	11.9	15.7	17.3	24.4	30.9	26.9	27.0	14.4	11.6	8.0	8.4
Water Yield (Runoff out of entire catchment)	mm/mo	180.4		0.0	0.0	0.0	97.5	46.0	14.3	17.9	4.7	0.0	0.0	0.0	0.0
Lake Evaporation from free water surface	mm/mo	220.0		0	0	0	35	95	77	13	0	0	0	0	0
Doris Lake outflow	m3/mo	16782706		0	0	0	7194379	4462019	1880064	2406482	839762	0	0	0	0
Decant Ratio - Synchronized with Doris Hydrograph	-			0	0	0	0.4287	0.2659	0.1120	0.1434	0.0500	0	0	0	0
Maximum Allowable Lake decant	m3/mo	1000000		0	0	0	428678	265870	112024	143391	50037	0	0	0	0
Recirculation volume	m3/mo	144255		0	0	0	0	0	0	0	0	0	0	0	0
Water Levels & Volumes															
				Max	Min										
Tail Lake Elevation at start of period (month)	m	29.28	28.07	28.36	28.38	28.39	28.415	28.272	28.5	28.3	28.4	28.4	28.4	28.4	28.5
Tail Lake surface area at start of pime (month)	ha	92.38	77.86	82	82	82	82	80	83	81	82	82	82	83	83
Renmaining catchment area at start of period (month)	ha	372.14	357.62	368	368	368	368	370	367	369	368	368	368	367	367
Tail Lake WATER VOLUME at start of period (month)	m3	2731850	1956581	2124693	2133506	2143240	2156113	2071467	2184627	2086919	2164154	2153697	2165535	2175100	2181713
Actual TAILINGS VOLUME at start of period (month)	m3	397336	0	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336
Tailings level at start of period (month)	m	24.27	22.00	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3
Water cover thickness above tailings	m	6.30	3.80	4.1	4.1	4.1	4.1	4.0	4.2	4.0	4.2	4.1	4.2	4.2	4.2
Water volume over and above tailings volume	m3	2408305	1559245	1727357	1736170	1745903	1758777	1674131	1787290	1689583	1766817	1756360	1768199	1777764	1784377
Proportion of ice pack thickness remaining	m	1.00	0.00	0.8	0.5	0.2	0	0	0	0	0.2	0.4	0.6	0.8	1
Column of equivalent water locked up in ice pack	m	2.30	0.00	1.84	1.15	0.46	0.00	0.00	0.00	0.00	0.46	0.92	1.38	1.84	2.30
Depth to which Tail Lake is frozen (water beneath is not frozen)	m	29.28	26.00	26.5	27.2	27.9	28.4	28.3	28.5	28.3	28.0	27.5	27.1	26.6	26.2
Volume of water and tailings NOT frozen	m3	2969469	810120	1071606	1474238	1934736	2281150	2175419	2316541	2194792	1958928	1639555	1368034	1116658	885592
Volume of WATER not frozen over and above tailings volume	m3	2634678	416296	674269	1076901	1537399	1883814	1778083	1919204	1797455	1561592	1242219	970698	719322	488256
SHORTFALL (If Negative recirculation cannot occur due to ice)	m3	2599206	416296	674269	1076901	1537399	1883814	1778083	1919204	1797455	1561592	1242219	970698	719322	488256
Monthly Water Balance															
Year 1 Totals															
Tailings Production	t/month	243820		0	0	0	0	0	0	0	0	0	0	0	0
Solids Volume (Tailings)	m3/month	198668		0	0	0	0	0	0	0	0	0	0	0	0
Water Volume associated with tailings deposition	m3/month	431582		0	0	0	0	0	0	0	0	0	0	0	0
Sewage Inflow	m3/day	25039		0	0	0	0	0	0	0	0	0	0	0	0
Mine Water Inflow	m3/day	85775		0	0	0	0	0	0	0	0	0	0	0	0
Direct precipitation onto Tail Lake (rain & SWE)	m3/month	173783		8813	9733	12873	14232	19633	25601	21734	22256	11839	9565	6612	6954
Water Yield (Runoff) from remaining catchment	m3/month	656714		0	0	0	358593	169965	52510	66004	17324	0	0	0	0
Evaporation from Tail Lake	m3/month	187256		0	0	0	28792	76438	63794	10504	0	0	0	0	0
Estimated Seepage losses	m3/day	0		0	0	0	0	0	0	0	0	0	0	0	0
Recirculation	m3/month	144255		0	0	0	0	0	0	0	0	0	0	0	0
Actual Decant Volume	m3/month	1000000		0	0	0	428678	265870	112024	143391	50037	0	0	0	0
Actual Annual Decant Volume															1000000
Maximum permissible decant (water level at 28.3				0	0	0	428678	0	112024	0	50037	0	0	0	0
Actual Annual Decant Volume															590739
TOTAL WATER INFLOWS	m3/month			8813	9733	12873	372825	189598	78110	87739	39580	11839	9565	6612	6954
TOTAL WATER OUTFLOWS	m3/month			0	0	0	457470	76438	175818	10504	50037	0	0	0	0
INFLOWS - OUTFLOWS	m3/month			8813	9733	12873	-84646	113159	-97708	77235	-10457	11839	9565	6612	6954
Actual Annual INFLOWS - OUTFLOWS															63974
New Tailings Lake WATER Volume at end of period (month)	m3			2133506	2143240	2156113	2071467	2184627	2086919	2164154	2153697	2165535	2175100	2181713	2188667
NEW Tail Lake WATER + TAILINGS Volume at end of period (month)	m3			2133506	2143240	2156113	2071467	2184627	2086919	2164154	2153697	2165535	2175100	2181713	2188667
Dam design height - based on water balance + freeboard	m			31.86	31.88	31.89	31.91	31.77	31.96	31.80	31.93	31.91	31.93	31.95	31.96
Maximum annual dam design height	m			31.96											
Cumulative Water Balance															
Tailings Production	t			487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	487640	487640
Solids Volume (Tailings)	m3			397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336	397336
Water Volume associated with tailings deposition	m3			863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	863163	863163
Sewage Inflow	m3			75117	75117	75117	75117	75117	75117	75117	75117	75117	75117	75117	75117
Mine Water Inflow	m3			257325	257325	257325	257325	257325	257325	257325	257325	257325	257325	257325	257325
Direct precipitation onto Tail Lake (rain & SWE)	m3			1563031	1572764	1585637	1599869	1619501	1645102	1666836	1689092	1700931	1710496	1717109	1724063
Runoff from remaining catchment	m3			5933651	5933651	5933651	6292244	6462209	6514719	6580723	6598047	6598047	6598047	6598047	6598047
Evaporation from Tail Lake	m3			1659018	1659018	1659018	1687810	1764248	1828042	1838546	1838546	1838546	1838546	1838546	1838546
Estimated Seepage losses	m3			0	0	0	0	0	0	0	0	0	0	0	0
Recirculation	m3			288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	288509	288509
Maximum decant Volume	m3			9000000	9000000	9000000	9428678	9694548	9806572	9949963	10000000	10000000	10000000	10000000	10000000
Cumulative TOTAL WATER INFLOWS	m3			8692287	8702020	8714894	9087718	9277316	9355426	9443165	9482745	9494584	9504149	9510761	9517716
Cumulative TOTAL WATER OUTFLOWS	m3			9152157	9152157	9152157	9609628	9686066	9861884	9872387	9922425	9922425	9922425	9922425	9922425
Extreme Rainfall Event															
Depth with 100% runoff all into lake area (2 year return)	m			0.095	0.095	0.095	0.095	0.097	0.094	0.096	0.094	0.095	0.094	0.094	0.094
Depth with 100% runoff all into lake area (5 year return)	m			0.139	0.139	0.138	0.138	0.141	0.137	0.140	0.138	0.138	0.138	0.137	0.137
Depth with 100% runoff all into lake area (10 year return)	m			0.168	0.168	0.167	0.167	0.171	0.166	0.170	0.167	0.167	0.166	0.166	0.166
Depth with 100% runoff all into lake area (20 year return)	m			0.197	0.197	0.196	0.196	0.200	0.194	0.199	0.195	0.196	0.195	0.195	0.195
Depth with 100% runoff all into lake area (50 year return)	m			0.238	0.237	0.237	0.236	0.241	0.234	0.240	0.235	0.236	0.235	0.235	0.234
Depth with 100% runoff all into lake area (100 year return)	m			0.268	0.267	0.267	0.266	0.272	0.264	0.271	0.265	0.266	0.265	0.265	0.264
Depth with 100% runoff all into lake area (200 year return)	m			0.301	0.300	0.299	0.298	0.305	0.296	0.304	0.298	0.298	0.297	0.297	0.296
Depth with 100% runoff all into lake area (500 year return)	m			0.346	0.346	0.345	0.344	0.351	0.341	0.350	0.343	0.344	0.343	0.342	0.341

Appendix B

Background Water Quality

Data from the 2004 results

Water Quality data assume
values at detection limit

Sample ID Parameter	Units	CCME	TAIL LAKE - Outflow											
			Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
pH		6 to 9				7.4	7.6	7.3	7.3	7.3				
TDS	mg/L	0.005				110	120	100	120	120				
TSS	mg/L					3	3	3	3	3				
Free CN	mg/L													
Total CN	mg/L					0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L													
CNO	mg/L													
SCN	mg/L													
Sulphate	mg/L					1.97	2.54	2.05	2.91	2.91				
Chloride	mg/L					29	40	34	37	37				
Total Ammonia	mg/L	0.97				0.005	0.005	0.005	0.028	0.028				
Nitrate	mg/L					0.006	0.006	0.006	0.006	0.006				
Nitrite	mg/L					0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L					25	31	27	25	25				
Ortho -P	mg/L					0.002	0.002	0.002	0.002	0.002				
Phosphate-P	mg/L					0.009	0.005	0.005	0.003	0.003				
Org. Carbon	mg/L					6	7	6	5	5				
Hardness CaCO3	mg/L					33	43	37	38	38				
Total Metals														
Aluminum Al	mg/L	0.1				0.0165	0.0116	0.0457	0.0221	0.0221				
Antimony Sb	mg/L					0.00013	0.00026	0.00058	0.000661	0.000661				
Arsenic As	mg/L	0.005				0.0002	0.00028	0.000241	0.000201	0.000201				
Barium Ba	mg/L					0.00166	0.00193	0.00273	0.00231	0.00231				
Beryllium Be	mg/L					0.0002	0.0002	0.000003	0.000003	0.000003				
Bismuth Bi	mg/L					0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L					0.012	0.015	0.0158	0.0137	0.0137				
Cadmium Cd	mg/L	0.000038				0.000002	0.000002	0.000002	0.000002	0.000002				
Calcium Ca	mg/L					5.18	5.82	7.17	6.59	6.59				
Chromium Cr	mg/L	0.001				0.00037	0.00074	0.000855	0.000109	0.000109				
Cobalt Co	mg/L					0.0001	0.0001	0.0000823	0.000087	0.000087				
Copper Cu	mg/L	0.002				0.0009	0.001	0.000726	0.000714	0.000714				
Iron Fe	mg/L	0.3				0.042	0.034	0.0786	0.0641	0.0641				
Lead Pb	mg/L	0.002				0.00005	0.00005	0.0000717	0.0000102	0.0000102				
Lithium Li	mg/L					0.00337	0.00337	0.00337	0.00337	0.00337				
Magnesium Mg	mg/L					4.08	4.62	5.37	4.49	4.49				
Manganese Mn	mg/L					0.0008	0.0007	0.0023	0.00276	0.00276				
Mercury Hg	mg/L	0.0001				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L	0.073				0.0001	0.00011	0.0000691	0.0000781	0.0000781				
Nickel Ni	mg/L	0.025				0.00052	0.00054	0.000457	0.000397	0.000397				
Phosphorus TP	mg/L					0.009	0.005	0.005	0.003	0.003				
Potassium K	mg/L					1.58	1.73	1.46	1.87	1.87				
Selenium Se	mg/L	0.001				0.0004	0.0004	0.000335	0.000318	0.000318				
Silicon SiO2	mg/L					0.9	0.9	0.9	0.9	0.9				
Silver Ag	mg/L	0.0001				0.0001	0.0001	0.0000005	0.00000413	0.00000413				
Sodium Na	mg/L					15.7	18.8	18.1	18.2	18.2				
Strontium Sr	mg/L					0.0218	0.0269	0.0247	0.0292	0.0292				
Tellurium Te	mg/L					0.05	0.05	0.05	0.05	0.05				
Thallium Tl	mg/L	0.0008				0.00003	0.00003	0.00003	0.00003	0.00003				
Thorium Th	mg/L													
Tin Sn	mg/L					0.0001	0.0003	0.0003	0.0003	0.0003				
Titanium Ti	mg/L					0.006	0.006	0.006	0.006	0.006				
Uranium U	mg/L					0.00005	0.00005	0.00000642	0.00000588	0.00000588				
Vanadium V	mg/L					0.00048	0.00047	0.00018	0.0000152	0.0000152				
Zinc Zn	mg/L	0.03				0.0008	0.0008	0.00224	0.00824	0.00824				
Zirconium Zr	mg/L					0.005	0.005	0.005	0.005	0.005				

Data from the 2004 results

Water Quality data assume
values at detection limit

Sample ID Parameter	Units	CCME	DORIS LAKE - Outflow											
			Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
pH		6 to 9				7.35	7.6	7.6	7.6	7.6				
TDS	mg/L	0.005				140	121.25	125	145	145				
TSS	mg/L					4	5.875	6	7	7				
Free CN	mg/L													
Total CN	mg/L					0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L													
CNO	mg/L													
SCN	mg/L													
Sulphate	mg/L					2.805	2.7125	2.845	2.985	2.985				
Chloride	mg/L					60.5	60.5	58.5	62.5	62.5				
Total Ammonia	mg/L	0.97				0.005	0.008	0.014	0.013	0.013				
Nitrate	mg/L					0.006	0.006	0.006	0.006	0.006				
Nitrite	mg/L					0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L					27.5	25.375	27	26.5	26.5				
Ortho -P	mg/L					0.00075	0.00075	0.00075	0.00075	0.00075				
Phosphate-P	mg/L					0.0165	0.017875	0.024	0.0195	0.0195				
Org. Carbon	mg/L					5.5	5.125	7.5	5	5				
Hardness CaCO3	mg/L					45.5	42.75	42.5	44	44				
Total Metals														
Aluminum Al	mg/L	0.1				0.0332	0.0597	0.0807	0.072133	0.072133				
Antimony Sb	mg/L					0.00036	0.000827	0.002845	0.000458	0.000458				
Arsenic As	mg/L	0.005				0.000471	0.000398	0.000364	0.000363	0.000363				
Barium Ba	mg/L					0.00285	0.00315	0.002995	0.00309	0.00309				
Beryllium Be	mg/L					5.65E-06	0.000003	0.000003	0.000003	0.000003				
Bismuth Bi	mg/L					0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L					0.0344	0.0225	0.02315	0.0223	0.0223				
Cadmium Cd	mg/L	0.000038				2.5E-06	2.5E-06	0.000002	0.000002	0.000002				
Calcium Ca	mg/L					8.47	7.81	7.6	7.313333	7.313333				
Chromium Cr	mg/L	0.001				0.00064	0.000252	0.000455	0.000248	0.000248				
Cobalt Co	mg/L					4.62E-05	0.000135	0.000888	7.48E-05	7.48E-05				
Copper Cu	mg/L	0.002				0.0012	0.00153	0.001262	0.001497	0.001497				
Iron Fe	mg/L	0.3				0.051	0.125	0.0847	0.090367	0.090367				
Lead Pb	mg/L	0.002				1.75E-05	6.08E-05	3.68E-05	3.56E-05	3.56E-05				
Lithium Li	mg/L					0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L					7.3	6.56	6.62	6.476667	6.476667				
Manganese Mn	mg/L					0.0066	0.0208	0.0133	0.010123	0.010123				
Mercury Hg	mg/L	0.0001				6E-07	6E-07	6E-07	6E-07	6E-07				
Molybdenum Mo	mg/L	0.073				0.000157	0.000153	0.000182	0.00016	0.00016				
Nickel Ni	mg/L	0.025				0.000404	0.000568	0.000461	0.000433	0.000433				
Phosphorus TP	mg/L					0.0165	0.017875	0.024	0.0195	0.0195				
Potassium K	mg/L					2.82	2.42	2.405	2.34	2.34				
Selenium Se	mg/L	0.001				0.000898	0.000571	0.000618	0.000556	0.000556				
Silicon SiO2	mg/L					0.5	0.5	0.5	0.5	0.5				
Silver Ag	mg/L	0.0001				8.3E-07	9.85E-07	6.44E-07	6.56E-07	6.56E-07				
Sodium Na	mg/L					39.3	33.1	34.4	32.13333	32.13333				
Strontium Sr	mg/L					0.0406	0.042	0.0358	0.039967	0.039967				
Tellurium Te	mg/L					0.05	0.05	0.05	0.05	0.05				
Thallium Tl	mg/L	0.0008				0.00003	0.00003	0.00003	0.00003	0.00003				
Thorium Th	mg/L													
Tin Sn	mg/L					0.0004	0.0004	0.0004	0.0004	0.0004				
Titanium Ti	mg/L					0.006	0.006	0.006	0.006	0.006				
Uranium U	mg/L					2.48E-05	2.97E-05	3.78E-05	3.12E-05	3.12E-05				
Vanadium V	mg/L					0.00055	4.42E-05	0.000234	0.000138	0.000138				
Zinc Zn	mg/L	0.03				0.0009	0.00316	0.00284	0.001695	0.001695				
Zirconium Zr	mg/L					0.005	0.005	0.005	0.005	0.005				

Data from the 2004 results

Water Quality data assume
values at detection limit

Sample ID Parameter	Units	CCME	Little Roberts Lake - Outflow											
			Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
pH		6 to 9				7.1	7.6	7.6	7.6	7.6				
TDS	mg/L	0.005				150	150	140	160	160				
TSS	mg/L					7	8	4	5	5				
Free CN	mg/L													
Total CN	mg/L					0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L													
CNO	mg/L													
SCN	mg/L													
Sulphate	mg/L					3.77	3.68	4.66	4.44	4.44				
Chloride	mg/L					61	58	57	65	65				
Total Ammonia	mg/L	0.97				0.005	0.005		0.007	0.007				
Nitrate	mg/L					0.006	0.006		0.006	0.006				
Nitrite	mg/L					0.002	0.002		0.002	0.002				
Alkalinity	mg/L					23	23	24	25	25				
Ortho -P	mg/L					0.001	0.001	0.001	0.001	0.001				
Phosphate-P	mg/L					0.024	0.016	0.007	0.019	0.019				
Org. Carbon	mg/L					6	4	7	5	5				
Hardness CaCO3	mg/L					43	38	40	44	44				
Total Metals														
Aluminum Al	mg/L	0.1				0.243	0.114	0.191	0.151	0.151				
Antimony Sb	mg/L					0.000416	0.00171	0.00116	0.00061	0.00061				
Arsenic As	mg/L	0.005				0.000415	0.000318	0.000512	0.000409	0.000409				
Barium Ba	mg/L					0.00508	0.0034	0.00441	0.00415	0.00415				
Beryllium Be	mg/L					6.47E-06	0.000003	4.3E-06	3.85E-06	3.85E-06				
Bismuth Bi	mg/L					0.0001	0.0001	0.0001	0.0001	0.0001				
Boron B	mg/L					0.0292	0.02	0.0281	0.0262	0.0262				
Cadmium Cd	mg/L	0.000038				2.43E-06	3.96E-06	1.45E-05	0.000002	0.000002				
Calcium Ca	mg/L					7.71	6.61	6.69	7.45	7.45				
Chromium Cr	mg/L	0.001				0.000491	0.00003	0.000559	0.000383	0.000383				
Cobalt Co	mg/L					0.000149	0.0003	0.000357	0.000113	0.000113				
Copper Cu	mg/L	0.002				0.00115	0.0013	0.0016	0.00184	0.00184				
Iron Fe	mg/L	0.3				0.278	0.137	0.178	0.155	0.155				
Lead Pb	mg/L	0.002				6.61E-05	4.69E-05	8.91E-05	0.000251	0.000251				
Lithium Li	mg/L					0.00279	0.00279	0.00279	0.00279	0.00279				
Magnesium Mg	mg/L					6.96	5	5.18	7.09	7.09				
Manganese Mn	mg/L					0.0237	0.00845	0.0124	0.00774	0.00774				
Mercury Hg	mg/L	0.0001				6E-07	6E-07	6E-07	6E-07	6E-07				
Molybdenum Mo	mg/L	0.073				0.00018	0.000164	0.000235	0.000196	0.000196				
Nickel Ni	mg/L	0.025				0.000639	0.000492	0.000635	0.000568	0.000568				
Phosphorus TP	mg/L					0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L					2.69	2.17	2.16	2.46	2.46				
Selenium Se	mg/L	0.001				0.00064	0.000365	0.000821	0.000592	0.000592				
Silicon SiO2	mg/L					0.5	0.5	0.5	0.5	0.5				
Silver Ag	mg/L	0.0001				3.21E-06	5E-07	2.89E-06	1.25E-06	1.25E-06				
Sodium Na	mg/L					37.4	31	33.5	36	36				
Strontium Sr	mg/L					0.0441	0.0369	0.039	0.0452	0.0452				
Tellurium Te	mg/L					0.05	0.05	0.05	0.05	0.05				
Thallium Tl	mg/L	0.0008				0.0001	0.0003	0.0003	0.002	0.002				
Thorium Th	mg/L													
Tin Sn	mg/L													
Titanium Ti	mg/L					0.006	0.006	0.006	0.006	0.006				
Uranium U	mg/L					3.51E-05	3.12E-05	3.37E-05	4.21E-05	4.21E-05				
Vanadium V	mg/L					0.000423	9.16E-05	0.000447	0.000284	0.000284				
Zinc Zn	mg/L	0.03				0.00346	0.00166	0.00153	0.0051	0.0051				
Zirconium Zr	mg/L					0.005	0.005	0.005	0.005	0.005				

Appendix C

Nutrient Release from Fish Habitat

Technical Memorandum

To:	Brian Labadie, MHBL	Date:	12 September 2005
cc:	Gary Ash, Golder	From:	John Chapman
Subject:	Doris North Project - Jetty and Fish Habitat Construction Nutrient Release from Blast Residues	Project #:	1CM014.006

1 Introduction

Construction rock will be used to construct the Doris North Project jetty and to establish or enhance fish habitat in Doris Lake and around the jetty area. This technical memorandum presents estimates of blast residue that may be released from the construction rock as it is placed in the bay and in Doris Lake.

2 Calculation Method

The potential blast residue release from the construction rock was calculated following the methods described in Ferguson and Leask (1988). Mine production rates and estimated explosives usage rates provided by MHBL indicated a powder factor of about 1.14 kg per tonne of rock mined. The same powder factor was adopted for the quarrying of construction rock. Conservatively, blast residue content equal to 10% of the powder factor was adopted. Since the construction rock will be fully immersed in water, it was further assumed that all of the blast residue will be released. Therefore, the steps to calculate the release of ammonia and nitrate from the mined rock are as follows:

1. An estimate of the amount of ANFO used in the blasting of each of the waste rock and ore materials was calculated by multiplying the amount of each material by the powder factor.
2. The residual mass of ANFO was then estimated by multiplying the total mass of ANFO used to produce the rock and ore with the overall residue factor (i.e. 10%).
3. The amount of nitrogen in the ANFO was calculated assuming that the ANFO comprises 94% NH_4NO_3 , and 6% fuel oil. The mass weight equivalent of the N in ammonium nitrate is 35%, therefore the total N content of the ANFO is 33%.
4. The amount of nitrogen released from the waste rock in storage was calculated assuming that all of the residual nitrogen will be flushed from the construction fill.
5. The speciation of the nitrogen in the blast residues was assumed to be 28% ammonia, 70% nitrate, and 2% nitrite. In contrast to the recommendations in Ferguson and Leask (1988), this conservatively assumes a higher portion of the nitrogen will be present as ammonia.

3 Results

3.1 Roberts Bay

3.1.1 Jetty Construction

Based on the current design, the jetty will be constructed using approximately 5,600 cubic meters of rock (11,600 dry tonnes). The current proposal for the jetty compensation is to create eight spurs along the jetty each measuring 5 m x 15 m and about 0.5 m in height, for a rock volume of 300 m³ (about 500 tonnes). The total mass of rock that will be placed will therefore be about 12,100 dry tonnes.

It is anticipated that the jetty will be constructed over a 10 day period. During construction, a silt curtain will be maintained around the rock deposition zone.

By assuming that all of the rock will be wetted and thoroughly 'rinsed' during deposition, it is expected that all of the blast residue will be released to Roberts Bay over the period of construction. This is conservative since a proportion of the rock will remain above the water level. The estimated nutrient loadings that may be released from the placement of construction rock are summarized in Table 3.1.

The silt curtain may limit the rate of dispersion of the blast residues during construction. However, wave action and local currents are expected to displace the majority of the water from within the silt curtain area on a daily basis. Assuming that: i) the average water depth along the extent of the jetty is about 2.5 m, ii) the silt curtain is placed at a distance of about 15 meters from the centre-line on both sides of the jetty, and, iii) the silt curtain extends about 15 meters beyond the end of the jetty, daily maximum concentrations that may occur within the silt curtain area, assuming complete release of the blast residues were calculated and are included in Table 3.1.

Table 3.1 Summary of Estimated Nutrient Release to Roberts Bay from Jetty Construction

Parameter	Overall Release (kg)	Daily Release (kg/day)	Average Local* Daily Concentration (mg/L)
NH ₃ -N	50	5.0	0.57
NO ₃ -N	396	40.0	4.50
NO ₂ -N	9.1	0.91	0.10

Note: * Locally within silt curtain.

3.1.2 Additional Fish Habitat Compensation

As well, six additional rock spurs measuring 5 m x 20 m x 0.5 m high, for a rock volume of 300 m³ (about 500 tonnes), will be constructed out from shore somewhere along the bay. All of these are to be underwater, to provide additional rock habitat for fish and invertebrates, so that all of the blast residues will be released from the rock. The estimated nutrient loadings to Roberts Bay from these additional spurs will be as shown Table 3.2 below.

Table 3.2 Estimated Nutrient Loadings from Spurs Constructed for Fish Habitat Enhancement

Parameter	Total Loading (kg)
NH ₃ -N	2.1
NO ₃ -N	16.4
NO ₂ -N	0.4

3.2 Doris Lake Fish Habitat

The proposed fish rearing habitats in Doris Lake would comprise five areas each measuring about 25 m x 25 m and one area measuring about 30 m x 30 m. In each area rock would be placed to a height of between 1.0 m and 1.5 m, depending on the bathymetry of the area. Assuming a height of 1.5 m, the total volume of rock would be about 12,500 tonnes.

These areas will be constructed by simply placing construction rock on the ice at the desired locations during winter. As ice-melt occurs in the spring, the rock will settle to the bottom of the lake to create the rearing habitats.

As the rock-mass settles through the water column the nutrients contained in the blast residues will be released to Doris Lake. The estimated total nutrient loadings to Doris Lake are summarized in Table 3.3. Locally, nutrient concentrations may increase with the lake water column for a short period of time. However, since Doris Lake contains about 26.3 million m³ of water, it is apparent that the net nutrient concentration increase in Doris Lake will be small, as shown in Table 3.3.

Table 3.3 Estimated Nutrient Loadings and Concentrations in Doris Lake Caused by Habitat Construction

Parameter	Total Nutrient release (kg)	Incremental Concentration (mg/L)
NH ₃ -N	52	0.0020
NO ₃ -N	409	0.0160
NO ₂ -N	9.4	0.0004

4 References

Ferguson, K.D. and Leask, S.M., 1988. *The export of Nutrients from Surface Coal Mines*. Environment Canada, Conservation and Protection, Pacific and Yukon Region. Regional Program Report 87-12.

Appendix D

Tailings Water Quality Results

TABLE D-1. DORIS NORTH PROJECT CYANIDE LEACH AND TAILINGS WATER ANALYSES

Source: AMMTEC - Supplied by AMEC

(Data In ppm (mg/l) Unless Stated Otherwise)

ANALYSIS		Float Tails Soln [HS9312]	Cyanide Leach Soln [HS9467]	Cyanide Detoxified Soln [MH3051]	Blended Effluent	Blended Effluent [1 month]
		Dissolved	Dissolved	Dissolved	Dissolved	Dissolved
CN(free)		<5	120	<5	<5	<5
CN(wad)		<0.01	180	0.25	0.04	0.01
CN(total)		0.01	210	2.5	0.29	0.20
CNO		<5	360	400	32	9.1
SCN		0.2	37	0.2	<0.1	0.3
Nitrate (NO ₃) as N		2	ND	8	2	0.8
Ammonia (NH ₃) as N		<1	3	17	1	4.4
NO ₃ ⁻ & NO ₂ ⁻ as N		NA	8	NA	NA	NA
Nitrite (NO ₂) as N		<1	ND	23	1	0.9
pH		7.88	10.63	7.86	8.18	7.95
Free acid, g/l		0	0	0	0	0
Sulphate (SO ₄), g/l		<0.05	0.26	4.05	0.18	0.44
Hardness, mg/l CaCO ₃		290	12.9	1470	409	363
Conductivity, mS/cm		955 µS/cm	4.44	9.38	1.94	1.89
Alkalinity, mg/l CaCO ₃		115	640	435	170	150
Acidity		NA	NA	NA	NA	NA
Total Metals	Al	0.057	0.33	0.11	0.10	0.073
	As	0.006	1.00	0.010	0.008	0.002
	B	0.05	0.06	0.10	0.05	0.34
	Ba	<0.02	<0.02	0.37	0.04	0.04
	Ca	60.4	8.2	411	106	68.5
	Cd	<0.005	<0.005	<0.005	<0.005	<0.005
	Co	<0.005	0.64	0.30	0.040	0.032
	Cr	0.002	0.034	0.24	0.026	0.020
	Cu	0.008	42	0.14	0.039	0.024
	Fe	0.034	5.9	0.17	0.120	0.220
	Hg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	K	11.2	105	1890	182	168
	Mg	14.0	1.5	77.1	22.8	28.2
	Mn	0.058	0.016	0.023	0.12	0.10
	Mo	0.03	0.16	0.08	0.04	0.04
	Na	99.8	863	750	160	162
	Ni	0.01	0.33	0.62	0.03	0.01
	Pb	<0.05	<0.05	<0.05	<0.05	<0.05
	SO ₄	70.2	482	3860	428	433
	V	<0.005	0.042	0.023	0.005	<0.005
	Zn	0.025	1.7	0.37	0.090	0.092
Dissolved Metals	Al	0.010	0.36	<0.005	0.006	0.023
	As	0.007	1.00	0.010	0.008	0.002
	B	0.06	0.08	0.06	0.03	0.09
	Ba	0.009	0.007	0.38	0.04	0.034
	Ca	62.9	7.6	442	104	71.4
	Cd	<0.005	<0.005	<0.005	<0.005	<0.005
	Co	<0.005	0.64	0.49	0.048	0.044
	Cr	<0.002	0.029	0.23	0.023	0.005
	Cu	0.007	46	0.18	0.022	0.009
	Fe	<0.005	6.3	0.12	0.025	0.033
	Hg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	K	10.9	116	2010	175	174
	Mg	14.5	1.5	82.4	23.9	28.9
	Mn	0.059	0.009	0.021	0.13	0.096
	Mo	0.03	0.18	0.08	0.04	0.05
	Na	99.8	888	769	158	167
	Ni	<0.01	0.38	0.77	0.03	<0.01
	Pb	<0.05	<0.05	<0.05	<0.05	<0.02
	SO ₄	73.4	505	4220	439	440
	V	<0.005	0.050	0.024	<0.005	<0.005
	Zn	<0.005	1.8	0.30	0.006	<0.005

TABLE D-2. DORIS NORTH PROJECT CYANIDE LEACH AND TAILINGS WATER ANALYSES

Source : Supplied by AMEC



BC Research Inc., BC Research and Innovation Complex, 3650 Westbrook Mall, Vancouver, BC, Canada V6S 2L2
 Telephone: (604) 224-4331 • Facsimile: (604) 224-0540 • Email: info@bcresearch.com • Website: bcresearch.com

Miramar Doris North Water Samples (Received August 6/03 from Ammtec)

Parameter	Units	Sample 1	Sample 2	Sample 3	Sample 4
pH		10.17	7.70	7.49	7.63
Free CN	mg/L	to come	to come	to come	to come
Total CN	mg/L	220	1.82	0.0109	0.242
WAD CN	mg/L	153	0.181	<0.0005	0.0363
CNO	mg/L	312	282	<1	33
SCN	mg/L	38	0.82	0.45	0.45
Sulphate	mg/L	328	4010	41	355
Total Ammonia	mg/L	2.16	22	0.186	1.14
Nitrate	mg/L	1.32	2.54	1.14	0.735
Nitrite	mg/L	0.052	0.386	0.021	0.116
Alkalinity	mg/L	724	441	116	189
Conductivity	uS/cm	5040	9800	960	1920
Hardness CaCO3	mg/L	10	1320	197	340
Total Metals Analysis					
Aluminum Al	mg/L	0.15	0.005	0.013	0.01
Antimony Sb	mg/L	0.054	0.022	< 0.001	0.003
Arsenic As	mg/L	0.93	0.012	0.006	0.01
Barium Ba	mg/L	0.004	0.35	0.009	0.041
Beryllium Be	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bismuth Bi	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Boron B	mg/L	0.08	0.07	< 0.05	0.06
Cadmium Cd	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Calcium Ca	mg/L	3.37	346	53.6	93.5
Chromium Cr	mg/L	0.025	0.2	< 0.001	0.021
Cobalt Co	mg/L	0.38	0.5	< 0.001	0.044
Copper Cu	mg/L	40.4	0.2	0.013	0.039
Iron Fe	mg/L	3.61	0.18	< 0.05	< 0.05
Lead Pb	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Lithium Li	mg/L	< 0.001	0.016	0.009	0.011
Magnesium Mg	mg/L	0.43	80.3	15.3	26.2
Manganese Mn	mg/L	0.003	0.02	0.049	0.11
Mercury Hg	ug/L	0.19	0.03	< 0.02	< 0.02
Molybdenum Mo	mg/L	0.15	0.068	0.021	0.031
Nickel Ni	mg/L	0.38	0.68	0.009	0.031
Phosphorus PO4	mg/L	1.03	1.64	0.14	0.28
Potassium K	mg/L	113	1700	10.9	182
Selenium Se	mg/L	0.008	0.01	< 0.001	< 0.001
Silicon SiO2	mg/L	15.1	18	16.9	14.9
Silver Ag	mg/L	0.0045	< 0.0001	< 0.0001	< 0.0001
Sodium Na	mg/L	918	730	101	173
Strontium Sr	mg/L	0.018	1.41	0.14	0.33
Tellurium Te	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Thallium Tl	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thorium Th	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Tin Sn	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Titanium Ti	mg/L	0.001	0.004	0.001	0.001
Uranium U	mg/L	< 0.0005	0.0057	< 0.0005	< 0.0005
Vanadium V	mg/L	0.044	< 0.001	< 0.001	< 0.001
Zinc Zn	mg/L	1.53	0.25	< 0.005	0.009
Zirconium Zr	mg/L	< 0.01	< 0.01	< 0.01	< 0.01

Table D-3 Aged Samples Analysed at B.C. Research



BC Research Inc., BC Research and Innovation Complex, 3650 Westbrook Mall, Vancouver, BC, Canada V6S 2L2
 Telephone: (604) 224-4331 • Facsimile: (604) 224-0540 • Email: info@bcresearch.com • Website: bcresearch.com

Miramar Doris North Aged Water Samples (Received Sept 12/03 from Ammtec)

Sample ID		Sample 4 (A8693)
Parameter	Units	Aged 1 month
pH		7.87
Free CN	mg/L	0.01
Total CN	mg/L	0.147
WAD CN	mg/L	0.0139
CNO	mg/L	8.3
SCN	mg/L	<0.2
Sulphate	mg/L	446
Total Ammonia	mg/L	5.31
Nitrate	mg/L	0.331
Nitrite	mg/L	<0.002
Alkalinity	mg/L	161
Conductivity	uS/cm	1518
Hardness CaCO3	mg/L	282
Parameter		Total Metals Analysis
Aluminum Al	mg/L	0.015
Antimony Sb	mg/L	0.003
Arsenic As	mg/L	0.007
Barium Ba	mg/L	0.032
Beryllium Be	mg/L	< 0.001
Bismuth Bi	mg/L	< 0.001
Boron B	mg/L	0.08
Cadmium Cd	mg/L	< 0.0002
Calcium Ca	mg/L	65.3
Chromium Cr	mg/L	0.004
Cobalt Co	mg/L	0.04
Copper Cu	mg/L	0.02
Iron Fe	mg/L	< 0.05
Lead Pb	mg/L	< 0.001
Lithium Li	mg/L	0.009
Magnesium Mg	mg/L	28.8
Manganese Mn	mg/L	0.084
Mercury Hg	ug/L	0.07
Molybdenum Mo	mg/L	0.036
Nickel Ni	mg/L	0.007
Phosphorus PO4	mg/L	0.13
Potassium K	mg/L	175
Selenium Se	mg/L	< 0.001
Silicon SiO2	mg/L	8.27
Silver Ag	mg/L	0.001
Sodium Na	mg/L	165
Strontium Sr	mg/L	0.28
Tellurium Te	mg/L	< 0.001
Thallium Tl	mg/L	< 0.0001
Thorium Th	mg/L	< 0.0005
Tin Sn	mg/L	< 0.001
Titanium Ti	mg/L	< 0.001
Uranium U	mg/L	0.0006
Vanadium V	mg/L	< 0.001
Zinc Zn	mg/L	0.007
Zirconium Zr	mg/L	< 0.01

Dissolved Metals Analysis
0.005
0.003
0.007
0.033
< 0.001
< 0.001
0.08
< 0.0002
61.4
0.005
0.041
0.015
< 0.05
< 0.001
0.009
27.9
0.087
< 0.02
0.037
0.005
0.05
159
< 0.001
8.27
0.0011
153
0.29
< 0.001
< 0.0001
< 0.0005
< 0.001
< 0.001
0.0006
< 0.001
0.006
< 0.01

Appendix E

Shoreline Erosion Calculations

Potential Shoreline Erosion Processes at Tail Lake, Doris North Project, Hope Bay Nunavut, Canada

Prepared for

Miramar Hope Bay Limited

Prepared by



October 2005

Potential Shoreline Erosion Processes at Tail Lake, Doris North Project, Hope Bay Nunavut, Canada

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1 Introduction

1.1 Background

SRK Consulting (Canada) Inc. (SRK) has been working with Miramar Hope Bay Limited (MHBL) since October 2001, on various aspects of the Hope Bay Doris North Project (from here on referred to as the Doris North Project), including completion of a Preliminary Assessment in February 2002 (SRK 2002a), Conceptual Infrastructure and Tailings Impoundment Designs in December 2002 (SRK 200b, c), and a Feasibility Study in February 2003 (SRK 2003a).

MHBL is planning to develop a new underground gold mine at the Doris North Site. The ore will be processed on site and tailings will be deposited sub-aqueously in Tail Lake. The tailings will be contained in Tail Lake with two water retaining frozen core embankments, the South Dam and the North Dam. The water management plan requires that excess water be retained in Tail Lake until it is suitable for discharge to Doris Creek without any adverse environmental effects. As a result, the water level in the lake will first be increased above its natural level, and then decreased to its original elevation to reinstate Tail Lake as a natural flow-through system by breaching the North Dam.

The rising and subsequent lowering of the water level in Tail Lake may result in shoreline erosion and an increased sediment load into Tail Lake. Shoreline erosion could be triggered by thawing of the ice-rich permafrost clays and silts as the water level rises. When the water level lowers, these thawed soils may be especially susceptible to physical erosion by geotechnical failure of steeper slopes and by surface runoff.

This report quantifies the potential shoreline erosion that may occur around Tail Lake, and proposes mitigation measures to ensure that, should it occur, shoreline erosion will not result in adverse environmental effects.

1.2 Methodology

Since there are no standard procedures to quantify the potential for shoreline erosion around lakes located in permafrost environments that are subject to artificially fluctuating water levels, SRK conducted an extensive literature review of case studies where this phenomenon has been observed. From factual data obtained from these case studies a hypothesis has been developed to describe how shoreline erosion does occur under these conditions, and it was subsequently used to quantify the likely potential for erosion at Tail Lake.

Based on this quantification of the likely potential for erosion, a mitigation plan was developed that should prove to be protective of the environment, be proactive, and is not unnecessarily conservative and financially burdening to MHBL.

1.3 Report Structure

Following this general introduction, Section 2 documents a literature review of case studies of shoreline erosion in permafrost environments. These case studies include Russian sites and six Canadian sites. Section 3 describes four site specific permafrost erosion features (both natural and man-made) that are present in the Doris North Project Area. The potential shoreline erosion hypothesis is presented in Section 4, complete with the assumptions and resultant expected shoreline erosion rates predicted for Tail Lake. Section 5 concludes the report with details of an adaptive management plan to prevent and/or mitigate potential shoreline erosion processes.

2 Historic Research

2.1 Russian Experience

Shoreline erosion, resulting from rising and falling of water levels in natural impoundments has been known to occur for a long time. However, it was not until the late sixties, when Russian researchers started documenting specific case studies (Newbury *et al.* 1978), that an understanding of the processes of shoreline erosion was conceived.

The Russians initiated this research because they were concerned about the loss of storage capacity in natural impoundments caused by sedimentation from shoreline erosion in non-permafrost embankment soils (Newbury *et al.* 1978). Their investigations of the shoreline erosion processes led to a broader recognition of the factors that affect shoreline morphology, including the role of the overburden materials and the wave energy impacting the shoreline. These factors were first recognised for reservoirs in Poland in 1973.

It was observed that unconsolidated shoreline materials exposed to wind generated waves would erode the shoreline, and that through this process of erosion and deposition of the shoreline material, in the back- and near-shore zones, a new stable shoreline ultimately developed. Furthermore, it has been observed that if the shoreline materials consisted predominantly of fine grained material (silt and clay); the erosion during this period of stabilization can be intense. The energy of the waves undercuts the shoreline, which then slumps and retreats. The coarser materials settle out as offshore shoals, whilst the fines are held in suspension and circulated throughout the water body.

This research culminated in Kondratjev (1966) (*as per* Newbury *et al.* 1978) developing a “*generalized terminal form*” (model) for shoreline erosion in the USSR. This model states that an eroded backshore platform develops with a stable foreshore depositional shoal that dissipates incoming erosional wave energy.

Around the same time, another researcher, Kachugin (1966) (*as per* Newbury *et al.* 1978) evaluated the impact of wave energy on shoreline morphology, and developed a “*wash-out*” coefficient, which has units of cubic meters of eroded soil per ton-meter of wave energy (Newbury *et al.* 1978).

Insofar as tools for understanding and predicting shoreline erosion processes resulting from the rising and falling of water levels associated with natural impoundments in non-permafrost soils, these two models are the current state-of-the art; but are not particularly useful in their current form.

2.2 Canadian Experience

Limited information exists for older Canadian reservoir shorelines in unfrozen erodable material. However, a cursory review by Newbury *et al.* (1978) suggested that the Kondratjev model does apply.

A large number of Canadian reservoirs are located in the sub-arctic climatic zone of Canada, where widespread discontinuous permafrost is present. Newbury *et al.* (1978) document that little research has been done on shoreline erosion processes under these conditions. From the limited anecdotal information that is available, it would appear that the process of shoreline formation in flooded impoundments, where permafrost is present, is a combination of erosive and thermal phenomena.

Newbury and McCullough (1984) document the first and only scientific case study of shoreline erosion in permafrost soils at the Southern Indian Lake Reservoir in northern Manitoba, Canada. They stipulate that the rate of shoreline erosion in open water bodies is dependent on the onshore wave energy, the resistance of the shoreline materials to the drag forces exerted by the waves and return flows, and the configuration of the shoreline and offshore zone (i.e. shoreline morphology).

Furthermore, they stipulate that the time required establishing the long-term stable form of the shoreline depends on the erosion rate and the characteristics of the eroding material.

Although Newbury and McCullough (1984) present scientific data to support their findings at the Southern Indian Lake, they do not present a transferable model that can be used to predict shoreline erosion at other impoundments.

2.3 Case Studies

A review of the current state-of-the art with respect to finding an appropriate scientific method to predict shoreline erosion, failed to identify such a tool (see preceding sections). SRK therefore opted to find additional Canadian case studies which could be evaluated critically with the hope of developing a hypothesis for shoreline erosion. This hypothesis could then be used to predict shoreline erosion at Tail Lake.

The following sections of this report contain summary discussions of a few relevant case studies. Where appropriate, these case studies are discussed in sufficient detail to allow a comparison of the conditions leading to shoreline erosion with the conditions at Tail Lake.

2.3.1 Case Study #1: Southern Indian Lake Reservoir, Manitoba

Site Description

Newbury and McCullough (1984) present the results of the first and only documented case study of shoreline erosion in permafrost soils associated with a rising water level. The Southern Indian Lake water level in northern Manitoba, near the town of Thompson, was raised 3 m in 1976 (i.e. total water level increase occurred in one season). Prior to raising the water level, the lake had a surface area of 1,930 km², and the natural water level fluctuation was approximately 1.5 m. Post flooding, the lake covered 2,530 km² and exposed 2,900 km of shoreline.

Monitoring Plan

Prior to raising the water level, 38 cross-sections of the backshore, beach and foreshore zones were surveyed, and the material properties sampled and analysed for grain size distribution and ice content. After the water level was raised, annual surveys of these sections were conducted as well as soundings in the lake at each section up to a water depth of 4 m.

Site specific wind data were recorded and on-shore wave energies were determined at each section, such that the net volume of eroded soils at each section could be divided into the incident wave energy to obtain a gross erosion index for each site. Subsequently, a dry mineral soil erosion index was determined by subtracting the peat, water, and ice content from the volume eroded between surveys. This data collection was continued for a period of four years.

Shoreline Soil Properties

Newbury and McCullough (1984) present data for only 20 of the 38 surveyed sections, and of those 20 sites, only 14 sections were located in fine-grained material. The fine grained material ranged from 0 to 9% sand, 15 to 49% silt and 51 to 85% clay, with the ice content varying from 43 to 92% (six samples only). No plasticity results were reported.

The depth to permafrost at the end of the summer season ranged from 50 cm to 140 cm, depending on the surface cover. Permafrost temperature was not measured; however, based on the Mean Annual Ambient Air Temperature (MAAT) for Thompson, Manitoba of -3.3°C (http://www.climate.weatheroffice.ec.gc.ca/climate_normals), it would be reasonable to assume that under the good thermal protection of an organic layer, warm permafrost temperatures around -1°C would have been likely.

Erosion Process

It is reported that the erosion of frozen fine-grained materials on the shorelines of the larger basins of the lake (average fetch of 6.4 km) was observed to proceed in a repeated sequence of cutting, slumping and removal. As the ice pockets and lenses melted, the bank material became oversaturated and formed a slurry. The partially thawed materials flowed out and formed silty-clay beaches strewn with scattered frozen blocks. These materials were completely removed during storms in areas of high wave energy.

Peat covered backshore sections were observed to melt below and slightly above the water level. Often caverns or melt niches developed under the frozen backshore material, which ultimately collapsed onto the foreshore. The collapsed material was subsequently removed by wave action.

If bedrock was encountered at the eroding face, erosion of the water level ceased.

Newbury and McCullough (1984) concluded that the dominant erosion and sediment release process at Southern Indian Lake was essentially mechanical erosion due to wave action, and that thermal

erosion probably played an insignificant role, and in fact, may even have improved the conditions, due to the frost adding strength to exposed slopes.

Erosion Rate

Coring of the flooded foreshore materials as well as sediment budgets, confirmed that most of the eroded materials was deposited within 300 m of the shoreline, and only a few percent of the eroded materials were carried into the main water mass in suspension.

Newbury and McCullough (1984) calculated a mean erosion index for the frozen fine-grained soils, which was half of that reported by Kachugin (1966) (*as per Newbury et al. 1978*) thus suggesting that permafrost soils may retard erosion.

The average rate of shoreline erosion reported by Newbury and McCullough (1984) was 4.6 m³/m of shoreline, and after correcting for ice content at 58% by weight, organic content (values not recorded) and an assumed dry bulk density of 2,600 kg/m³, they report the total dry mineral soil erosion loss as 1.08 m³/m of shoreline for the fine grained soils.

A limitation of the work reported by Newbury and McCullough (1984) is the fact that they do not present the geometry of each surveyed section as a function of the erosion loss. The only section that they illustrate is for a high wave energy site, which experienced the most significant erosion loss (4.6 m³/m of shoreline dry mineral soil). This cross-section showed that the original foreshore slope was 9.5° (1V:6H) and the backshore slope was 14.4° (1V:3.9H), and rose more than 5 m above the original lake water level. The new foreshore was again stabilizing at a 9.5° slope, after the water level rose, whilst the backshore was actively being eroded.

Although not reported, it is conceivable, based on the available data, that shoreline erosion is significantly impacted by geometry, and that the greater the slope variance between the foreshore and backshore slopes, and the height of the embankment, the greater the potential for erosion. The reason for this would be the greater vertical resistance that the shoreline presents to the incoming waves, i.e. if the backshore slope was flat, the wave energy would be dissipated over a larger surface area.

Shoreline Stabilization

Newbury and McCullough (1984) finally conclude that shoreline stabilization will only happen once pre-flooding shoreline conditions are established. Prior to flooding of the Southern Indian Lake, the shoreline was 76% bedrock controlled, and at post flooding, this was reduced to 14%. Based on this observation, the researchers concluded that shoreline stabilization would take approximately 35 years, or until the year 2011.

No follow-up research has been done; however, interest groups continued to report on progressive erosion in 2003 (<http://www.justenergy.org/images/indianlake>). All the erosion examples at this time however, coincide only with the steep banks impacted by the high wave energy cross-section as

presented by Newbury and McCullough (1984), and it is possible that other zones may have stabilized.

2.3.2 Case Study #2: Discovery Mine Borrow Pit, Northwest Territory

Site Characterization

A silty clay borrow pit was developed in permafrost soils at the Discovery Mine, 85 km north of Yellowknife, Northwest Territories, Canada, during the winter seasons of 1999 and 2000.

Prior to the development, the borrow source was characterized with ten drill holes. Based on borehole logs and air photo interpretation, the material has been classified as a glaciolacustrine soil unit. Visible ice in the upper 2 m was typically reported in the range of 20 to 40% and occasionally in the range 50 to 60%. Below 2 m depth, the ice content was typically 2 to 10%. Occasionally near the base of the drill holes, ice content increased to 20 or 30% (BGC 2004a, b).

The average moisture content was determined to be 35%, which was 16% higher than the average plastic limit. The average gradation was 2/3 silt and 1/3 clay (i.e. substantially less clay than the Southern Indian Lake shoreline soils). Based on the Atterberg Limits, the material was reported to behave as clay, since most of the samples plotted as a low plastic clay or silt, or as intermediate plastic clay (BGC 2004a, b).

SRK is not aware of permafrost temperatures being recorded; however, based on the assumption that the MAAT at Yellowknife is -4.6°C (http://www.climate.weatheroffice.ec.gc.ca/climate_normals), and at the Colomac Mine, approximately 100 km northwest of Discovery, the MAAT is estimated at -7.6°C (Noël 2004), the permafrost temperatures under good thermal insulation is likely to be in the -1°C to -3°C range at Discovery Mine.

Erosion Processes

The pit was developed by stripping the organic peat cover, and excavating into the silt and clay. No pit rehabilitation was done and thermal erosion started during the first summer that the pit was exposed. Snowmelt and summer rain filled the pit, which had no outlet. This introduced an additional heat source to the exposed ice-rich permafrost in the pit. Thaw settlement subsequently occurred, which resulted in tension cracks around the pit perimeter. Surface water could enter these cracks, which in turn added heat, and subsequently, erosion gulleys transporting silt was developed leading into the pit.

In addition, wave action resulted in shoreline erosion which undercut the 50 cm high settlement banks, and subsequently collapsed into the pit releasing more sediment. It was also concluded that as permafrost beneath the pit thawed, additional silt and clay were released into the pit. As the pit continued to fill with water, it eventually reached an overflow level and turbid water was released into an adjoining lake (Cassie 2004).

In contrast to the Southern Indian Lake case study, BGC concluded that the dominant erosion and sediment yield process at Discovery Mine was associated with thermal erosion which led to thaw-settlement. Mechanical erosion due to wave action was not considered to be significant, although it contributed to lake turbidity.

Erosion Rate

Progressive erosion since 1999 has regressed the borrow pit and bedrock is likely to be intercepted around approximately 70% of the pit perimeter (Cassie 2004). The remaining 30% of the perimeter does not have shallow bedrock and continued progressive erosion is expected in the ice-rich soil until the natural pit slope reaches a stable angle (BGC 2004c), which is likely to be approximately 11° for a thawing slope (13° for a thawed and saturated slope).

It was estimated that without any reclamation, erosion in the ice-rich material would continue at a rate of 0.01 to 0.04 m/m, and that by re-vegetating the slopes, the sediment yield will be reduced by 90 to 95% (BGC 2004c).

SRK converted the predicted erosion rate to units consistent with that reported by Newbury and McCullough (1984) for the Southern Indian Lake. This was done by assuming that the slope length per meter of shoreline impacted by erosion would be approximately 8 m. Correcting that soil mass for a organic layer 30 cm thick, ice content of 48%, and a dry mineral soil bulk density of $2,700 \text{ kg/m}^3$ (dry bulk density of clay soil according to Andersland and Ladanyi (2004)), the total dry mineral soil erosion loss at Discovery Mine computes to 0.04 to $0.15 \text{ m}^3/\text{m}$ of exposed shoreline.

This means that the predicted erosion rate at the Discovery Mine borrow pit would be only 14% of that observed for the Southern Indian Lake, suggesting that the reduced wave action, lower clay content, slightly colder permafrost conditions, and the different physical morphology significantly impact the erosion rate.

Shoreline Stabilization

Three reclamation options were proposed in 2003. The first entailed re-vegetating the slopes, and while such vegetation is allowed to establish, active water management will be done through pumping and treating. It was estimated that this option would require a site presence of up to ten years.

The second reclamation alternative entailed draining the lake and lining all pit slopes with geotextile and rip-rap. The final reclamation alternative entailed construction of a rock fill dyke across the pit, dividing the pool in two, such that wave action in the pond can be limited (BGC 2004c).

Based on trial re-vegetation success in 2003, the final reclamation plan that has been put in place for the borrow pit, to stabilize the slopes and stop the thermal erosion, entails re-establishing natural vegetation, supplemented by selective re-grading of excessively eroded gulleys and placement of rip-rap.

It is estimated that stabilization will take three to five years, during which time maintenance may be required, and active water management through pumping and treating will continue. At that time additional silt loads should not enter the borrow pit and water would be allowed to naturally discharge.

2.3.3 Case Study #3: Garrow Lake, Polaris Mine, Nunavut Territory

Site Characterization

Deep tailings disposal (sub-aqueous) was done in Garrow Lake, at the Polaris Mine on the southern tip of Little Cornwallis Island, Nunavut, Canada. Tailings deposition started in 1981, and by 1985 water quality concerns in the lake resulted in the decision to impound the lake. A 195 m long, 8 m high frozen core dam was subsequently constructed across Garrow Creek, approximately 600 m downstream of the original outlet to Garrow Lake in the winter of 1990/91.

After completion of the dam, the water level in Garrow Lake steadily rose from 1005.6 m (lake level prior to impoundment) to 1008.8 m (approximately 1.4 m below the dam FSL of 1010.2 m). This constitutes a water level rise of approximately 3.2 m over a period of five years. Between 1995 and 2002, when the mine was closed, the water level in Garrow Lake was kept relatively constant at 1008.8 m through annual discharge (EBA 2001).

From 2001 to 2004, the water level in Garrow Lake was steadily lowered to its original level, and the dam was breached in 2004.

Shoreline erosion and associated increased turbidity was never an issue of concern at Garrow Lake (Donald 2004). It can be speculated that the reason for this could be;

- The lake surface remains frozen for eleven months of the year, which means that there is limited wave action (potentially the lake would have an average fetch of 1.6 km).
- The shoreline materials appears to consist of a very thin layer of organics overlying weathered ice-saturated shale (20 to 30% ice content) over more competent shale bedrock (EBA 2001). Thaw settlement potential is therefore low, and not much is available for transport by wave action.

Erosion Rate

SRK has not been able to confirm exactly what the shoreline foundation conditions are at Garrow Lake, so comparisons with the other case studies are difficult. It is however known that the MAAT at Garrow Lake is -14.2°C (EBA 2001) and thermistor data confirms that cold permafrost of -13°C exists. This may have contributed towards slowing down the thaw rate, such that thaw settlement would be reduced.

2.3.4 Case Study #4: Aishihik Lake, Yukon Energy Corporation, Yukon Territory

Aishihik Lake is one of three lakes that have been dammed as part of the Aishihik hydroelectric facility, located about 110 km north of Whitehorse, Yukon Territory. This facility was constructed in 1975 by the Northern Power Commission (NPC), and taken over and managed by Yukon Energy Corporation (YEC) since 1987 (YEC 2005). A water storage control structure has been constructed at the outlet of Aishihik Lake and the water level fluctuates between 0.8 and 1.8 m every year. The lake surface area is about 146 km², and has a shoreline length of about 153 km (World Lakes Database 2005).

The geology of the area is typical of glaciated terrain with glacio-fluvial and morainal material present in valleys and along mountain flanks. Rock type generally includes granodiorite, quartz diorite and granite (Yukon Geological Survey 1994). Aishihik Lake lies in an area of discontinuous but widespread permafrost. The permafrost is non-saline and warm (-0.3°C to -0.4°C) (Personal communication with Mr. Cord Hamilton, P.Eng., YEC). Permafrost with up to 40% volume of ice is common in well-sorted silt and clays along the north shore of Aishihik Lake (YGS 1994). Along the lake shoreline permafrost related mass movements such as detached slides, creep and solifluction are possible, particularly on north facing slopes at high elevations. There are examples of ice-rich deposits undercut by stream or wave erosion, which are actively slumping.

There are numerous press releases and other reports that state that the artificial raising of the lake has resulted in significant erosion of these permafrost soils, and that has led to significant siltation in the northern end of the lake. The World Lakes Database (2005) states that significant shoreline erosion took place during early stages of the reservoirs life, but data do not exist to state if such conditions have continued, although reports suggest that slopes are stabilizing.

Prior to constructing the reservoir, the NPC did acknowledge that shoreline erosion may occur, and a geomorphological study was initiated to characterize the lake shoreline, such that erosion prone areas could be identified. This study, which was done through air photo interpretation, concluded that sections of the shoreline consisting of bedrock or till would not be subject to shoreline erosion, but that sections covered in glaciolacustrine clays, or steep slopes with ice-rich permafrost would be subject to erosion. At the time, the study did not attempt to characterize the extent of potential erosion, nor was any mitigative measures proposed. There were some studies on wave action and maximum wave heights; however, those were used to calculate dam freeboard heights, and not used to evaluate shoreline erosion potential (Personal communication with Mr. Cord Hamilton, P.Eng., YEC).

There are many conflicting statements regarding the magnitude of shoreline erosion at Aishihik Lake as a result of artificially raising the water level. However, since there have been no factual studies or research conducted to specifically evaluate the extent, magnitude, mechanisms or processes involved in shoreline erosion, the case study is not of particular use, as a comparison to Tail Lake. There does however appear to be consensus that after the lake water level was raised, lake water turbidity (and total suspended solids) increased along the northern portion of Aishihik Lake, and the reason appears

to be shoreline erosion of ice-rich permafrost soils. What is not clear is exactly how this erosion has been propagated over time, at what rate, and whether it has naturally stabilized.

2.3.5 Case Study #5: Bigspruce Reservoir, Northwest Territory

The Bigspruce reservoir represents the main storage system of the four hydroelectric generating stations on the Snare River, about 140 km north of Yellowknife, NT. Bigspruce reservoir (formerly Bigspruce Lake) is the northernmost water storage facility, and the dam in the Snare River, near the Snare Rapids (Snare Rapids Hydroelectric Station) causes an artificial fluctuation of the water level. Bigspruce reservoir is about 130 km² in size (NTPC 2005; Rescan 2000).

Most of the Snare River descends through the rugged and lake-filled Precambrian Shield and lies just to the south of the continuous permafrost line. The majority of the lake is bounded by bedrock, and therefore the potential for shoreline erosion is limited. There are conflicting reports that the artificial water level fluctuations has resulted in shoreline erosion which has in turn resulted in increased turbidity and total dissolved solids concentrations in the reservoir. The only factual information that exist about this is a biological characterization study of the Snare River System (Rescan 2001) which states that the water quality in Bigspruce reservoir is good, suggesting that shoreline erosion is perhaps not of concern.

Representatives of Northwest Territories Power Corporation (NTPC) are not aware of any problems of shoreline erosion in Bigspruce reservoir. They state that if there were significant problems they would surely have been aware of it since the reservoir is frequented by canoeists during the summer (Personal communication with Mr. Holger Hartmaier, P.Eng., BGC). Bigspruce reservoir forms part of an official 350 km long canoe trail stretching from Fort Enterprise on Winter Lake to the community of Fort Rae, and SRK is not aware of reports of shoreline erosion or water quality impacts being reported (NT 2005).

Based on the lack of factual information available with regard to potential shoreline erosion at Bigspruce reservoir, there is not enough information to make this case study useful.

2.3.6 Case Study #6: Cross (Pimicikamak) Lake, Manitoba

Manitoba Hydro operates the Churchill-Nelson Hydroelectric Project in Manitoba. This project covers both the Churchill and Nelson River catchments, and amongst many lakes include the Southern Indian Lake (on the Churchill River), and Cross Lake (on the Nelson River). The flow control structure at Jenpeg (at the northern end of Lake Winnipeg) causes the water level in Cross Lake to fluctuate such that the lake area varies between 115 km² and 230 km². The fluctuation of about 3.7 m is however as a result of lowering the water level in Cross Lake, i.e. about half of the original lake is not flooded for a portion of every year, exposing the lake bed sediments (McCullough Research, undated).

According to many sources, significant shoreline erosion has taken place in Cross Lake as a result of this artificial lowering and rising of the water level (The United Church Observer 2000; The

Manitoba 2002; University of Wisconsin Eau Claire 2005; Saturday Free Press 1999a, b; The Drum 1999; Grass Roots News 1999). Most reports state the cause of poor water quality and loss of aquatic life in the lake as shoreline erosion caused by melting permafrost. Some press releases even suggest that as the shorelines continue to erode, the surrounding boreal forest is being destroyed, and with the loss of trees, shoreline erosion continues to expand aerially. Whilst it is undeniable that shoreline erosion exist in the Nelson and Churchill River Systems (Environment Canada 2000), there are no factual studies regarding the erosion processes that are of any use in developing an understanding of how shoreline erosion is occurring (other than the Southern Indian Lake work reported earlier on in this report). Furthermore, SRK is of the opinion, that as far as Cross Lake is concerned, shoreline erosion as a result of melting permafrost is likely not the reason for water quality concerns in Cross Lake. The water level does not fluctuate above the historic high water level in the lake, and therefore new shoreline is not subject to thermal erosion. However, since the lake level is lowered to below its original elevation, the exposed lake bed sediments will be subject to overland surface runoff, which could result in erosion gulley developing, which in turn may affect the water quality in the lake. Alternatively, the lake sediments that have been deposited below the depth of wave action will have become susceptible to re-suspension when the water level was lowered. It could in fact be the sediment released from the lake bed that could be the primary source for suspended solids.

Considering the quality of information available for Cross Lake shoreline erosion, it is not an appropriate case study to use in developing an understanding of shoreline erosion processes at Tail Lake.

2.4 Other Relevant Research

There has been extensive research into overland and shoreline erosion associated with freeze-thaw effects (recent examples include; Gatto 1995; Gatto and Ferrick 2003). This research does however not apply directly to the shoreline erosion phenomena associated with a rising or lowering water level, as it pertains more to the physical desiccation phenomena of soils subject to freeze-thaw cycles, as opposed to thawing soils only.

It is however worthy to note that a failing slope, whether it is due to wave induced energy or due to freeze-thaw processes does share some similarities, especially when considering final slope stabilization and remediation techniques.

Generally, slope failures result in a deposit of material at the toe slope, which if not removed, does become a toe buttress, which ultimately protects the slope from further progressive failure. As illustrated in the Southern Indian Lake case study, the natural buttress is removed continuously by wind induced waves, which results in the progressive nature of shoreline erosion (Newbury *et al.* 1978).

The most logical slope reclamation technique is thus to protect this bank of slumped material at the slope toe, whether this material is subject to freeze-thaw or other geotechnical processes that threaten

to move the material. Low-cost and biotechnical toe protection approaches using native vegetation that is tolerant to shoreline conditions are therefore the preferred remediation technique (Gatto 1995).

Burn (undated) state that the most active landform related to permafrost is thaw slump. Thaw slumps result from disturbance of permafrost generally caused by shoreline erosion. Wave action erodes the shoreline and exposes permafrost, which melts due to the heat introduced by water. The ice-rich soil turn almost liquid, flows away as mud, and the soil above and around it slumps. When the waves wash away the mud and expose more permafrost, the slumping continues. Burn (undated) states that the long-term retreat of the Yukon coastline, at between two and ten meters a year, is due to this process. In other areas, where erosion is less constant, the build-up of mud or surface material will often cover the permafrost and eventually the slumping process.

3 Natural Permafrost Erosion in the Doris North Project Area

3.1 Permafrost Features

3.1.1 Site Location

In an attempt to glean site specific data, which may be used to characterize the conditions at Tail Lake, SRK investigated four permafrost erosion features in the Doris North Project area. These areas were first identified in the regional air photo interpretation (SRK 2005a), and consisted of three man made erosion features associated with the old Roberts Mining Company (RMC) silver mine, north of the Roberts Lake outflow, and one natural erosion feature (Figure 1, Attachment 1).

A detailed field memorandum documenting the field observations complete with maps, photos and laboratory characterization data for four samples collected during the field study is included as Attachment 1; however, the primary conclusions are re-iterated here, together with some additional interpretations.

3.1.2 Soil Conditions

Four representative samples of the eroding ice-rich fine grained soils were collected and tested, confirming that the ice content ranged between 34 and 61%, sand content ranged between 2 and 28%, silt content ranged between 46 and 67%, clay content ranged between 11 and 31% and the plasticity index ranged between 4 and 14%. These soils therefore act as low to medium plasticity clays and silts.

3.1.3 Erosion Processes

Mining activities was carried out at the RMC silver mine during the seventies, and the remnants of activity are still present in the form of buildings and markings on the permafrost associated with vehicular traffic. Three erosion features in the vicinity of the RMC silver mine appear to have been instigated by human activities associated with damage to the protective tundra heath vegetation layer over the permafrost in areas where vehicles travelled.

On-site evidence suggest that prior to human activity, the erosion features were not present, and that catchment runoff flowed down the valley in a diffuse sheet flow pattern, such as observed at Tail Lake. However, as the protective vegetation was damaged, summer permafrost degradation occurred, which led to thaw-settlement of the underlying ice-rich silt and clay. This initial thaw-settlement exposed more ice-rich soil and subsequently thermal erosion continued to expand creating the 3 to 5 m deep gulleys visible today.

The lack of sediment in the gully base, and the presence of a shallow delta at the toe of two of the gulleys confirm that sediment transport takes place, probably as a result of flow concentration during the peak freshet period. There is however no depositional delta visible in Roberts Lake, which is approximately 100 m downstream of the terminus of one of the erosion gulleys, which suggest all sediment probably settle out prior to reaching the lake.

Widespread active natural permafrost degradation is present along the deeply incised shoreline slopes of the Lower Windy Creek (Area 3 on Figure 1, Attachment 1). The mechanisms of erosion appear to be freeze-thaw related. These slopes appear to be sufficiently active to resist natural re-vegetation and stabilization of the 15 to 25° eroding slopes. Flow in the creek is fast, and any sediment is rapidly transported downstream. No sediment plume has ever been documented at the stream outlet in Roberts Bay, and air photography, confirm that there is only a small localized outwash delta, suggesting that all sediment settle out rapidly.

Essentially, observation of the existing permafrost features in similar soils to those observed around Tail Lake; confirm that if the ice-rich fine grained soils are allowed to thaw, and thaw-settlement occurs, then successive erosion is likely to continue, with sediment transport through flow concentration. The evidence however also suggests that sediment will settle out rapidly, and therefore suspended sediment loads are expected to be small.

3.1.4 Erosion Rate

SRK used the air photographs and our own field observations to estimate the volume of erosion loss that had occurred in the three areas around the RMC silver mine (Areas 1 to 3 on Figure 1, Attachment 1). These erosion loss estimates assume that the surface was 100% undisturbed prior to the start of RMC silver mine operations in the late seventies.

Correcting this volume of soil for ice (48%) and peat content (30 cm thick peat layer), the equivalent amount of annual dry mineral soil erosion loss at these sites equates to 0.14 m³/m of shoreline, or in this case exposed gully slope. This amount is consistent with the upper range estimated for the Discovery Lake borrow pit.

3.2 Roberts Bay Analogy

Roberts Bay, located approximately 5 km north of Tail Lake is a shallow bay on the Arctic Coastline. Detailed shoreline characterization confirms that the bay sediments and shoreline materials consist of similar materials to those observed around Tail Lake (Golder 2005; SRK 2005b). It is therefore worthwhile to investigate if there can be some analogy drawn from the Bay shoreline, as to what may happen as Tail Lake is flooded.

Wind and wave action in Roberts Bay is substantially different than at Tail Lake. The maximum fetch in Roberts Bay is 17 km, which is about five times the maximum fetch in Tail Lake. This result in significantly larger wave heights occurring in Roberts Bay, and therefore the potential energy impacted on the shoreline is much greater than in Tail Lake.

There is no physical evidence of any active shoreline erosion taking place in Roberts Bay (Golder 2005). Background water quality sampling has recorded a maximum total suspended solids concentration in the Bay of 17 mg/L; however, this was a single high value recorded in the Bay and was attributed to local bed sediment re-suspension as opposed to shoreline erosion. This bed re-suspension is likely to occur in the Bay, since the entire southern section of the Bay has a shallow (less than 2 m deep) shelf of marine sediments extending up to 100 m out into the Bay.

Roberts Bay is therefore not a good natural analogy to use in developing an understanding of the potential shoreline erosion processes at Tail Lake.

4 Potential Tail Lake Shoreline Erosion and Sediment Yield

4.1 Approach

It is clear that there are no readily available tools with which to determine the rate and magnitude of shoreline erosion and sediment yield associated with rising and lowering the natural lake level in permafrost terrain. Furthermore, the conditions at case studies where this phenomena has been investigated, differ from those found at Tail Lake, both in terms of slope morphology and wave energy, and as such the case study observations may not be readily applicable.

The following sections describe the conditions at Tail Lake, as compared to those in the documented case studies and the natural permafrost features in the Doris North Project area. This information is used to develop a hypothesis with which to predict shoreline erosion rate and magnitude at Tail Lake.

4.2 Shoreline Characterization

It is conceivable that shoreline erosion, and associated sediment release into Tail Lake may occur, as the water level in Tail Lake is elevated up to 5.2 m over a period of five years or more (SRK 2005b, c).

Air photo interpretation and geotechnical drilling (SRK 2005b) confirmed that the soils surrounding Tail Lake are predominantly ice-rich marine silt and clay. Depth to bedrock is up to 10 m, and the ice-rich silt and clay ranges in thickness between 2 and 9 m. Sand deposits are often found sandwiched between the surface silt/clay layer and bedrock.

Eight fine grained samples were characterized and showed sand contents ranging between 3 and 16%, silt contents between 58 and 79%, clay contents between 12 and 37%, and ice contents of between 22 and 76%. Atterberg Limits confirm an average plasticity index of 12.3 (range of 6 to 16). This confirms that the soil will act as inorganic clay and silt with low to medium plasticity.

In addition, clay mineralogy was performed on two samples of the clay fraction (SRK 2005b), confirming that 24% of the clay sized fraction consist of clay minerals, of which 12% is an illite-smectite mixed layer clay (with the smectite layers comprising 10% of that), 58% consist of illite and mica and the remaining 30% is chlorite.

Three thermistor strings were installed in six shoreline drill holes (SRK 2005b), and data confirms the presence of cold permafrost (-8°C) in these soils, which is consistent with the ground temperature measured throughout the site (SRK 2005b).

The current Tail Lake shoreline is approximately 8.2 km long, and approximately 19% is bedrock controlled. The remaining shoreline consists of the marine silt and clays. On the existing shoreline, approximately 45% of the silt and clay slopes are less than 6° (1H:9.5V). Once Tail Lake reaches the Full Supply Level (FSL) of 33.5 m, the exposed shoreline will increase to 8.8 km, of which 41% will be bedrock controlled (including the two dams), and 34% of the shoreline will be on slopes flatter than 6° . The total surface area that will be flooded is approximately 50 ha (10 ha of which is exposed bedrock), of which 76% will consist of slopes flatter than 6° .

Air photo interpretation clearly shows that most of the Tail Lake catchment has been subjected to solifluction. Solifluction is considered to be a form of flow landslide (McRoberts and Morgenstern 1974) which is described by various different nomenclatures. Irrespective of these varying nomenclatures, solifluction in the context of geotechnical engineering is a type of mass movement common to cold regions.

A common feature of solifluction is instability at low angle slopes, and a case study in England illustrated that solifluction failures can occur in slope angles as low as 3 to 7° (McRoberts and Morgenstern 1974). Andersland and Ladanyi (2004) also report that solifluction could occur in slopes as flat as 4° .

4.3 Predicted Erosion Rate

4.3.1 Corrections for Wave Energy

The work by Newbury and McCullough (1984) showed that there is a linear relationship between wave energy and erosion rate. The potential wave energy at the three sites (South Indian Lake, Discovery Mine and Tail Lake) is distinctly different. The wave energy at Southern Indian Lake was driven by an average fetch of 6.4 km. At Tail Lake, the maximum fetch would be the distance between the North and South Dams, which is 3.2 km. The average fetch in Tail Lake is, however, less than 500 m. The maximum fetch distance at the Discovery Mine borrow pit is 400 m, and the average fetch is probably less than 200 m.

Actual wind induced wave energies have not been measured for Tail Lake or Discovery Mine; however, empirical relationships exist between fetch length, wind velocity and wave heights (U.S. Department of the Interior 1987). Based on these empirical relationships, the average wave height at Tail Lake, using a fetch of 1,000 m (increased by a factor of 2, as a factor of safety) would be smaller than at Southern Indian Lake for sustained wind speeds from 80 to 160 km/hr. Similarly, the smaller fetch distance at Discovery Mine would yield wave heights smaller than at Tail Lake. Table 1 summarizes these results.

Table 1: Summary of wave energy correction applied to shoreline erosion

Site	Fetch (km)	Wave height (ft)			Average Fraction of South Indian Lake
		@ 80 km/hr	@ 120 km/hr	@ 160 km/hr	
Discovery Mine	0.2	0.70	0.70	0.80	0.60
Tail Lake	1	0.77	0.84	0.91	0.69
South Indian Lake	6.4	1.07	1.23	1.37	1.00

Based on the measured average soil erosion rate of dry mineral soil at Southern Indian Lake of $1.08 \text{ m}^3/\text{m}$ of shoreline, a wave energy induced corrected erosion rate at Tail Lake can be calculated as $0.75 \text{ m}^3/\text{m}$ of shoreline, and at Discovery Mine the corrected erosion rate would be $0.65 \text{ m}^3/\text{m}$ of shoreline (*i.e.* $1.08 \text{ m}^3/\text{m} \times 0.69 = 0.75 \text{ m}^3/\text{m}$ and $1.08 \text{ m}^3/\text{m} \times 0.60 = 0.65 \text{ m}^3/\text{m}$).

4.3.2 Correction for Slope Morphology

A second factor that should be taken into account is the slope morphology. Both Southern Indian Lake and Discovery Mine have exposed slopes which are more than 15° , as opposed to Tail Lake slopes which are predominantly less than 6° . Stable slopes at Discovery Mine have been estimated to be 11° , and at Southern Indian Lake, the cross-section provided by Newbury and McCullough (1984) suggest that the stable slope is 10° . Therefore it is reasonable to conclude that, based on morphology, the chances of slope failures at Tail Lake due to over-steepened slopes exposed to wave action are limited, and may in fact not occur at all.

It is however acknowledged that mass flow movements can occur for slopes at less than 6° (McRoberts and Morgenstern 1974), and the solifluction at Tail Lake is evidence that such movement has occurred. It is however not possible to determine if this mass movement would be aggravated or enhanced by wave action as the lake level rises.

A third important consideration in estimating the shoreline erosion rate involves a comparison of the soil and ice conditions between the three sites under consideration. Clay contents at Southern Indian Lake are almost twice as high as at the other locations, and the ice content is also approximately 10% higher at Southern Indian Lake.

With all these factors combined, it is reasonable to assume that the biggest risk of sediment release at Tail Lake due to rising lake water level would be associated with the thawing of the newly submerged ground. As this ground thaws, thaw-settlement would occur, which may expose small scarps which would be subject to wave erosion. This process appears to be the primary cause of erosion in the gulleys at the RMC silver mine area and, as indicated previously, the annual total erosion loss has been estimated at approximately $0.14 \text{ m}^3/\text{m}$ of exposed gully slope.

This is about 7.5 times lower than the calculated erosion loss at Southern Indian Lake, where wave energy was attributed to be the major erosion mechanism. Applying an arbitrary factor of safety of 2.3 to this number and applying that to the wave energy corrected erosion loss for Tail Lake of 0.75

m^3/m of shoreline gives a total predicted soil loss of $0.23 \text{ m}^3/\text{m}$ of shoreline for Tail Lake (i.e. $1.08 \text{ m}^3/\text{m} \div 0.14 \text{ m}^3/\text{m} = 7.54$; $2.3 \div 7.54 = 0.30$; $0.30 \times 0.75 \text{ m}^3/\text{m} = 0.23 \text{ m}^3/\text{m}$).

Applying a similar correction to the wave energy corrected erosion rate of $0.65 \text{ m}^3/\text{m}$ of shoreline for Discovery Mine yields a total predicted soil loss of $0.20 \text{ m}^3/\text{m}$ of shoreline (i.e. $1.08 \text{ m}^3/\text{m} \div 0.14 \text{ m}^3/\text{m} = 7.54$; $2.3 \div 7.54 = 0.30$; $0.30 \times 0.65 \text{ m}^3/\text{m} = 0.20 \text{ m}^3/\text{m}$). This value is significantly greater than the maximum measured rate of $0.14 \text{ m}^3/\text{m}$ of shoreline, suggesting that these corrections are conservative.

4.3.3 Total Erosion Rate

Based on the erosion corrections described in the previous sections, the total potential erosion rate at Tail Lake can be summarized by Figure 1. Depending on the shoreline erosion correction factor that is used, the total annual potential shoreline can range from about 1 million kg of shoreline material, assuming an erosion rate similar to that observed at the RMC silver mine of $0.14 \text{ m}^3/\text{m}$, to just under 10 million kg, using an erosion rate similar to that observed at the Southern Indian Lake (i.e. $1.08 \text{ m}^3/\text{m}$).

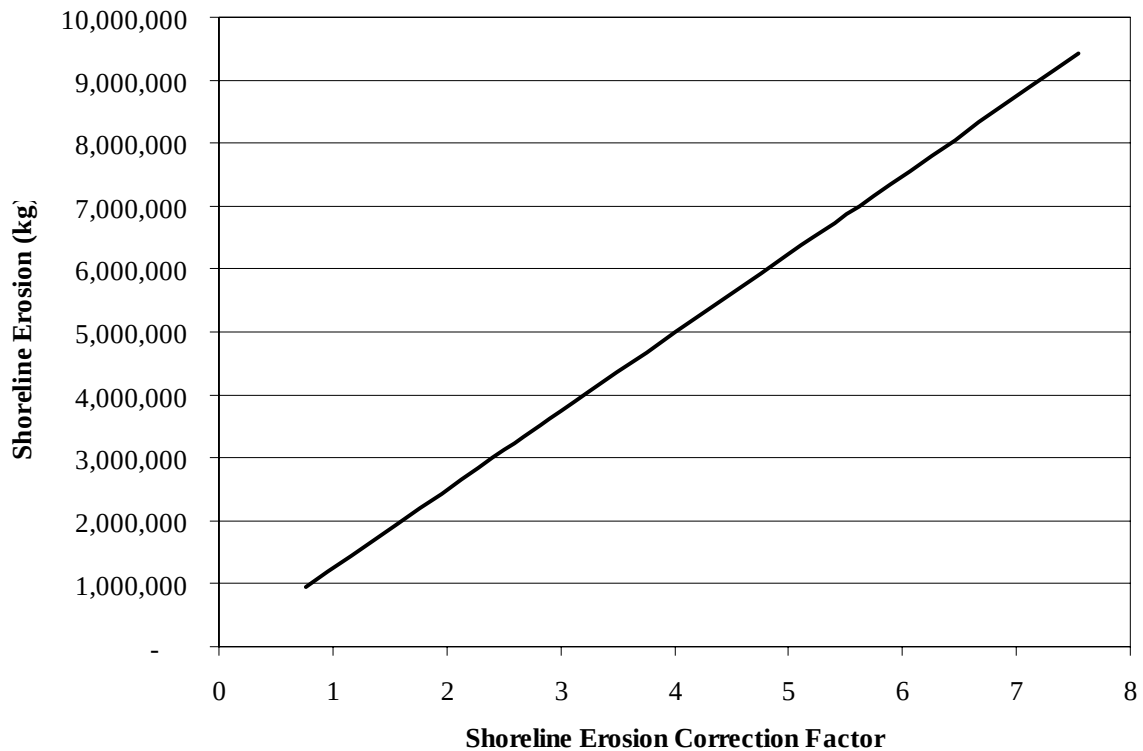


Figure 1: Range of potential shoreline erosion at Tail Lake

The total erosion at Tail Lake is calculated, assuming a water level at 28.3 m (i.e. the water level at long-term steady state). At this water level the total shoreline length is 8,200 m, and about 41% is bedrock controlled, such that 59% or about 4,900 m could potentially undergo shoreline erosion. Multiplying this value with the corrected shoreline erosion rate of $0.23 \text{ m}^3/\text{m}$ for a correction factor of 2.3, and assuming a sediment dry density of $2,600 \text{ kg}/\text{m}^3$, gives a total erosion mass of about 2,847,000 kg (i.e. $8,200 \text{ m} \times 59\% = 4,856 \text{ m}$ impacted shoreline; $4,856 \text{ m} \times 0.23 \text{ m}^3/\text{m} = 1,095 \text{ m}^3$ sediment release; $1,095 \text{ m}^3 \times 2,600 \text{ kg}/\text{m}^3 = 2,846,891 \text{ kg}$ sediment release).

Table 2 list the likely base case, lower and upper estimate of shoreline erosion that could be used in water quality predictions.

Table 2: Summary of base case and lower an upper estimates of shoreline erosion for Tail Lake

Scenario	Total Shoreline Erosion (kg)
Base case	2,846,891
Lower limit	948,964
Upper limit	7,354,467

4.4 Predicted Suspended Sediment Concentration

SRK (2005) provides a detailed discussion of the total suspended solids concentration in Tail Lake as a result of shoreline erosion amongst other processes. That analysis includes corrections for sedimentation rates of the particles based on representative samples from the shores of Tail Lake and the effects of residence time in the lake. It is however, worthwhile to provide a first order estimate of the expected total sediment loads in Tail Lake using only the information gleaned in this study. Such an estimate provides a ‘reality check’ on the hypothesis presented.

Newbury and McCullough (1984) estimated that the amount of sediments that remain in suspension is about 2%. The 2 % will be a function of the soil particle size distribution and soil physical properties including density, shape and surface properties. Nonetheless, using this value, and the volume of water in Tail Lake at an elevation of 28.3 m, after correcting for the volume occupied by the tailings, suggest that for an erosion rate of $0.23 \text{ m}^3/\text{m}$, the total suspended sediment concentration in Tail Lake would be $31.7 \text{ mg}/\text{L}$ (i.e. Free volume in Tail Lake @ 28.3 m = $1,798,704 \text{ m}^3$; $2,846,891 \text{ kg} \div 1,798,704 \text{ m}^3 \times 2\% = 31.7 \text{ mg}/\text{L}$).

It should be noted that clay mineralogy is known to impact turbidity (or suspended solids concentration) (Glassmann 2000; Bates *et al.* 1998), and smectite clay is generally considered to be one of the biggest contributors towards sustained turbidity problems (Bates *et al.* 1998).

Smectite is only present as an illite-smectite mixed clay layer in the Tail Lake shoreline soils (SRK 2005b), which comprise only 12% of the total clay content of the soil. Of this, only 10% is actually smectite layers, or 1.2% of the total clay content. The remaining clay minerals consist of illite and mica (58%) and chlorite (30%), both clay minerals which are known to settle out rapidly and not contribute much to turbidity.

Considering that only 24% of the clay sized fraction consists of clay minerals (43% quartz, 6% potassium feldspar, 24% plagioclase, 1% calcite and 2% pyrite), and based on the laboratory results for samples from Tail Lake, the average clay content is 23% by weight (SRK 2005b). With this information it is possible to estimate the potential sediment concentration in a different manner as well, as a check for the validity of the hypothesis described in the preceding sections.

If the annual dry mineral soil sediment load is $0.23 \text{ m}^3/\text{m}$ of shoreline, the sediment concentration associated with 100% of the clay sized fraction at the Tail Lake FSL would be 364 mg/L. Using only the clay mineral fraction, the sediment concentration is reduced to 87 mg/L, and if we consider that only the smectite fraction could contribute to suspended sediment, then the total suspended solids concentration is estimated to be about 1.05 mg/L.

5 Appropriate Shoreline Erosion Mitigation Measures

5.1 General

It is evident that thawing of the permafrost in the submerged shoreline zones of Tail Lake as the water level rises will occur. These areas are likely to undergo thaw-settlement which could expose a scarp of fine grained soil which may be subject to wave induced shoreline erosion. As documented in the preceding section of this report, it is reasonable to expect this shoreline erosion will result in an increase in suspended sediment concentration and turbidity in Tail Lake.

The hypothesis presented in this report has been used to estimate a probable reasonable upper bound (i.e. base case) for the rate of shoreline erosion and associated increased suspended sediment concentration. With the values quantified, a number of mitigation alternatives have been evaluated.

5.2 Mitigation Alternatives

5.2.1 Rip-Rap & Geotextile Erosion Protection

One mitigation strategy to minimize sediment yield into Tail Lake would be to cover the entire surface area surrounding Tail Lake that could be submerged at FSL with a layer of geotextile and to place a protective rip-rap layer approximately 50 cm thick over it. This will not prevent thaw-settlement from happening but will fulfill two important functions:

- fine sediment will be retained, minimizing the risk of suspended solids in Tail Lake, and
- the rip-rap will protect the shoreline from being physically eroded through wave action. Furthermore, this will ensure that erosion does not progress beyond the FSL, and after the lake level is lowered, erosion from surface runoff will be prevented.

This strategy is technically feasible; however, it would be an extremely conservative and costly alternative. Assuming the worst case scenario, i.e. Tail Lake is flooded to FSL, the exposed surface area that is not bedrock controlled is about 30 ha, which means that a total volume of cover rock of 150,000 m³ would be required for this mitigation alternative. Based on conceptual level cost estimates, this alternative would cost approximately \$5.4 million and would place an excessive burden on the local quarries.

Considering the fact that the proposed water management strategy for Tail Lake will result in a maximum water level of 29.4 m, with a total flooded footprint of about 13 ha (not discounting for bedrock control), the conceptual level cost estimate for full mitigation reduces to \$1.4 million, and only about 38,000 m³ of quarried rock is required. This is therefore a more reasonable and realistic mitigation strategy. It is however still conceivable that the entire flooded zone may not be subject to

shoreline erosion, and therefore SRK recommends that MHBL adopt the following mitigative strategy:

- Prior to depositing tailings into Tail Lake, pro-actively mitigate 20% of the perimeter of Tail Lake between the elevations of 28.3 m and 29.4 m. This means a total area of about 1.5 ha must be covered, requiring a total volume of rip-rap of about 7,600 m³, and about 15,300 m² of geotextile. Areas to be pro-actively mitigated would be areas where the slopes are greater than 6°, and where fetch lengths are the greatest.
- During operation, and prior to final closure, MHBL should be prepared to cover another 20% of the shoreline, i.e. placing another 7,600 m³ of rip-rap, and 15,300 m² of geotextile. Areas to be mitigated would be those areas where erosion has been seen to occur.
- At closure, i.e. as soon as the water level is lowered to 28.3 m, MHBL should be prepared to cover the remaining 60% of the shoreline, which is not bedrock controlled, should shoreline erosion remain a problem. This would require placement of an additional 22,800 m³ of rip-rap, and 45,700 m² of geotextile. Areas to be mitigated would be areas where visible erosion is seen to occur, and it is feasible that the entire zone may not need to be covered.
- Finally, the ultimate contingency strategy would be to cover the entire exposed shoreline, as if flooding extended to the FSL elevation of 33.5 m. For this contingency, placement of an additional 108,300 m³ of rip-rap would be required and 216,500 m² of geotextile.

This proposed mitigation strategy is based on the fact that between the elevations 28.3 m and 33.5 m, 41% of the shoreline is bedrock, and at least 76% of the total area is on slopes of less than 6°. Considering the fact, that all the perimeter soils, if not bedrock, is similar ice-rich marine silt and clay, it is therefore reasonable to suggest that the steeper slopes would have greater potential to erode, and therefore the proposed mitigation strategy would entail pro-actively mitigating about 85% of the steep slopes, in areas close to the dams where the fetch would be the greatest.

It should be noted that the surface areas used in these calculations are based on the stage curve for Tail Lake, which includes portions of Tail Lake up to the two dams. For this stage curve the Tail Lake surface area at 28.3 m is 80.8 ha, and the surface area at FSL is 130.4 ha. This differs from the actual surface area of the body of water in Tail Lake as reported in the NNLP of 76.6 ha (Golder 2005b).

5.2.2 Relocation of Tail Lake Access Road

A tailings access road is planned along the eastern catchment of Tail Lake (SRK 2005a). This access road could be re-routed to follow along the eastern FSL shoreline of Tail Lake. This would serve to function as a final erosion break against any physical erosion along this portion of the lake, ensuring that no progressive erosion would occur beyond the FSL.

This is not a complete mitigation strategy, but could be easily and cost effectively be implemented in combination with any other mitigation strategy with limited cost implication.

5.2.3 Silt Curtain

Based on the estimated suspended sediment concentration that could be deposited annually into Tail Lake, it would be feasible to install a series of silt curtains in Tail Lake, during the open water season that would retain the suspended sediments. This would provide an added factor of safety against any unforeseen suspended sediment or turbidity issues.

Silt curtains are a proven technology, and are designed and used specifically for this type of application. These fences do however require maintenance and supervision. This mitigation strategy is therefore not a long-term sustainable solution, but could be effectively used as part of a mitigation strategy during operation and throughout the time leading towards final closure.

Assuming annual redeployment of silt curtains, with no re-use of material, the cost of this strategy has been estimated at approximately \$75,000 per year.

5.2.4 Re-establish Vegetation

The preferred long-term mitigation approach adopted for the Discovery Mine borrow pit is re-vegetation of the exposed slopes. This approach appears to be having the desired effect by both slowing down erosion, as well as resulting in a reduced sediment load in the borrow pit (Cassie 2004). It is expected that a stable self-sustaining vegetation mat would be developed in a five year period, during which time the vegetation will be assisted by artificial means through addition of nutrients etc., as required. The reason this approach has the potential to work efficiently, is that the re-establishment of vegetation would re-create the organic cover layer that was stripped and which initiated the thermal erosion at the borrow pit. Furthermore, the vegetation will reduce water inflow velocities from snowmelt and runoff, which will reduce the overland erosion potential.

At Tail Lake, once the North Dam is breached, it is expected that permafrost will re-establish in the slopes surrounding Tail Lake; however, without a vegetative cover, the exposed beach may continue to be subject to overland erosion due to runoff and snowmelt. This will continue until all fines have been washed out leaving behind the sand and gravel particles that form the current beaches. Therefore, one reasonable mitigation approach would be to re-vegetate the exposed slopes immediately after the water level is dropped.

Although, in concept, this mitigation strategy has merit, the harsh climate at the Doris North Project site makes it extremely difficult to establish sustainable growth within relatively short period of time. Any mitigation strategy that relies on sustained vegetation would likely require continued inspection and possibly maintenance for at least a decade after final closure.

5.3 Recommended Mitigation: Adaptive Management Plan

Considering the state-of-the-art in science associated with arctic shoreline stability, specifically associated with rising and lowering of lake water levels, and weighing the potential adverse environmental effects with potential mitigation costs, SRK is of the opinion that an adaptive management plan would be the environmentally and technologically responsible approach.

As described in the preceding sections, SRK has proposed a hypothesis for the potential erosion mechanisms, as well as the potential suspended sediment concentration to be released annually from the Tail Lake shoreline. SRK proposes that MHBL implement an adaptive management plan that would use this hypothesis as the basis upon which to trigger mitigation measures, much like a conventional water quality model would be used. These mitigative measures would be implemented in addition to the proposed mitigation strategy proposed in Section 5.2.1, i.e. it covers the portions of Tail Lake shoreline beyond the 20% proactively covered zone. The details of the proposed adaptive management plan are as follows:

Monitoring

MHBL completed six holes around Tail Lake in 2004 and 2005, and installed thermistor strings (SRK 2005c). At the same time MHBL conducted a detailed strip survey, 50 m wide extending from the Tail Lake shoreline to the potential new Tail Lake FSL.

MHBL should monitor the thermistors monthly (during operation; after operation ceases this should be done seasonally until five years after the lake reaches FSL) to determine how the active layer changes as the water level rises.

The strip surveys should be redone annually, including a bathymetry survey of the underwater section of the strip down to the original lake water level of 28.3 m (this should continue for five years after the FSL is reached or till there is no discernable profile difference in two consecutive years). This will provide information of the slope morphology as time progresses, as well as allow for calculation of a sediment balance.

Annually, a qualified Geotechnical Engineer, registered to practice in Nunavut Territory, should conduct a physical investigation of the shoreline conditions to identify areas where mitigation may be required. This could be done in conjunction with an annual dam safety inspection, and will likely cease five years after the North Dam has been breached.

Finally, water quality samples should be collected throughout the open water season to measure the total suspended solids (TSS) content and turbidity in Tail Lake. Water quality sampling will also be done through the ice, immediately prior break-up to determine whether complete settlement of the any residual suspended solids has occurred.

Reporting

The monitoring results should be documented annually in a formal report. Since significant portions of the monitoring data could only be gathered during the summer season, it is expected that this report would be submitted no later than December every year, such that mitigation works, if required, can be initiated for the following winter and summer periods without delay. The details of such reporting will have to be confirmed at the appropriate regulatory permitting stages.

Mitigation Triggers

If at any point during the life of Tail Lake as a tailings impoundment, the suspended sediment concentration in Tail Lake exceeds the MMER value of 15 mg/L at the point of discharge, a silt curtain will be installed across the entire width of the lake in a location upstream of the discharge uptake. At such time, water quality monitoring will be done both upstream and downstream of the silt curtain to ensure the success and integrity of the curtain.

If the TSS concentration downstream of the silt curtain (if required) exceeds the MMER value before Tail Lake reaches FSL, or would not meet CCME Guideline values at the designated monitoring point downstream of the waterfall in Doris Creek during discharge, no water will be discharged. The Dam will enable Tail Lake to store all incoming natural and process water for a period of at least five years, using conservative water balance assumptions.

Areas where active erosion loss is taking place will be covered in geotextile and a 50 cm thick layer of 150 mm nominal size rip-rap will be placed over the geotextile. This protection will cover an area at least 1 m beyond the extremities of the visible erosion feature.

This report, **1CM014.006 – Potential Shoreline Erosion Processes at Tail Lake, Doris North Project, Hope Bay, Nunavut, Canada**, was prepared by SRK Consulting (Canada) Inc.

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Attachment 1
SRK Technical Memorandum
Re. "Inspection of areas of permafrost degradation near
Doris North Project site", dated December 23, 2004

Technical Memorandum

To:	Doris North Project File	Date:	December 23, 2004
cc:		From:	Dylan MacGregor Maritz Rykaart
Subject:	Inspection of areas of permafrost degradation near Doris North Project site	Project #:	1CM014.004.0500

1 Introduction

Several areas of permafrost degradation were identified during surficial mapping in the region of the Doris North project. Selected areas were investigated during the period of August 24-26, 2004 to record the characteristics of the failing material and to collect samples for laboratory testing of material properties.

The investigation focussed on two main areas of permafrost degradation. The first area investigated was in the vicinity of the former Roberts Mining Company (RMC) silver mine, located north of the Roberts Lake outflow. Three sites in this area appear to have experienced disturbance-induced permafrost degradation and gully formation related to historic mining activities which occurred during the 1970s. The second area investigated was southwest of Roberts Bay, where natural degradation of permafrost is actively occurring along the flanks of the Windy Creek valley. A number of digital photos were taken during the investigation; these are filed on a CD which is on record at SRK's office in Vancouver.

At each site, the length of active degradation was investigated. The gullies were walked, and observations about drainage, soil type and structure, vegetation, slope and degree of activity were recorded. The gullies were photographed, and a representative soil sample was collected from each site and submitted for laboratory characterization.

2 Permafrost Degradation in Disturbed Areas

2.1 North of former mine

Area 1 in Figure 1 consists of a north-south oriented valley to the northwest of the RMC site. Markings from vehicular traffic in this area are concentrated along two routes, one from the site west towards Roberts Bay, and another from the mine site north along the eastern flank of the valley. The vertical aerial photograph in Figure 2 shows these tracks and the two areas where gullies have developed due to ongoing degradation of permafrost. Markings on the tundra from vehicular traffic are very difficult to distinguish from the ground, and are generally obvious only on aerial photographs.

The southern gully system in Area 1 is developed on a relatively steep section of slope. There is no indication upstream or downstream of pre-existing surface drainage channels. The main channel of this system is approximately 500 m in length. Gully depth reaches a maximum of five meters in the vicinity of the 'Y' shown in Figure 2, and is typically 3 m across the extent of the system. A representative sample (SRKPD02) of frozen ice-rich soil was collected from a hand excavation from an active failure surface on the wall of the left fork immediately upstream of the bifurcation. The active failure surfaces were observed to be seepage faces; faces were wet only, with no flow to isolated drips observed.

Upstream origin of gully system is series of shallow (<0.3 m) irregular linear depressions, which look like caribou paths. Ponded water is observed in 25% of these depressions; the remainder are wet at the surface, and support darker green vegetation than the adjacent tundra, but no surface water was present.

Sediment produced during gully erosion has been deposited in a broad splay on valley bottom at foot of gully; sediment up to coarse sand size was carried for approximately 50 m beyond mouth of gully. Within the confines of the gully, in-channel boulders were common. This suggests that high-energy flows occur in the channel during a portion of the year, and that finer sediment is removed. Rare gravel lag deposits were noted and very little sand and fine sediment was observed within the gully system. At the time of investigation, a very low but persistent flow of water was present on surface over approximately 80% of the gully system. Areas where surface water was absent had the former channel bottom covered by recently collapsed material from adjacent banks. Water appeared to be flowing under the recently collapsed material and reappearing downstream, and can be considered to be a continuous flow. Flow volumes at the time of the investigation were visually estimated to be 1-2 litres/ minute.

North of the southern area of permafrost degradation is a relatively flat section where no surface erosion is evident. This area is shown in Figure 2, and is clearly marked by the patterned ground which typically develops in ice-rich fine-grained sediments. Surface drainage in this flat section appears to be diffuse and likely follows the margins of the ice-wedge polygons seen in the aerial photograph. The shallow pond located north of the region of patterned ground attests to the poorly drained condition of this flat section.

North of the shallow pond, bedrock outcrops on the west side of the valley and forms small cliffs and steep rocky slopes. On the east side of the valley, bedrock is absent and the valley floor again becomes steeper. Another area of permafrost degradation and gully development is found here. As with the southern gully system, there is no evidence of a pre-existing surface drainage channel. These gullies are approximately 350 m in length, reach a maximum of 4 m depth, and typically are 2 to 2.5 m deep. A representative sample of frozen ice-rich soil (SRKPD01) was collected midway along the main gully as shown in Figure 2. Water was present in isolated pools within channel; no continuous flowing water was observed.

2.2 Adjacent to Roberts Lake, south of former mine

Linear permafrost degradation is present in Area 3, shown on Figure 1. Recent aerial photographs show tracks from vehicular traffic that remain visible at present. Tracks lead from former mine site towards Roberts Lake down a 100 m wide broad valley flanked by steep bedrock ridges (Figure 3). Thick overburden is present in the valley bottom. Vehicular tracks terminate at the northern end of the current gully system, as shown in Figure 3. The valley bottom upslope of the gully has a gentle uniform slope and a uniform cover of tundra grasses.

No evidence of a pre-existing drainage channel was observed either upstream or downstream of the gully in Area 3. Between the southern terminus of the gully and the shore of Roberts Lake, an alluvial fan deposit has formed from the deposition of eroded sediment over a distance of approximately 50 m. Upstream (north) of the fan, the channel disappears for approximately 50 m and the flowpath is marked by lush green grass, in contrast to the adjacent brown and reddish brown tundra grasses and willows.

The gully terminus is approximately 100 m from Roberts Lake. The lower 350 m of gully is generally inactive, 1-2 m deep, with grass-covered banks and rare patches of mineral soil. Abundant rounded granitic boulders are concentrated in channel, and are visible on plain adjacent to channel as well. No surface flow is noted in this lower inactive portion of the gully system.

Total gully length is 500 m, and maximum depth is 3 m, approximately 100 m from the upslope gully terminus. Average gully depth was 2 m. Gully walls were generally active for 150 m below upper terminus, and inactive for remaining 350 m. A sample was collected from an active gully wall approximately 100 m below the upper terminus. The sample (SRKPD03) was collected by hand excavating the sidewall of the gully until frozen material was encountered. There was a discontinuous flow at the bottom of the active

portion of the gully at the time of inspection; maximum flow was visually estimated to be approximately 2 litres/minute.

3 Permafrost Degradation in Undisturbed Areas

3.1 Lower Windy Creek

Widespread active natural permafrost degradation is present in Area 3 (Figure 1) on the slopes adjacent to lower Windy Creek, along the 3 km reach that runs from Roberts Bay to the unnamed lake upstream. These slopes form a 20 to 50 m wide valley that is greatly oversized for Windy Creek. Large scale patterned ground was not observed either from the air or during ground traverses. Frost boils and small (metre scale) ice wedge polygons were observed on the flat bench adjacent to the valley.

The vertical aerial photograph in Figure 4 shows Windy Creek and the outline of the area where permafrost degradation is occurring. As seen in Figure 4, the Windy Creek valley is incised into a uniform geomorphic unit that blankets the bottom of a larger valley, that is bounded by rock ridges to the east and west, and that slopes gently towards Roberts Bay. Bedrock is exposed within the creek channel at one point and is common along the western side of the valley from the upstream lake to approximately 1.5 km downstream, as shown in Figure 4.

There was no evidence of recent seasonal flows that would have the capacity to form the observed incised valley. It appears that larger flows occurred in the geologic past, and that channel formation was accomplished by these larger flows. Within this larger valley, a defined channel has formed that is appropriately sized to the observed flow; there is evidence of seasonal overtopping of this channel and a small floodplain has developed adjacent to the current channel in most areas.

There are isolated examples of the current creek undercutting the larger channel banks and causing erosion. The large cut banks produced by undercutting have slopes approaching 1H:1V, and are much steeper than the slopes of active banks where toe stability exists. However, it appears that the prevalent process acting on the walls of the large incised channel is the melting of ice-rich permafrost and the subsequent erosion of fine-grained sediment. Evidence of this is found in the seepage fronts observed on many of the active banks, and the development of immature dendritic drainage patterns in gullies where no surface waters sources were identified and where seasonal concentration of meltwater is unlikely. Lateral gully formation away from the centreline of Windy Creek is variably developed, but includes instances where incision has progressed upslope approximately 50 m.

Commonly, rounded active slopes were observed where erosion appears to occur as incremental creep. Slopes undergoing creep appear to be sufficiently active to prevent the establishment of vegetation. The driving force behind the widespread creep observed is a combination of the voids created and the water produced during the melting of ice-rich permafrost.

If slopes where vegetation has been established are considered to be approximately in equilibrium, then very few of the slopes along lower Windy Creek meet these criteria. Those that do have slope angles that were visually estimated to range from 15 to 25 degrees. There are many slopes with slope angles within this range that are currently active, and that are not developing any vegetative cover at all.

Mechanisms of erosion appear to be a combination of slow and rapid mass movement. Two rapid flow deposits were observed, where it appears that a skin-type of failure has occurred and soil has flowed downslope. The deposits formed by this type of failure tend to form low lobes with an elevated leading edge. One such flow was observed to have displaced Windy Creek and forced the channel to relocate against the opposite wall of the larger channel. Both flow deposits were observed to be 20 to 30 m across and 2 to 3 m deep at the thickest point.

Physical instability of the banks was also noted to be caused by animals. Animal burrows were common, and in one location it appeared that a bear had excavated a 2 m x 2 m area in a highly burrowed bank. These processes do not result in a large volume of material movement, but may be responsible for ongoing instability in some banks.

A representative sample of frozen ice-rich soil was collected from one of the active cut banks, at the position indicated in Figure 4. Ice constituted approximately 50% of the formation at the sample location.

4 Material Characterization

Understanding the engineering characteristics of permafrost soils near the project area that are currently undergoing degradation will aid in predicting the effects of disturbance on permafrost soils within the Doris North Project area. Table 1 summarizes a list of samples that were collected at the areas of natural and disturbance-induced permafrost degradation. Laboratory testing to determine the physical properties of these samples were conducted by EBA Engineering Ltd. in Yellowknife. The results are summarized in Table 2, and the complete laboratory data sheets are included as Appendix A.

Table 1 Summary of Samples Collected

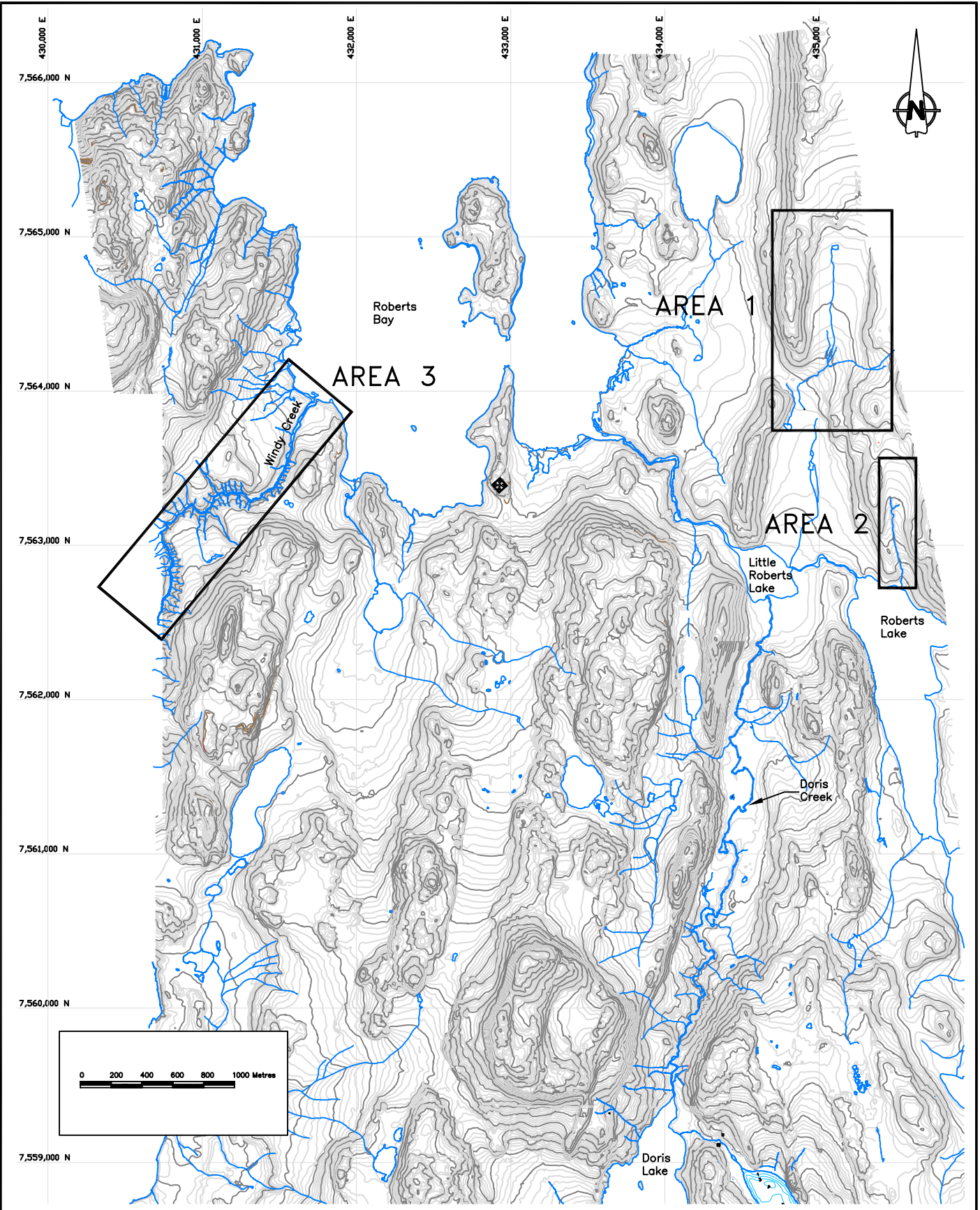
Sample ID	Sample Location	Field Classification	Laboratory Testing
SRKPD-01	Area 1	SM	Particle Size Distribution, Atterberg Limits, Moisture Content
SRKPD-02	Area 1	ML	Particle Size Distribution, Atterberg Limits, Moisture Content
SRKPD-03	Area 2	ML	Particle Size Distribution, Atterberg Limits, Moisture Content
SRKPD-04	Area 3	ML	Particle Size Distribution, Atterberg Limits, Moisture Content

Table 2 Summary of Laboratory Results

Sample	Moisture Content (%)	Atterberg Limits				Particle Size Distribution				
		Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	UCSC Classification	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Silt Content (%)	Clay Content (%)
SRKPD-01	33.6	20	16	4	CL	0	30	70	58	12
SRKPD-02	61.0	28	23	4	CL	2	24	74	56	18
SRKPD-03	55	37	23	41	CL	0	2	98	67	31
SRKPD-04	41.4	28	16	12	CL	0	28	72	45	27

Figures

Dwg Ref: Site-Plan-2004 (Area Plan).dwg

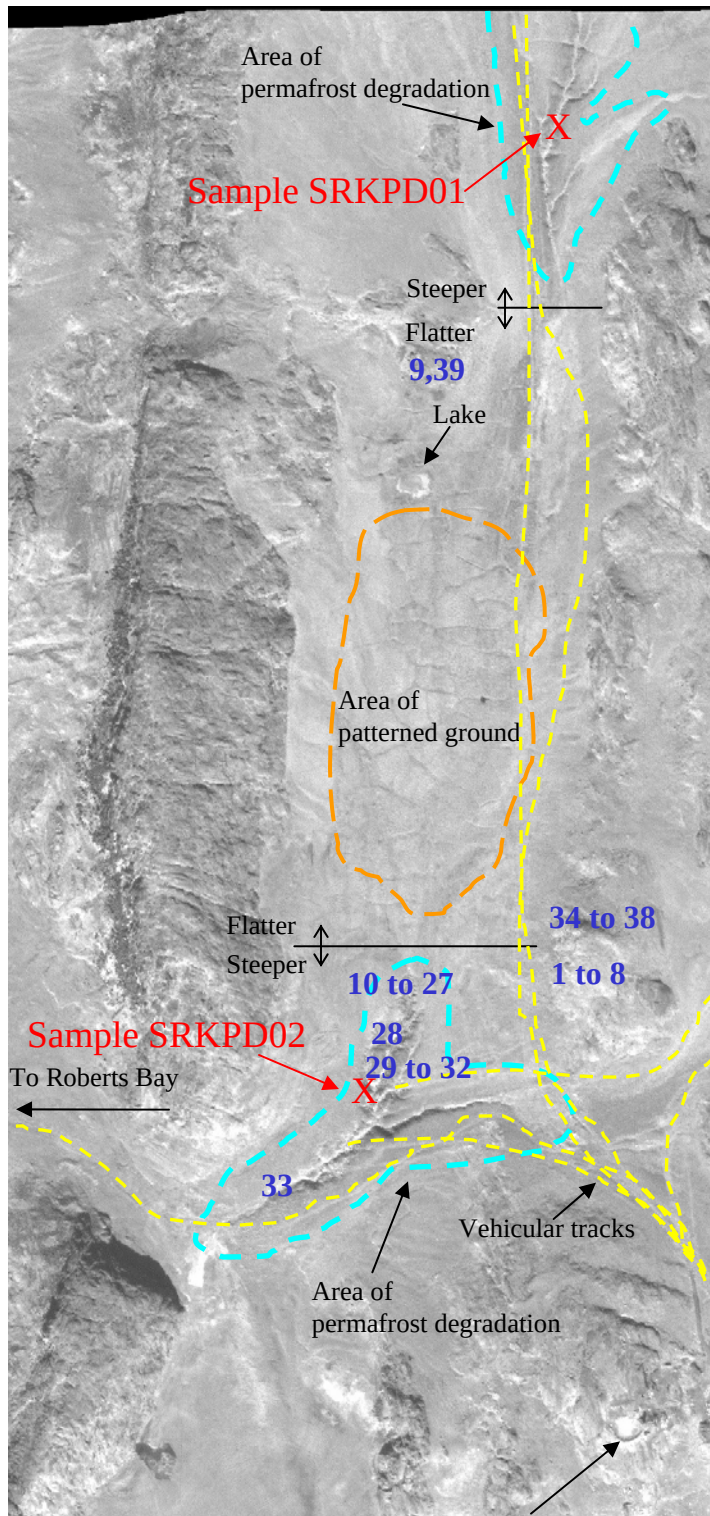


MIRAMAR HOPE BAY LIMITED

DORIS NORTH PROJECT

Permafrost Degradation
Investigation Areas

PROJECT NO.	DATE	APPROVED	FIGURE
1CM014.004.0050	Oct. 2004		1



1 = Location and # of photo

500 m



Miramar Hope Bay Limited

Doris North Project
Investigation of Permafrost Degradation

**Area 1: Permafrost Degradation
North of Former Mine**

PROJECT:
1CM014.004.0050

DATE:
October 2004

APPROVED:

FIGURE:

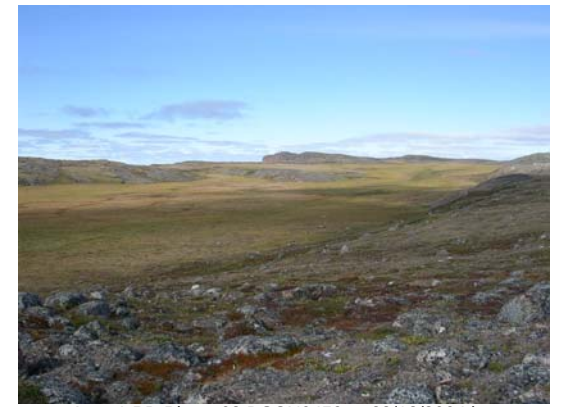
2



Area.1.PD.Photo-01.DSCN0446: - 23/12/2004 by



Area.1.PD.Photo-02.DSCN0453: - 23/12/2004 by



Area.1.PD.Photo-03.DSCN0459: - 23/12/2004 by



Area.1.PD.Photo-04.DSCN0460: - 23/12/2004 by



Area.1.PD.Photo-05.DSCN0461: - 23/12/2004 by



Area.1.PD.Photo-06.DSCN0462: - 23/12/2004 by



Area.1.PD.Photo-07.DSCN0463: - 23/12/2004 by



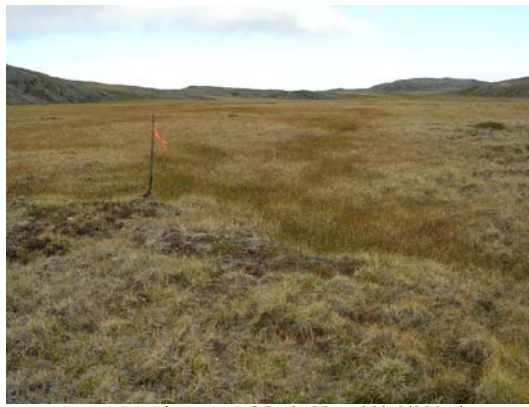
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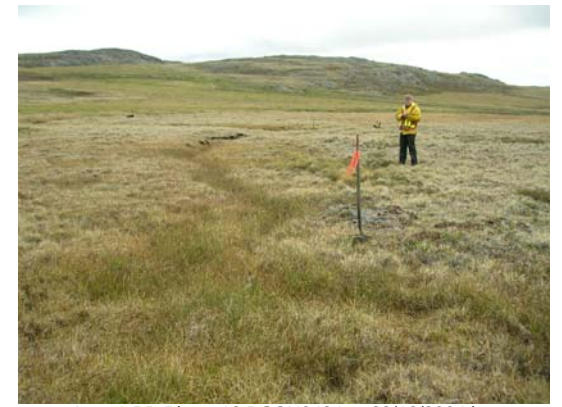
Area.1.PD.Photo-09.DSCN0472: - 23/12/2004 by



Area.1.PD.Photo-10.DSCN0482: - 23/12/2004 by



Area.1.PD.Photo-11.DSCN0483: - 23/12/2004 by



Area.1.PD.Photo-12.DSCN0484: - 23/12/2004 by



Area.1.PD.Photo-13.DSCN0485: - 23/12/2004 by



Area.1.PD.Photo-14.DSCN0486: - 23/12/2004 by



Area.1.PD.Photo-15.DSCN0487: - 23/12/2004 by



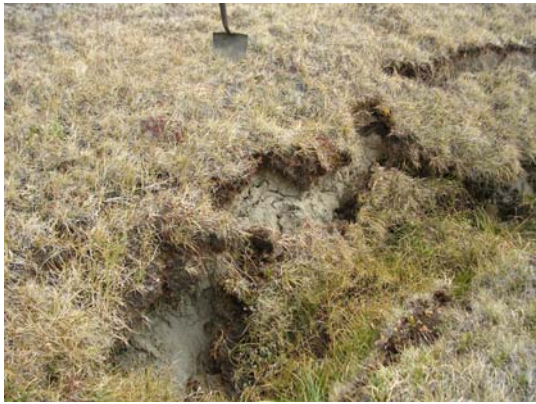
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Area.1.PD.Photo-17.DSCN0489: - 23/12/2004 by



Area.1.PD.Photo-18.DSCN0490: - 23/12/2004 by



Area.1.PD.Photo-19.DSCN0491: - 23/12/2004 by



Area.1.PD.Photo-20.DSCN0492: - 23/12/2004 by



Area.1.PD.Photo-21.DSCN0493: - 23/12/2004 by



Area.1.PD.Photo-22.DSCN0494: - 23/12/2004 by



Area.1.PD.Photo-23.DSCN0495: - 23/12/2004 by



Area.1.PD.Photo-24.DSCN0496: - 23/12/2004 by



Area.1.PD.Photo-25.DSCN0497: - 23/12/2004 by



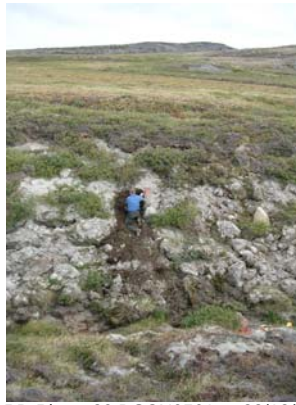
Area.1.PD.Photo-26.DSCN0498: - 23/12/2004 by



Area.1.PD.Photo-27.DSCN0499: - 23/12/2004 by



Area.1.PD.Photo-28.DSCN0500: - 23/12/2004 by



Area.1.PD.Photo-29.DSCN0501: - 23/12/2004 by



Area.1.PD.Photo-30.DSCN0502: - 23/12/2004 by



Area.1.PD.Photo-31.DSCN0503: - 23/12/2004 by



Area.1.PD.Photo-32.DSCN0504: - 23/12/2004 by



Area.1.PD.Photo-33.DSCN0505: - 23/12/2004 by



Area.1.PD.Photo-34.PD_Valley_1_North: - 23/12/2004 by



Area.1.PD.Photo-35.PD_Valley_2: - 23/12/2004 by



Area.1.PD.Photo-36.PD_Valley_3: - 23/12/2004 by



Area.1.PD.Photo-37.PD_Valley_4: - 23/12/2004 by

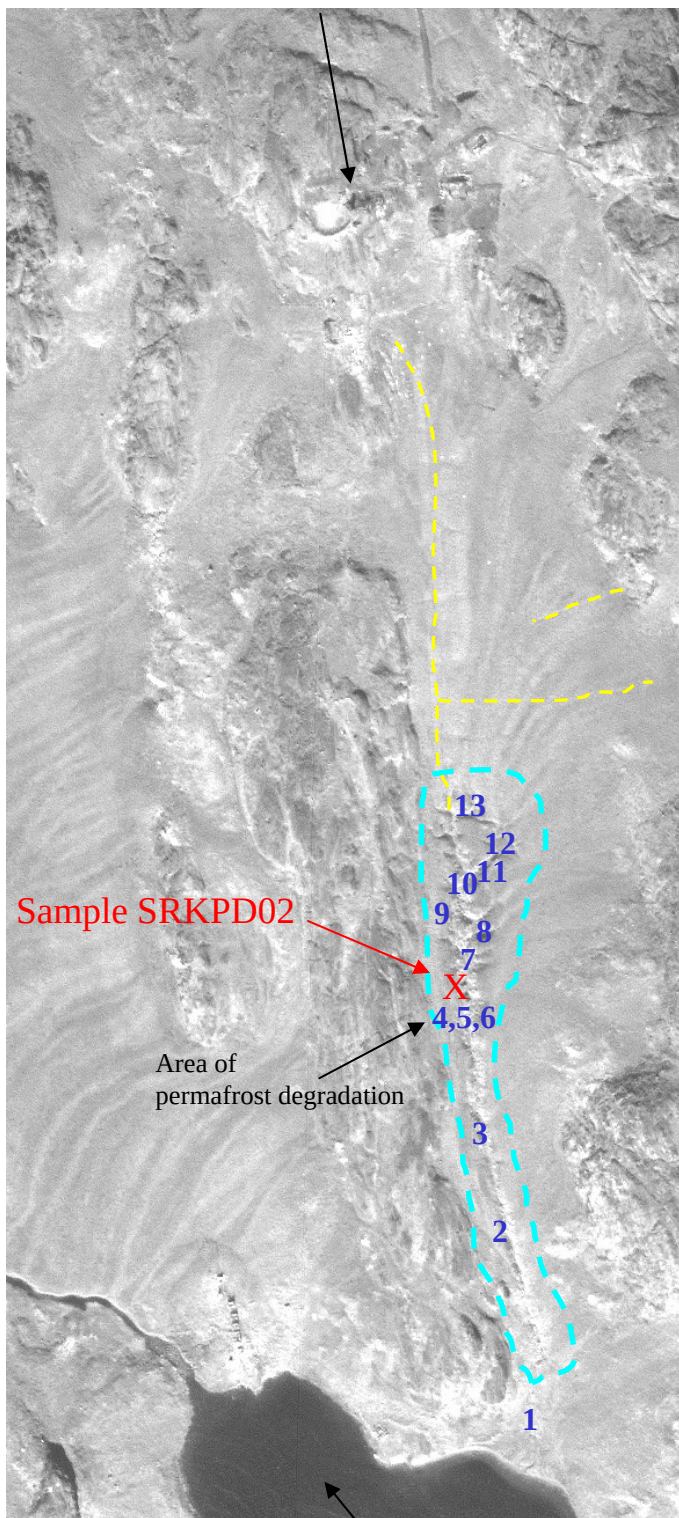


Area.1.PD.Photo-38.PD_Valley_5_South: - 23/12/2004 by



Area.1.PD.Photo-39.PD_Valley_N_end_look_South: - 23/12/2004 by

Former RMC mine



Roberts Lake

1 = Location and # of photo

500 m



Miramar Hope Bay Limited

Doris North Project
Investigation of Permafrost Degradation

**Area 2: Permafrost Degradation
South of Former Mine**

PROJECT:
1CM014.004.0050

DATE:
October 2004

APPROVED:

FIGURE:

3



Area.2.PD.Photo-01.DSCN0515: - 23/12/2004 by



Area.2.PD.Photo-02.DSCN0516: - 23/12/2004 by



Area.2.PD.Photo-03.DSCN0517: - 23/12/2004 by



Area.2.PD.Photo-04.DSCN0518: - 23/12/2004 by



Area.2.PD.Photo-05.DSCN0519: - 23/12/2004 by



Area.2.PD.Photo-06.DSCN0520: - 23/12/2004 by



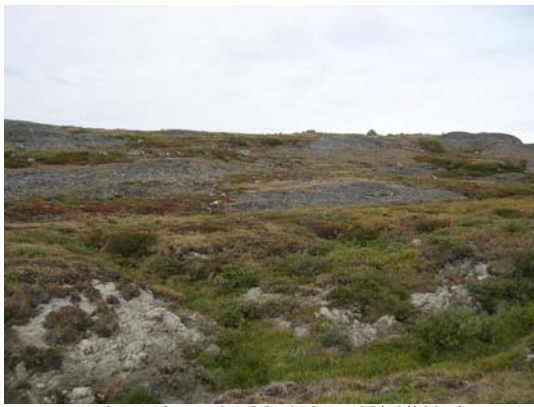
Area.2.PD.Photo-07.DSCN0521: - 23/12/2004 by



Area.2.PD.Photo-08.DSCN0522: - 23/12/2004 by



Area.2.PD.Photo-09.DSCN0523: - 23/12/2004 by



Area.2.PD.Photo-10.DSCN0524: - 23/12/2004 by



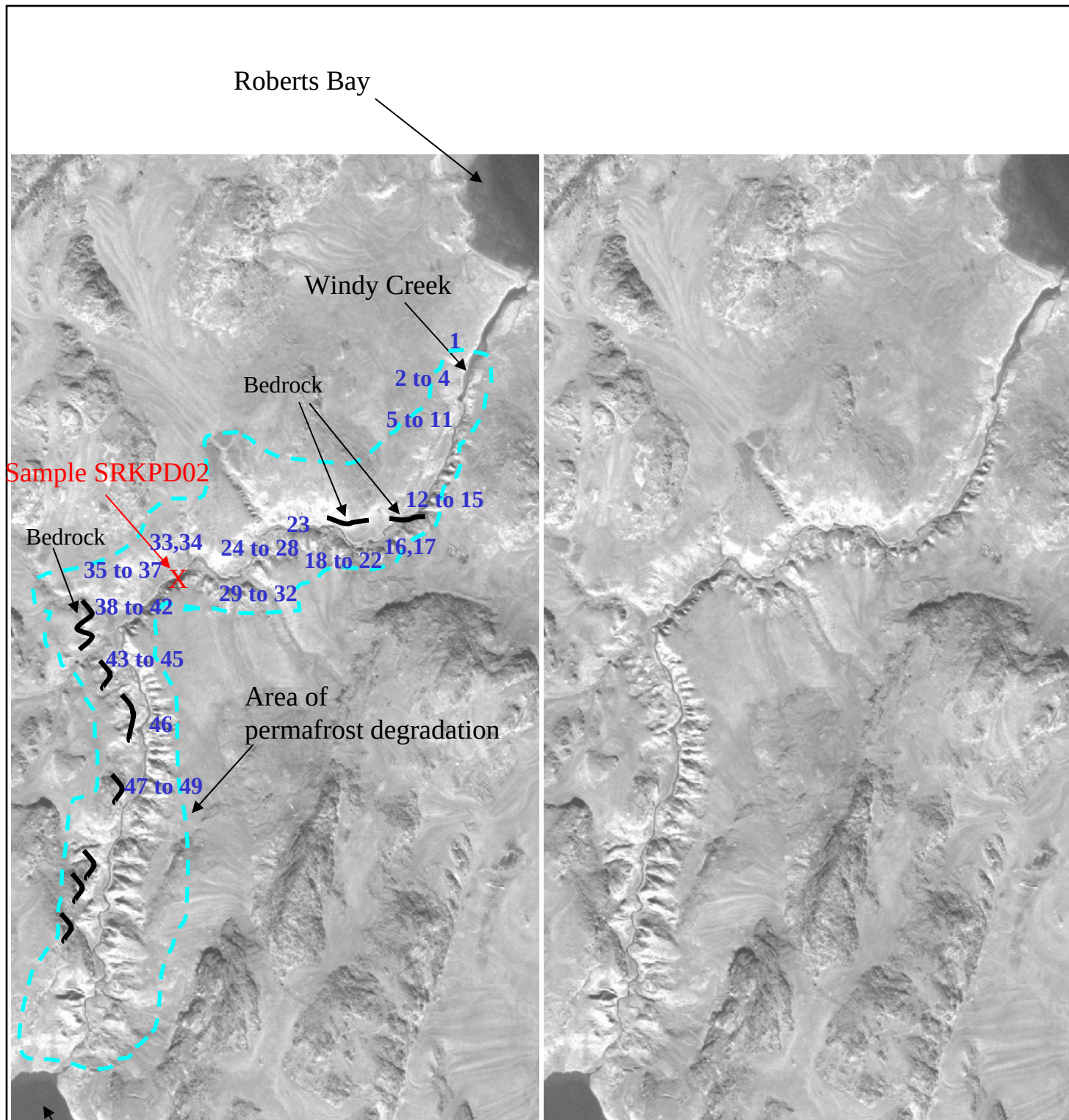
Area.2.PD.Photo-11.DSCN0525: - 23/12/2004 by



Area.2.PD.Photo-12.DSCN0526: - 23/12/2004 by



Area.2.PD.Photo-13.DSCN0527: - 23/12/2004 by



1 = Location and # of photo
 50 to 56 are miscellaneous photos

 SRK Consulting <i>Engineers and Scientists</i>	Doris North Project Investigation of Permafrost Degradation		
	Area 3: Permafrost Degradation Along Lower Windy Creek		
Miramar Hope Bay Limited	PROJECT: 1CM014.004.0050	DATE: October 2004	APPROVED:
			FIGURE: 4



Area.3.PD.Photo-1.DSCN0529: - 23/12/2004 by



Area.3.PD.Photo-10.DSCN0544: - 23/12/2004 by



Area.3.PD.Photo-11.DSCN0545: - 23/12/2004 by



Area.3.PD.Photo-12.DSCN0546: - 23/12/2004 by



Area.3.PD.Photo-13.DSCN0547: - 23/12/2004 by



Area.3.PD.Photo-14.DSCN0548: - 23/12/2004 by



Area.3.PD.Photo-15.DSCN0549: - 23/12/2004 by



Area.3.PD.Photo-16.DSCN0550: - 23/12/2004 by



Area.3.PD.Photo-17.DSCN0551: - 23/12/2004 by



Area.3.PD.Photo-18.DSCN0552: - 23/12/2004 by



Area.3.PD.Photo-19.DSCN0553: - 23/12/2004 by



Area.3.PD.Photo-2.DSCN0530: - 23/12/2004 by



Area.3.PD.Photo-20.DSCN0554: - 23/12/2004 by



Area.3.PD.Photo-21.DSCN0555: - 23/12/2004 by



Area.3.PD.Photo-22.DSCN0556: - 23/12/2004 by



Area.3.PD.Photo-23.DSCN0557: - 23/12/2004 by



Area.3.PD.Photo-24.DSCN0558: - 23/12/2004 by



Area.3.PD.Photo-25.DSCN0559: - 23/12/2004 by



Area.3.PD.Photo-26.DSCN0560: - 23/12/2004 by



Area.3.PD.Photo-27.DSCN0561: - 23/12/2004 by



Area.3.PD.Photo-28.DSCN0562: - 23/12/2004 by



Area.3.PD.Photo-29.DSCN0563: - 23/12/2004 by



Area.3.PD.Photo-3.DSCN0531: - 23/12/2004 by



Area.3.PD.Photo-30.DSCN0564: - 23/12/2004 by



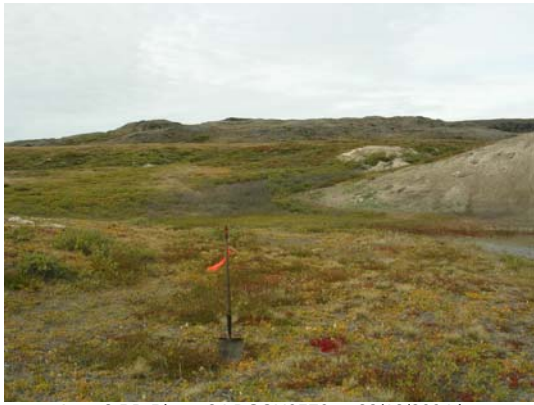
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Area.3.PD.Photo-32.DSCN0566: - 23/12/2004 by



Area.3.PD.Photo-33.DSCN0569: - 23/12/2004 by



Area.3.PD.Photo-34.DSCN0570: - 23/12/2004 by



Area.3.PD.Photo-35.DSCN0571: - 23/12/2004 by



Area.3.PD.Photo-36.DSCN0572: - 23/12/2004 by



Area.3.PD.Photo-37.DSCN0573: - 23/12/2004 by



Area.3.PD.Photo-38.DSCN0574: - 23/12/2004 by



Area.3.PD.Photo-39.DSCN0575: - 23/12/2004 by



Area.3.PD.Photo-4.DSCN0532: - 23/12/2004 by



Area.3.PD.Photo-40.DSCN0576: - 23/12/2004 by



Area.3.PD.Photo-41.DSCN0577: - 23/12/2004 by



Area.3.PD.Photo-42.DSCN0578: - 23/12/2004 by



Area.3.PD.Photo-43.DSCN0579: - 23/12/2004 by



Area.3.PD.Photo-44.DSCN0580: - 23/12/2004 by



Area.3.PD.Photo-45.DSCN0581: - 23/12/2004 by



Area.3.PD.Photo-46.DSCN0582: - 23/12/2004 by



Area.3.PD.Photo-47.DSCN0583: - 23/12/2004 by



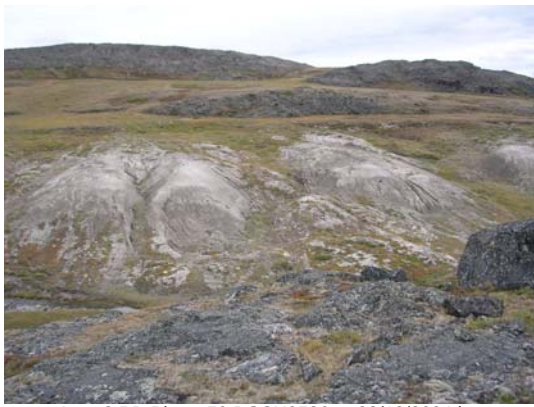
Area.3.PD.Photo-48.DSCN0584: - 23/12/2004 by



Area.3.PD.Photo-49.DSCN0585: - 23/12/2004 by



Area.3.PD.Photo-5.DSCN0534: - 23/12/2004 by



Area.3.PD.Photo-50.DSCN0586: - 23/12/2004 by



Area.3.PD.Photo-51.DSCN0587: - 23/12/2004 by



Area.3.PD.Photo-52.DSCN0588: - 23/12/2004 by



Area.3.PD.Photo-53.DSCN0589: - 23/12/2004 by



Area.3.PD.Photo-54.DSCN0590: - 23/12/2004 by



Area.3.PD.Photo-55.DSCN0591: - 23/12/2004 by



Area.3.PD.Photo-56.DSCN0592: - 23/12/2004 by



Area.3.PD.Photo-6.DSCN0535: - 23/12/2004 by



Area.3.PD.Photo-7.DSCN0536: - 23/12/2004 by



Area.3.PD.Photo-8.DSCN0537: - 23/12/2004 by



Area.3.PD.Photo-9.DSCN0543: - 23/12/2004 by



Ice_lenses: - 23/12/2004 by

Appendix A
Laboratory Data Sheets

EBA Engineering Consultants Ltd.

MOISTURE CONTENT TEST RESULTS

Project: SRK 2004 Testing Services BH No: n/a
Hope Bay, Doris North Project SRK Job #: 1CM014.004.0050
Project No.: 1780108 Date Tested: October 20 - October 21, 2004
Location: Hope Bay, NU By: VG
Client: SRK Consulting

Test No.	Sample Number	Depth (m)	Wet+Tare	Dry+Tare	Tare	% Moisture Content
3763A-1	PD-01	n/a	3305.8	2728	1009.1	33.6
3763A-2	PD-02	n/a	4499.7	3160	964.3	61.0
3763A-3	PD-03	n/a	5554.7	4028	1254.6	55.0
3763A-4	PD-04	n/a	5596.1	4329	1266.1	41.4

EBA Engineering Consultants Ltd.

GRAIN SIZE DISTRIBUTION

Project: SRK 2004 Testing Services Hope Bay, Doris North Project

Project Number: 1780108

Client: SRK Consulting

Attention: Mr. Dylan MacGregor, Project Manager

Date Tested: October 25 - November 1, 2004

SRK Job Number ICM014.004.0050

Depth: n/a

Sample Number: PD-01

Lab Number: 3763A-1

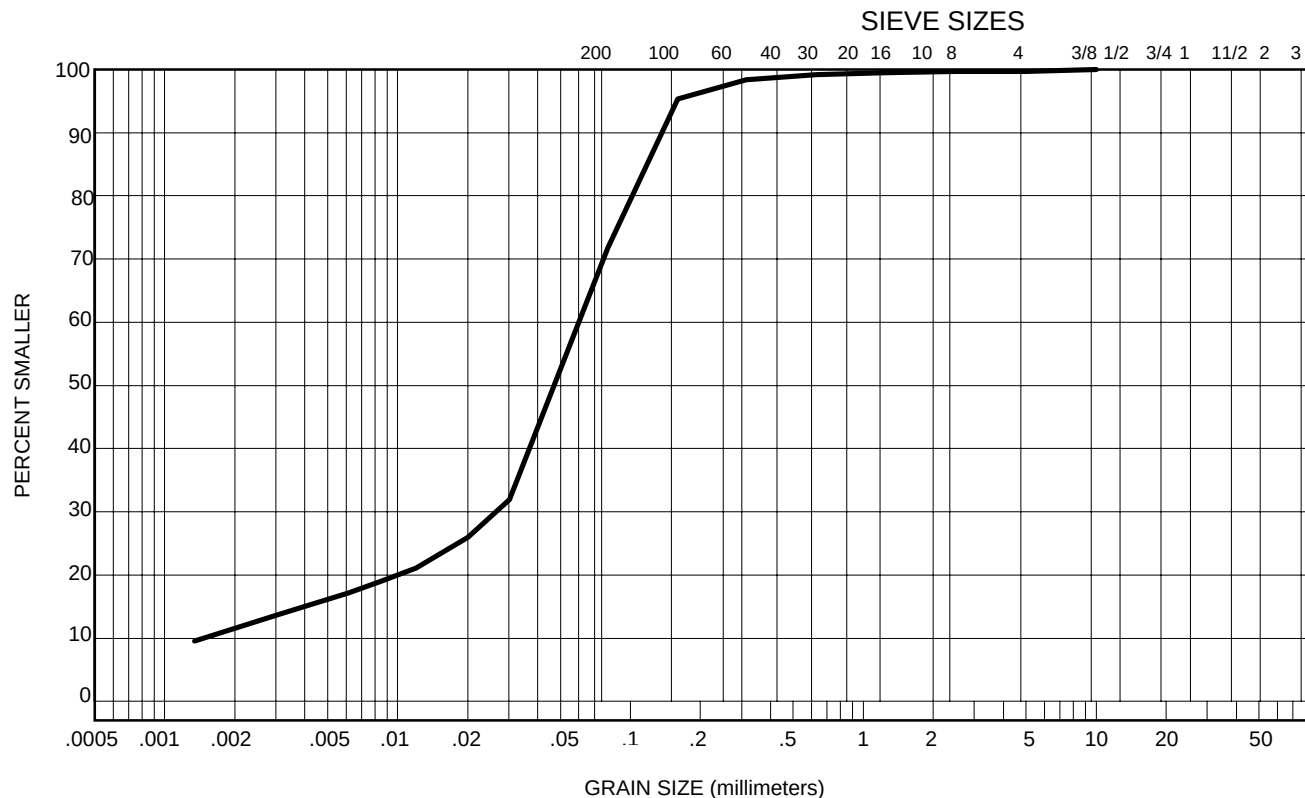
Soil Description: SILT, sandy, some clay, CL

Natural Moisture Content: 33.6%

Remarks: LL=20%, PL=16%, PI=4%

SIEVE	PERCENTAGE PASSING
40	
25	
20	
16	
12.5	
10	
5	
2.5	
1.25	100
0.63	99
0.315	98
0.16	95
0.08	71.8

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



Reviewed By: _____ P.Eng.

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EBA Engineering Consultants Ltd.

GRAIN SIZE DISTRIBUTION

Project: SRK 2004 Testing Services Hope Bay, Doris North Project.

Project Number: 1780108

Client: SRK Consulting

Attention: Mr. Dylan MacGregor, Project Manager

Date Tested: October 25 - November 1, 2004

SRK Job Number ICM014.004.0050

Depth: n/a

Sample Number: PD-02

Lab Number: 3763A-2

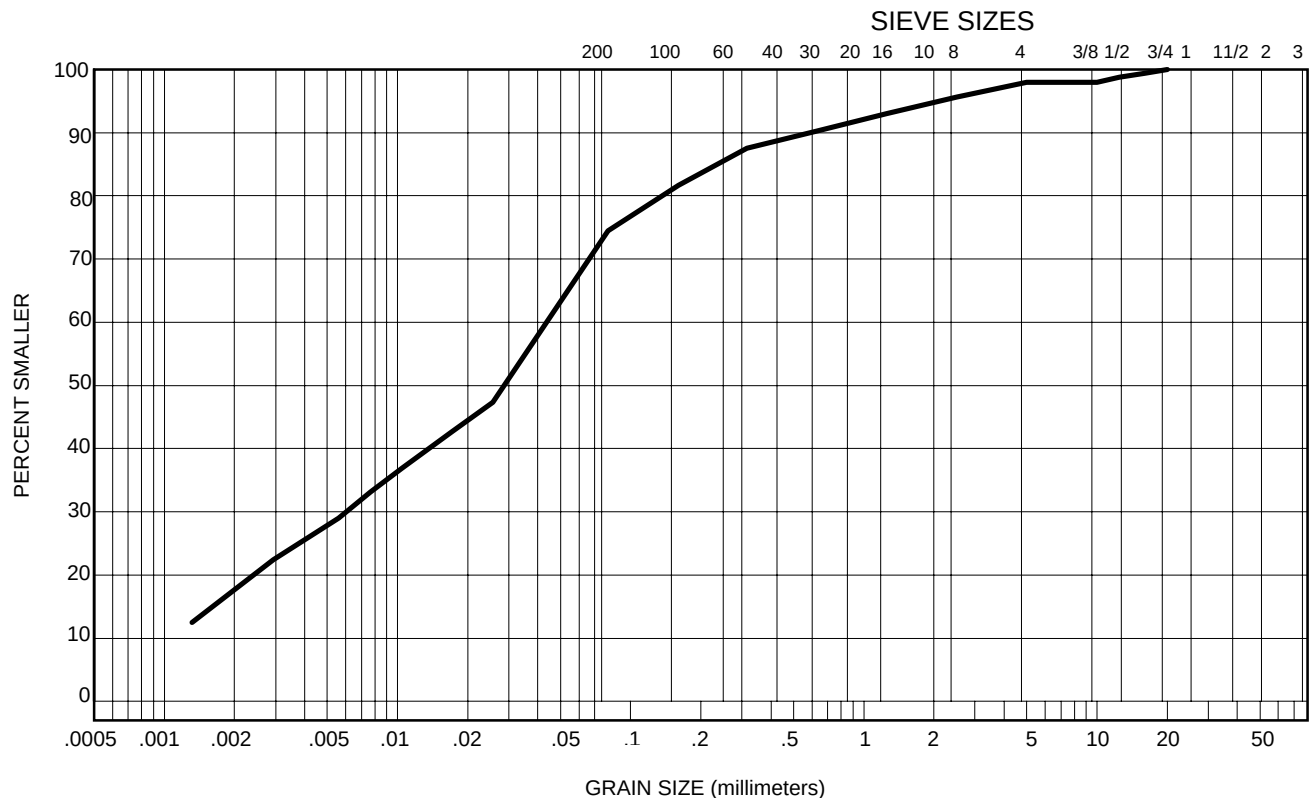
Soil Description: SILT, sandy, some clay, trace gravel, CL

Natural Moisture Content: 61.0%

Remarks: LL=28%, PL=23%, PI=5%

SIEVE	PERCENTAGE PASSING
40	
25	
20	100
16	99
12.5	99
10	98
5	98
2.5	96
1.25	93
0.63	90
0.315	88
0.16	82
0.08	74.4

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



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EBA Engineering Consultants Ltd.

GRAIN SIZE DISTRIBUTION

Project: SRK 2004 Testing Services Hope Bay, Doris North Project.

Project Number: 1780108

Client: SRK Consulting

Attention: Mr. Dylan MacGregor, Project Manager

Date Tested: October 25 - November 2, 2004

Borehole Number: 1CM014.004.0050

Depth: n/a

Sample Number: PD-03

Lab Number: 3763A-3

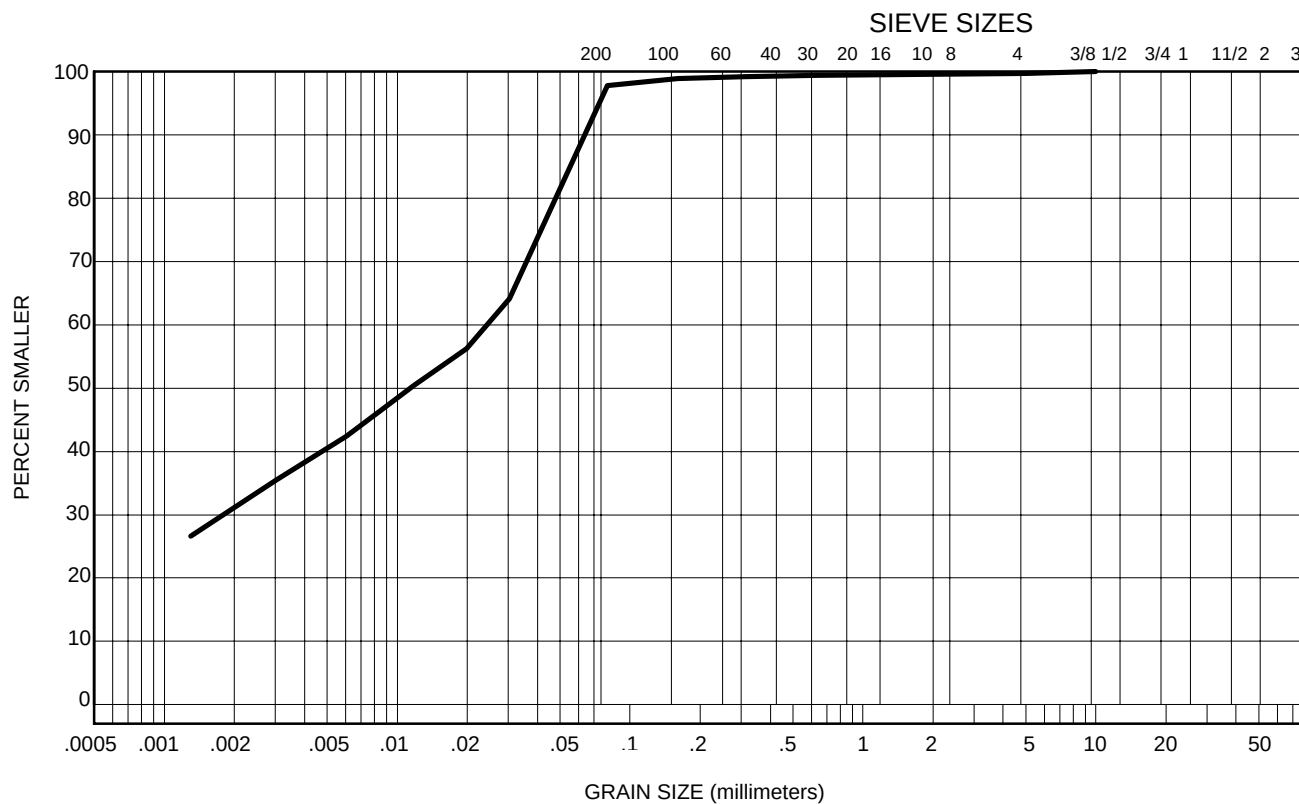
Soil Description: SILT, Clayey, trace sand, CL

Natural Moisture Content: 55.0%

Remarks: LL=37%, PL=23%, PI=14%

SIEVE	PERCENTAGE PASSING
40	
25	
20	
16	
12.5	
10	
5	
2.5	
1.25	100
0.63	99
0.315	99
0.16	99
0.08	97.8

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



EBA Engineering Consultants Ltd.

GRAIN SIZE DISTRIBUTION

Project: SRK 2004 Testing Services Hope Bay, Doris North Project

Project Number: 1780108

Client: SRK Consulting

Attention: Mr. Dylan MacGregor, Project Manager

Date Tested: October 25 - November 2, 2004

SRK Job Number: 1CM014.004.0050

Depth: n/a

Sample Number: PD-04

Lab Number: 3763A-4

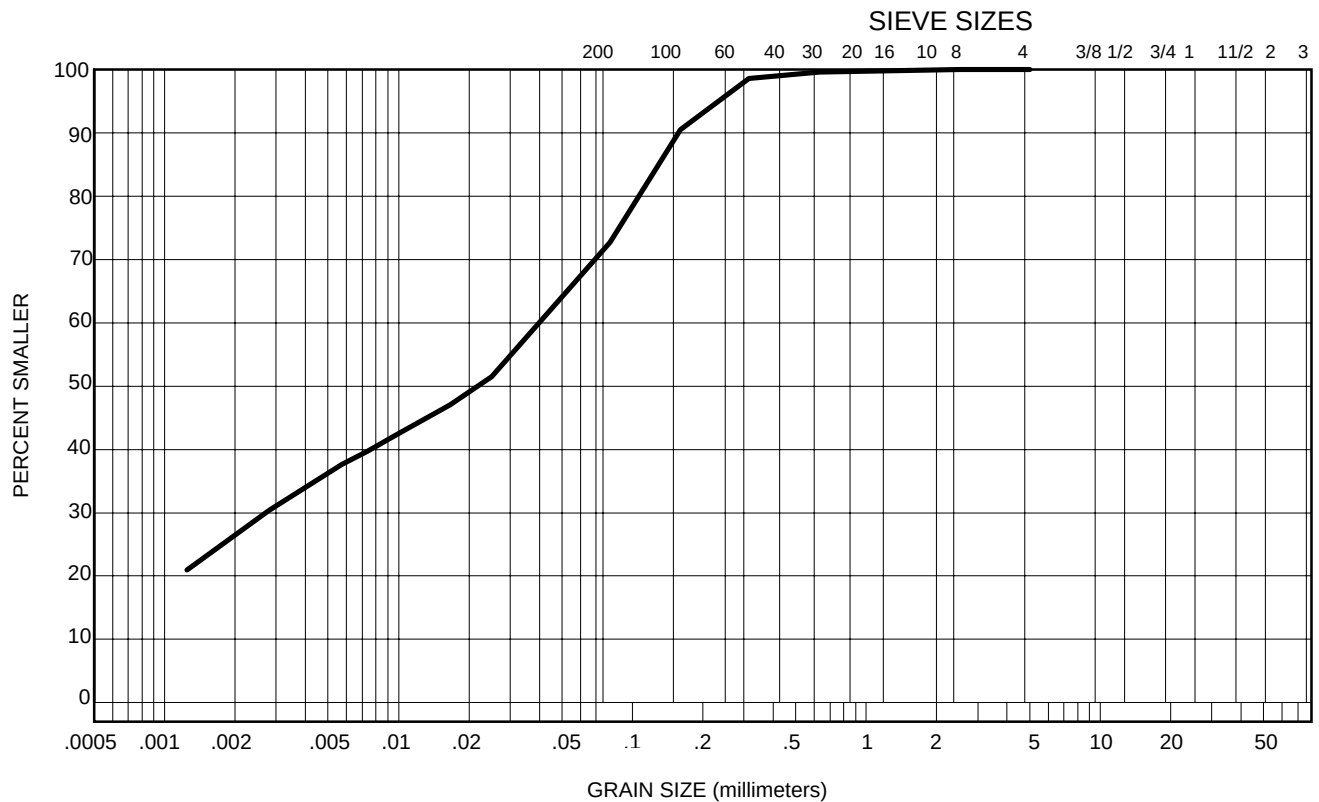
Soil Description: SILT, clayey, sandy, CL

Natural Moisture Content: 41.4%

Remarks: LL=28%, PL=16%, PI=12%

SIEVE	PERCENTAGE PASSING
40	
25	
20	
16	
12.5	
10	
5	
2.5	
1.25	
0.63	100
0.315	99
0.16	91
0.08	72.7

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



Reviewed By: _____ P.Eng.

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Atterberg Limits

Date Received: Job Number: 1780108
 Sample #: 3763A-1 (PD 01) Source: SRK Job Number 1CM014.004.0050
 ASTM D-2487, Unified Soils Classification System

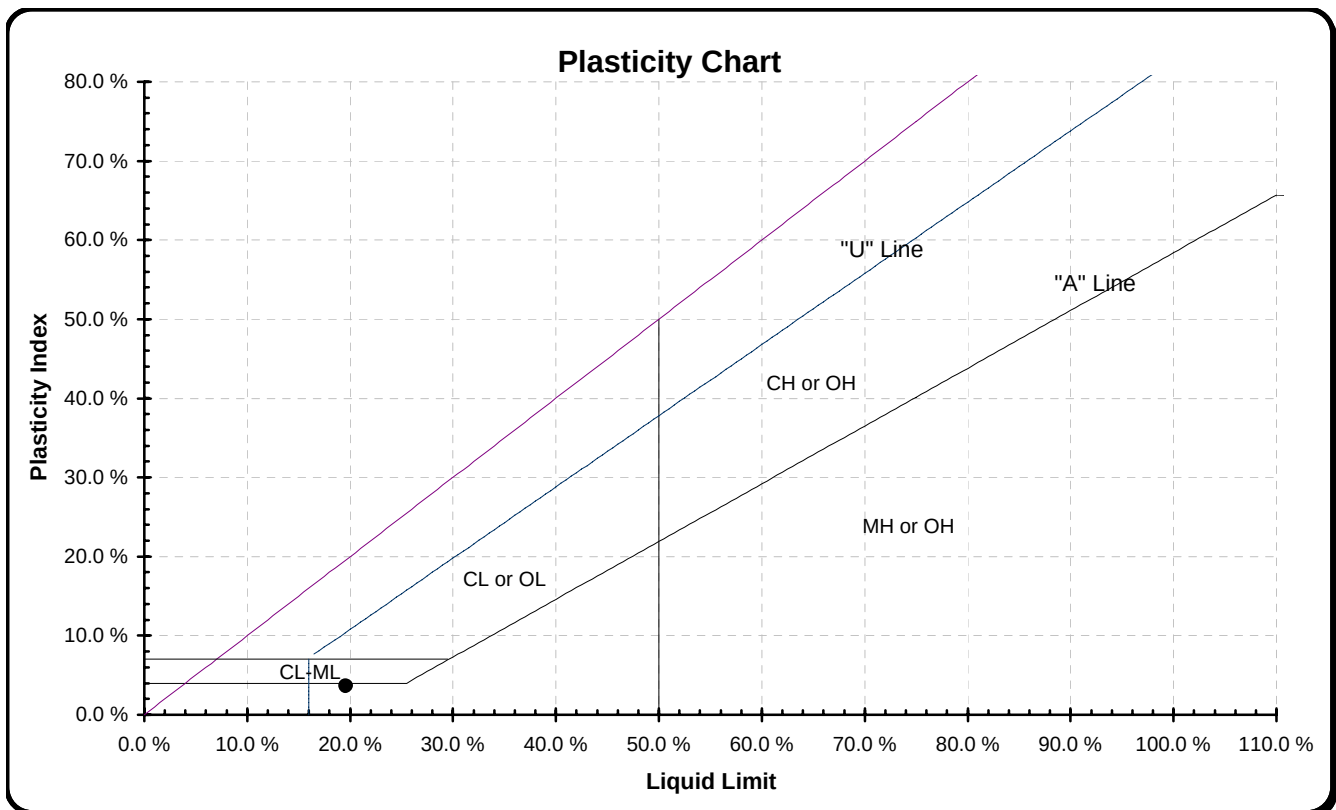
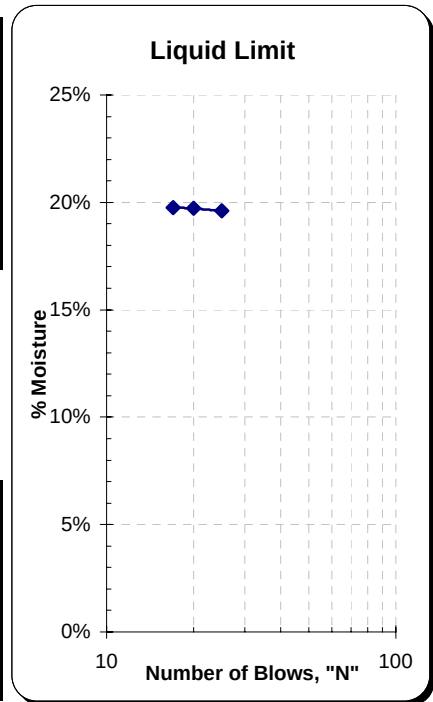
Liquid Limit Determination

	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:	33.80	30.00	24.70			
Weight of Dry Soils + Pan:	28.90	25.70	21.30			
Weight of Pan:	3.90	3.90	4.10			
Weight of Dry Soils:	25.00	21.80	17.20			
Weight of Moisture:	4.90	4.30	3.40			
% Moisture:	19.6 %	19.7 %	19.8 %			
N:	25	20	17			

Liquid Limit @ 25 Blows: 19.6 %
 Plastic Limit: 16.0 %
 Plasticity Index, I_p : 3.6 %

Plastic Limit Determination

	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:	13.40	14.50				
Weight of Dry Soils + Pan:	12.10	13.00				
Weight of Pan:	3.80	3.80				
Weight of Dry Soils:	8.30	9.20				
Weight of Moisture:	1.30	1.50				
% Moisture:	15.7 %	16.3 %				



Atterberg Limits

Date Received: **Job Number:** 1780108
Sample #: 3763A-2 (PD 02) **Source:** SRK Job Number 1CM014.004.0050
ASTM D-2487, Unified Soils Classification System

Liquid Limit Determination

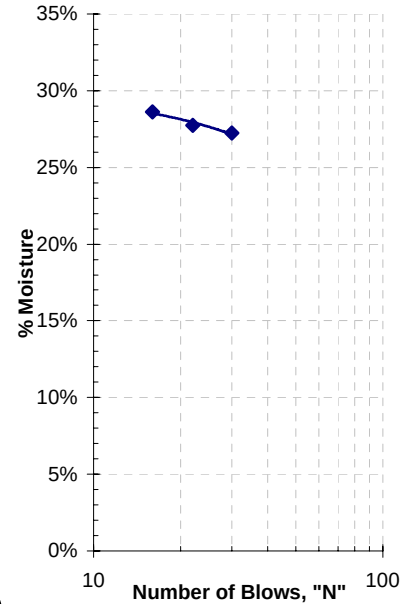
	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:	38.40	35.60	35.00			
Weight of Dry Soils + Pan:	31.10	28.80	28.10			
Weight of Pan:	4.30	4.30	4.00			
Weight of Dry Soils:	26.80	24.50	24.10			
Weight of Moisture:	7.30	6.80	6.90			
% Moisture:	27.2 %	27.8 %	28.6 %			
N:	30	22	16			

Liquid Limit @ 25 Blows: 27.6 %
Plastic Limit: 23.1 %
Plasticity Index, I_p: 4.5 %

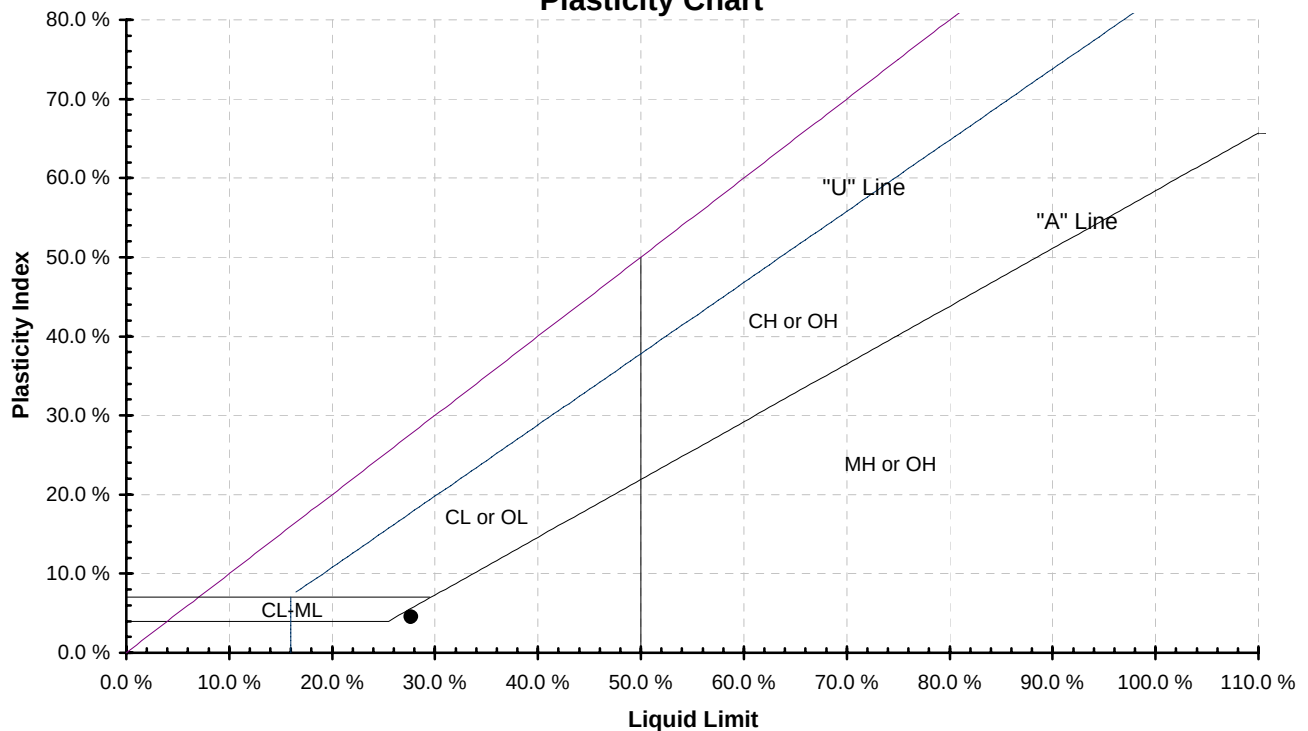
Plastic Limit Determination

	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:	15.40	16.80				
Weight of Dry Soils + Pan:	13.20	14.40				
Weight of Pan:	3.80	3.90				
Weight of Dry Soils:	9.40	10.50				
Weight of Moisture:	2.20	2.40				
% Moisture:	23.4 %	22.9 %				

Liquid Limit



Plasticity Chart



Atterberg Limits

Date Received: **Job Number:** 1780108
Sample #: 3763A-3 (PD 03) **Source:** SRK Job Number 1CM014.004.0050
ASTM D-2487, Unified Soils Classification System

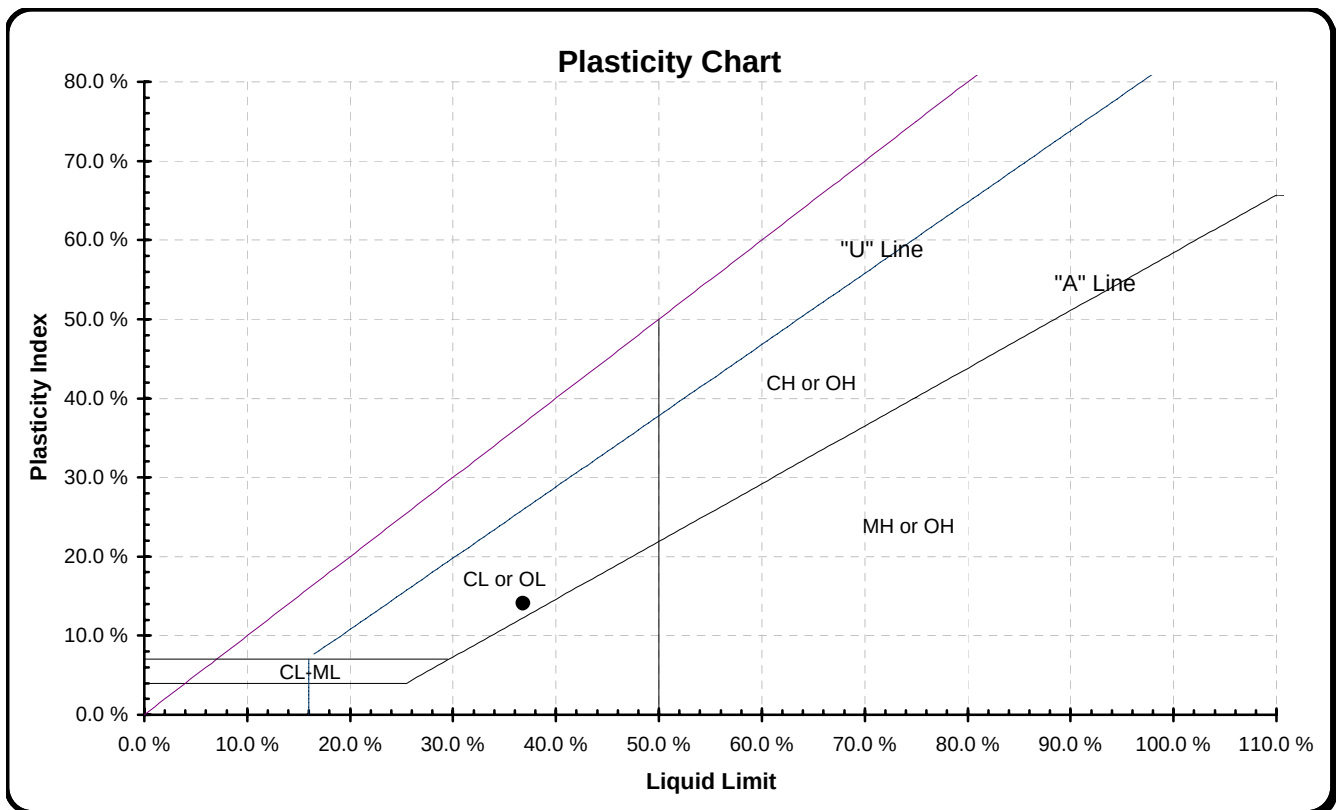
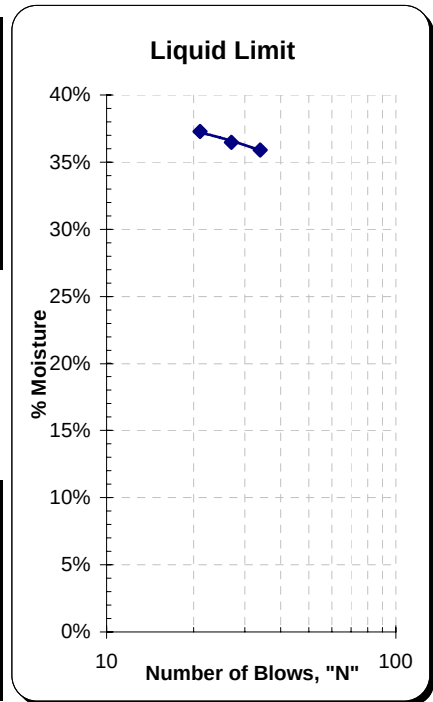
Liquid Limit Determination

	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:	32.20	32.00	27.30			
Weight of Dry Soils + Pan:	24.80	24.60	21.00			
Weight of Pan:	4.20	4.30	4.10			
Weight of Dry Soils:	20.60	20.30	16.90			
Weight of Moisture:	7.40	7.40	6.30			
% Moisture:	35.9 %	36.5 %	37.3 %			
N:	34	27	21			

Liquid Limit @ 25 Blows: 36.8 %
Plastic Limit: 22.7 %
Plasticity Index, I_p: 14.1 %

Plastic Limit Determination

	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:	19.30	16.90				
Weight of Dry Soils + Pan:	16.40	14.50				
Weight of Pan:	3.80	3.80				
Weight of Dry Soils:	12.60	10.70				
Weight of Moisture:	2.90	2.40				
% Moisture:	23.0 %	22.4 %				



Atterberg Limits

Date Received:

Job Number: 1780108

Sample #: 3763A-4 (PD 04)

Source: SRK Job Number 1CM014.004.0050

ASTM D-2487, Unified Soils Classification System

Liquid Limit Determination

	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:	28.10	29.90	31.70			
Weight of Dry Soils + Pan:	22.90	24.30	25.50			
Weight of Pan:	4.10	4.20	4.00			
Weight of Dry Soils:	18.80	20.10	21.50			
Weight of Moisture:	5.20	5.60	6.20			
% Moisture:	27.7 %	27.9 %	28.8 %			
N:	32	29	18			

Liquid Limit @ 25 Blows: 28.2 %

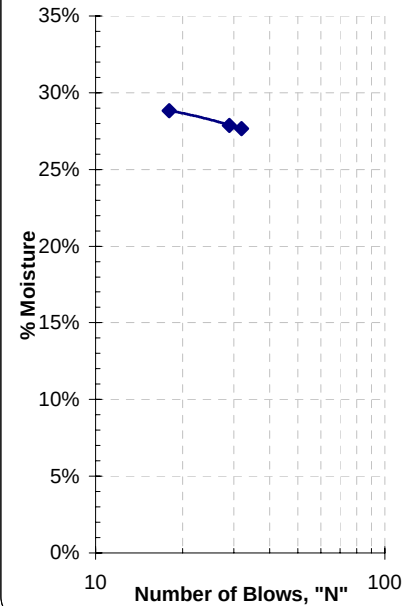
Plastic Limit: 16.2 %

Plasticity Index, I_p : 12.1 %

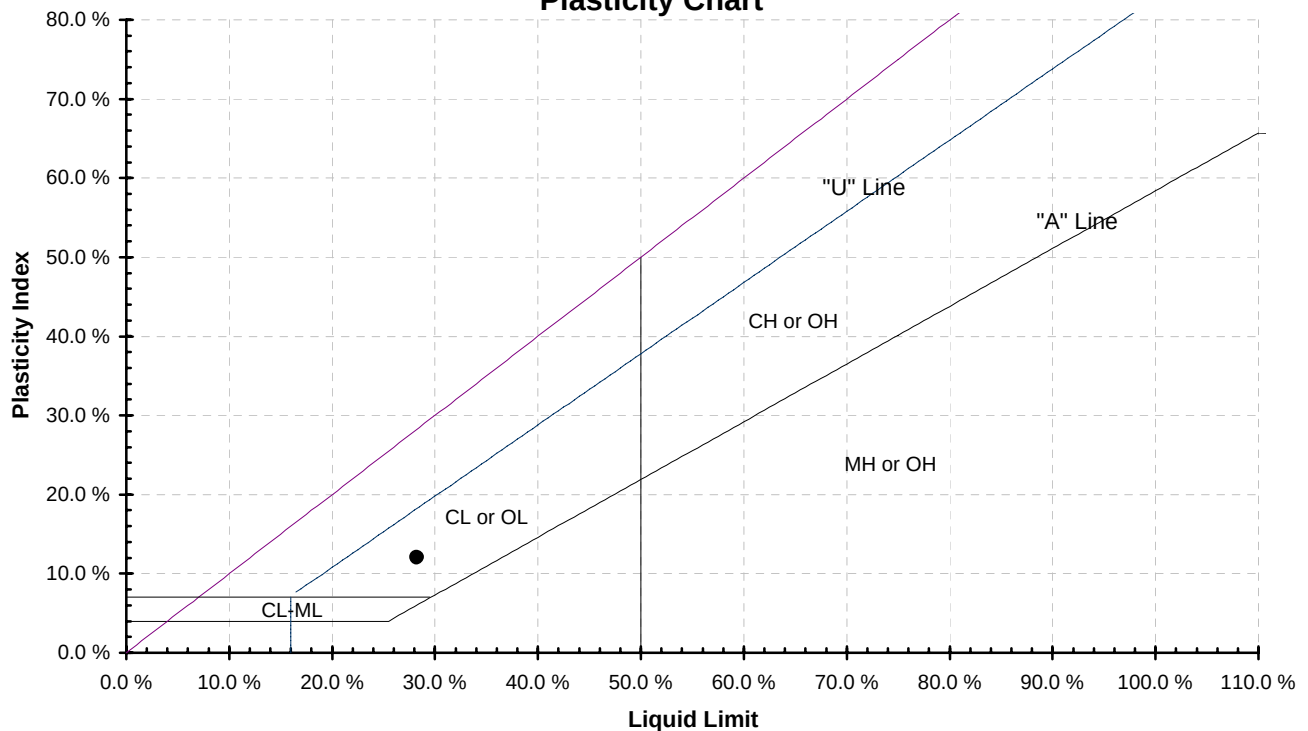
Plastic Limit Determination

	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:	13.70	15.50				
Weight of Dry Soils + Pan:	12.30	13.90				
Weight of Pan:	3.80	3.80				
Weight of Dry Soils:	8.50	10.10				
Weight of Moisture:	1.40	1.60				
% Moisture:	16.5 %	15.8 %				

Liquid Limit



Plasticity Chart



Appendix F

Sediment Resuspension Calculations

Technical Memorandum

To:	Brian Labadie	Date:	September 16, 2005
cc:	Project File	From:	Maritz Rykaart, Ben Wickland
Subject:	Re-Suspension of Shoreline Eroded Material in Tail Lake	Project #:	1CM014.006

1 Introduction

Re-suspension occurs in water bodies when the resistance of the bed material is overcome by action of the overlying water. The resistance of the bed is dependent on particle size, density, and cohesion. The action of the overlying water-wave action is dependent on the:

- fetch distance (distance of water over which waves may be generated), and
- wind speed, direction and duration.

Re-suspension affects the overall water quality due to increased total suspended solids (TSS) and potential total concentrations in the body of water.

As part of the Doris North Project, tailings will be deposited sub-aqueously into Tail Lake. The tailings will be contained in Tail Lake through the construction of two dams. The volume of water contained in Tail Lake will be managed by annually decanting water from Tail Lake until the lake can be returned to a flow-through system that will require no further management. This will result in a slow increase of the water level in the Tail Lake basin initially. As decanting progresses the water quality will improve and the water level will decrease to the original water elevation in Tail Lake. At that time the North Dam will be breached and the lake will return to a flow-through system.

During and after tailings deposition there are three sources for potential particle re-suspension in Tail Lake;

- *Existing lake bed sediments.* Based on background water quality data there is little evidence of re-suspension occurring in Tail Lake and this source can be disregarded. (Note: The water and load balance includes current background loadings of suspended solids irrespective of additional sources and this potential source is therefore already included in the water and load balance calculations.)
- *Deposited tailings.* The tailings will be deposited in the deepest areas of Tail Lake, and at any given time will be covered by at least 4 m of water. The minimum depth of the water cover required to prevent tailings re-suspension has been calculated as 2.42 m (SRK 2005a). Re-suspension of the tailings in Tail Lake is not likely to be significant.

- *Shoreline erosion sediments.* As the water level in Tail Lake rises, the submerged permafrost shoreline soils will thaw and some of these sediments may be eroded by wave action. Once the water level is lowered and the thaw zones are exposed, shoreline erosion will continue through overland runoff and wave action. A detailed description of these processes is given in SRK (2005b), together with an estimate of how much material may be eroded. These eroded sediments will be deposited in Tail Lake and will settle out over the entire lake bed, including the shallow fringes close to the shoreline.

The total load of sediments that may be mobilized by the above mechanisms were calculated to develop predictions of the potential effects on water quality in Tail Lake. This memorandum presents the calculations and results for total sediment loads to Tail Lake from re-suspension of sediments in Tail Lake.

2 Shoreline Erosion Material Re-suspension

2.1 Methodology

Samad and Yanful (2005) published a procedure to calculate shear stress on sediment beds from shallow wave action. This procedure was used to predict shear stresses and to estimate the amount of erosion and re-suspension of sediments due to wind and counter current flow action. This procedure is however in its infancy, and has only been verified for tailings bed material. Verification of the theory is limited to laboratory scale work and three short term and small scale field studies on actual tailings facilities. Nonetheless, this method offers the only realistic method for predicting sediment re-suspension in Tail Lake from sediments deposited by shoreline erosion.

SRK developed a spreadsheet model using the procedure described by Samad and Yanful (2005) and Yanful (2005) to calculate the likely range in sediment loads in Tail Lake through the process of bed erosion from shoreline erosion sediments.

The first step in the procedure is to calculate the maximum shear stress induced on the sediment bed by wave action. The shear stress exerted on the sediment bed results from different water velocities in the profile. The sum total of these two bed shear stresses is then used in the final step to calculate the total amount of bed erosion that can occur, which is equivalent to the re-suspension load.

2.2 Assumptions and Inputs

The primary input parameters used in the calculation are listed in Table 1.

Table 1. List of primary input values to re-suspension calculation

Parameter	Possible Range	Source
Water Depth	0.5 – 4.0 m	Topographical maps of Tail Lake
Fetch Distance	500 to 3,000 m	Topographical maps of Tail Lake
Wind Speed	6.11 to 11.11 m/sec	Cambridge Bay hourly wind speed data
Critical Shear Stress	0.058 to 0.120 Pa	Yanful (2005); Tables 2 & 3

The calculated bed erosion due to wave action and counter current flow is a function of the critical shear stress of the bed material. The critical shear stress is a site specific value that must be determined in the laboratory, using a flume test. Yanful (2005) report results of three such flume tests, all from tailings, as listed in Table 2. There does not appear to be a direct correlation between particle size and critical shear stress, which complicates application of this data to other materials such as the shoreline sediments at Tail Lake. Table 3 lists the typical Tail Lake shoreline material particle sizes as measured from samples collected during two drilling programs in 2004 and 2005 (SRK 2005c; SRK 2005d). The tailings particle size distribution is also listed in Table 3 for

completeness (SRK 2005e). Clearly the shoreline materials are on the fine side, and the average particle size is close to the Heath Steele tailings. Therefore, the average critical shear stress listed in Table 2 was adopted as the base case for Tail Lake bed erosion calculations. However, a sensitivity analysis was carried out to evaluate the effect of this assumption.

Table 2. Critical shear stress for tailings (Yanful 2005)

Site	d ₅₀ (mm)	Shear Stress (Pa)
Falconbridge Tailings	0.110	0.090
Heath Steel Upper Tailings	0.010	0.120
Heath Steel Lower Tailings	0.010	0.058
Average		0.089

Table 3. Tail Lake shoreline material particle size range

Site	d ₅₀ (mm)	d ₉₀ (mm)
SRK54(0.46-0.61)	0.0280	1.000
SRK54(3.18-3.34)	0.0043	0.060
SRK54(5.33-5.49)	0.0012	0.065
SRK55(0.1-0.2)	0.028	1.000
SRK55(0.35-0.45)	0.022	1.500
SRK56(0.14-0.20)	0.025	0.075
SRK56(0.3-0.4)	0.032	0.070
SRK56(0.5-0.6)	0.023	0.075
SRK53-2G(2.10-2.85)	0.008	0.075
SRK58-3E(4.10-4.40)	0.009	0.100
SRK58-2F(2.10-3.40)	0.004	0.058
SRK57-3C(4.28-4.68)	0.210	0.300
SRK54(8.26-8.41)	1.200	0.600
Doris North Project Tailings	0.067	0.150
Tail Lake Shoreline Soils - Minimum	0.001	0.058
Tail Lake Shoreline Soils - Average	0.017	0.371

Site specific wind data for the Doris North site is limited, and therefore wind speed data for Cambridge Bay has been used in the re-suspension calculations (SRK 2005g). The prevailing wind direction at Tail Lake is the north wind and the frequency of these winds, at different hourly average wind speeds are summarized in Table 4. These are the values that were used to calculate wind specific event based re-suspension loads. Since, the amount of re-suspension is a function of the wind speed, the total sum of re-suspension has been calculated by taking the sum of all the wind specific events, pro-rated according to the wind frequency distribution listed in Table 4.

The total open water period in Tail Lake, during which discharge will take place, and when re-suspension will occur is approximately 120 days. For the total annual sediment load calculation, we have assumed that an event can occur every seven days, i.e. the total annual load is equal to the sum total of 17 single events.

Table 4. Wind speed data used for re-suspension calculations

Wind Frequency (% Exceedance)	Wind Speed (km/h)	Wind Speed (m/sec)
50	22	6.1
40	26	7.2
30	29	8.1
20	34	9.4
10	40	11.1

2.3 Results

Results of the re-suspension calculations are illustrated in Figures 1 through 5, and presented in Tables 5 through 9. Each figure and table presents the potential total annual erosion load for any given fetch distance and wind speed, expressed as a bed erosion value in kg. This load is the sum total of material re-suspended down to a 4 m water depth, estimated from the Tail Lake stage curve (SRK 2005f). The erosion calculations were done in 50 cm slices, effectively representing a simplified 3-dimensional model, to maximize the accuracy within the model framework.

Figures 1 through 3 (and Tables 5 through 7) illustrate the effect that the increased water level in Tail Lake has on bed erosion. At the Full Supply Level (FSL) of 33.5 m, the minimum and maximum annual erosion associated with the minimum wind speed and fetch (as listed in Table 3 and 4) and the maximum wind speed and fetch, respectively are about 44,000 kg and 294,000 kg. At the proposed maximum operating water level in Tail Lake of 29.4 m, the surface area under 4 m is slightly greater than when the water is at 33.5 m, and therefore the minimum and maximum annual erosion loads increases to about 59,000 kg and 417,000 kg. At the flow-through elevation of Tail Lake, i.e. the current elevation where Tail Lake will be returned to when the dam is breached (28.3 m), the surface area under 4 m is even greater, and the erosion loads range between about 69,000 kg and 485,000 kg.

The effect of increasing wind speed and fetch is also clear from Figures 1 through 5. As the wind speed and fetch increases, the erosion load increases by factors of between 1.6 and 3.5.

Figures 4 and 5 (Tables 8 and 9) present the effect that the critical shear stress has on the erosion load calculation. Reducing the critical shear stress to the minimum recorded value of 0.058 Pa, results in a two-fold increase in the erosion load, whilst increasing the critical shear stress to 1.120 Pa, has the reverse effect of almost halving the erosion load.

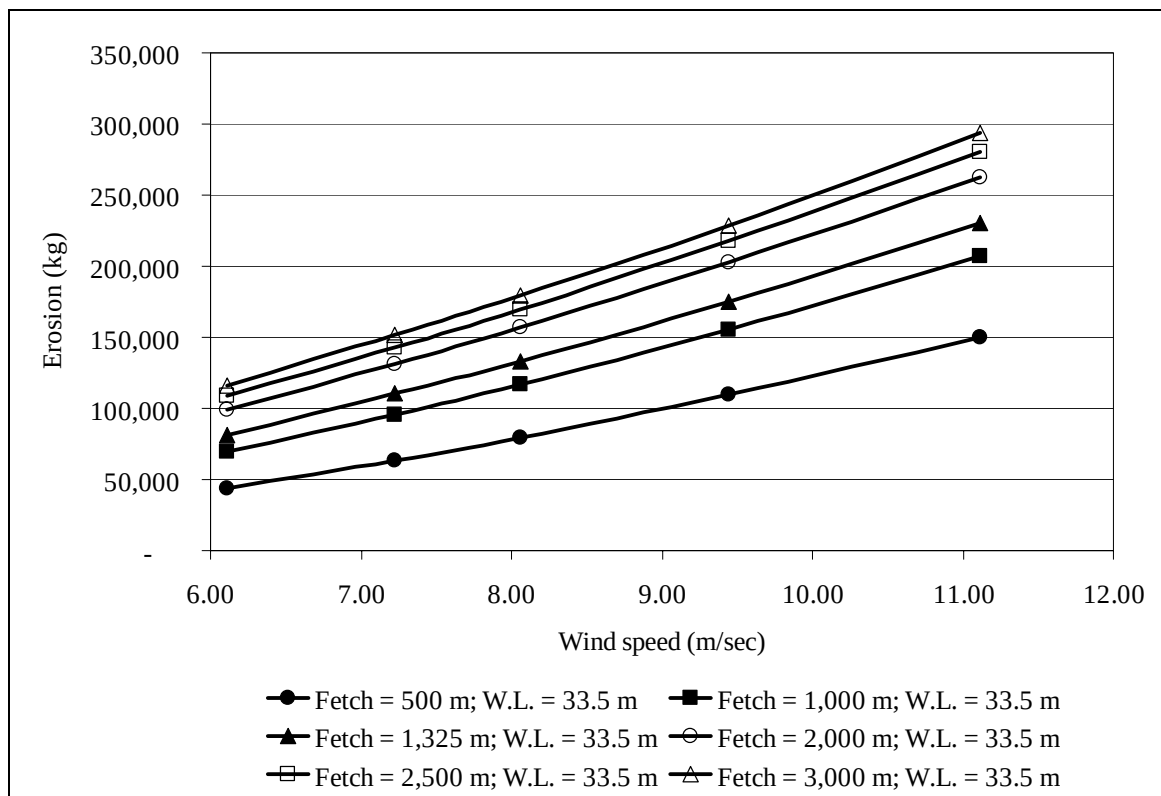


Figure 1. Re-suspension loads at the full supply level (FSL) of 33.5 m, using the average critical shear stress of 0.089 Pa.

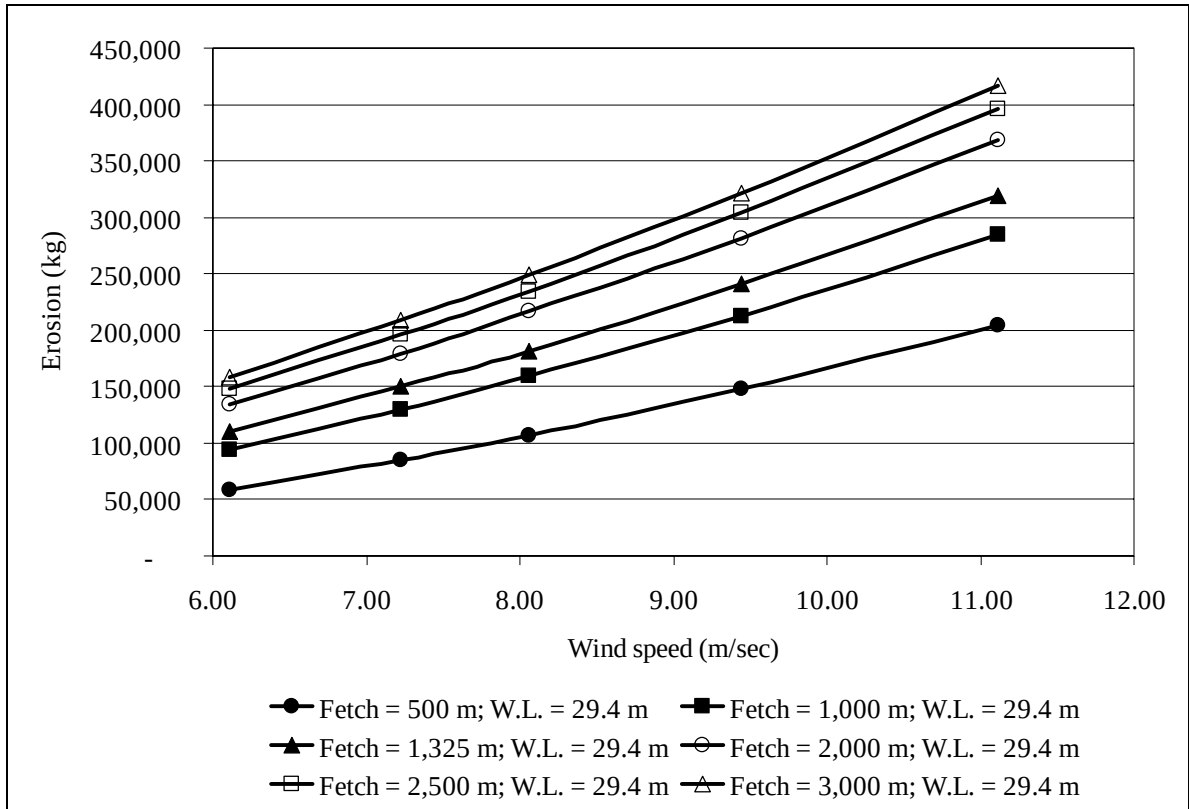


Figure 2. Re-suspension loads at the proposed maximum water level of 29.4 m, using the average critical shear stress of 0.089 Pa.

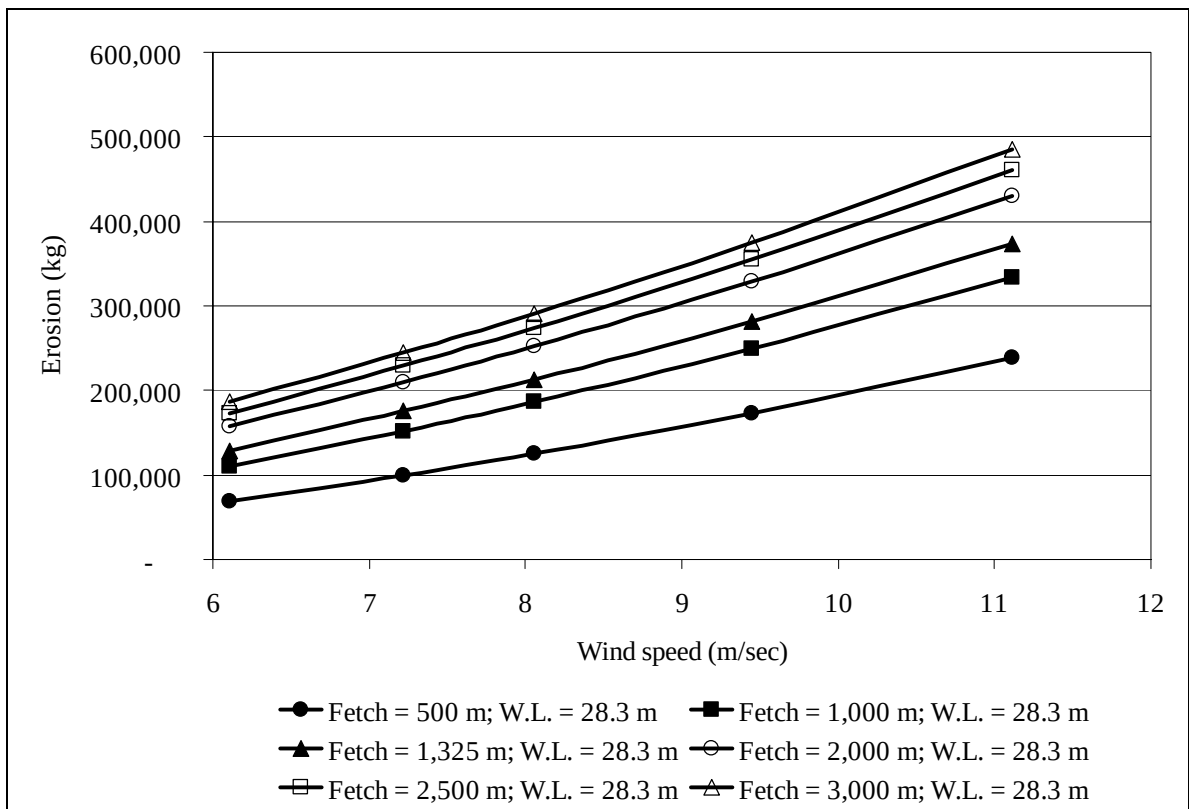


Figure 3. Re-suspension loads at the flow-through water level of 28.3 m, using the average critical shear stress of 0.089 Pa.

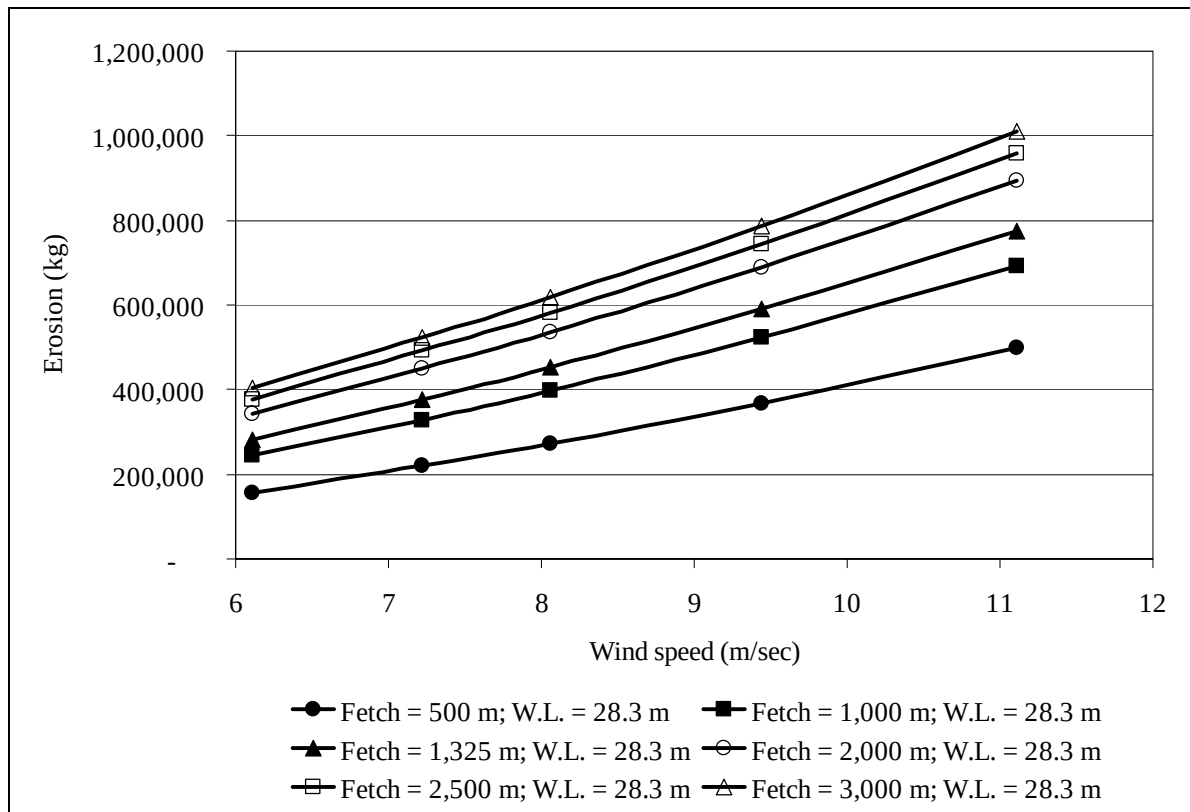


Figure 4. Re-suspension loads at the flow-through water level of 28.3 m, using the minimum shear stress of 0.058 Pa.

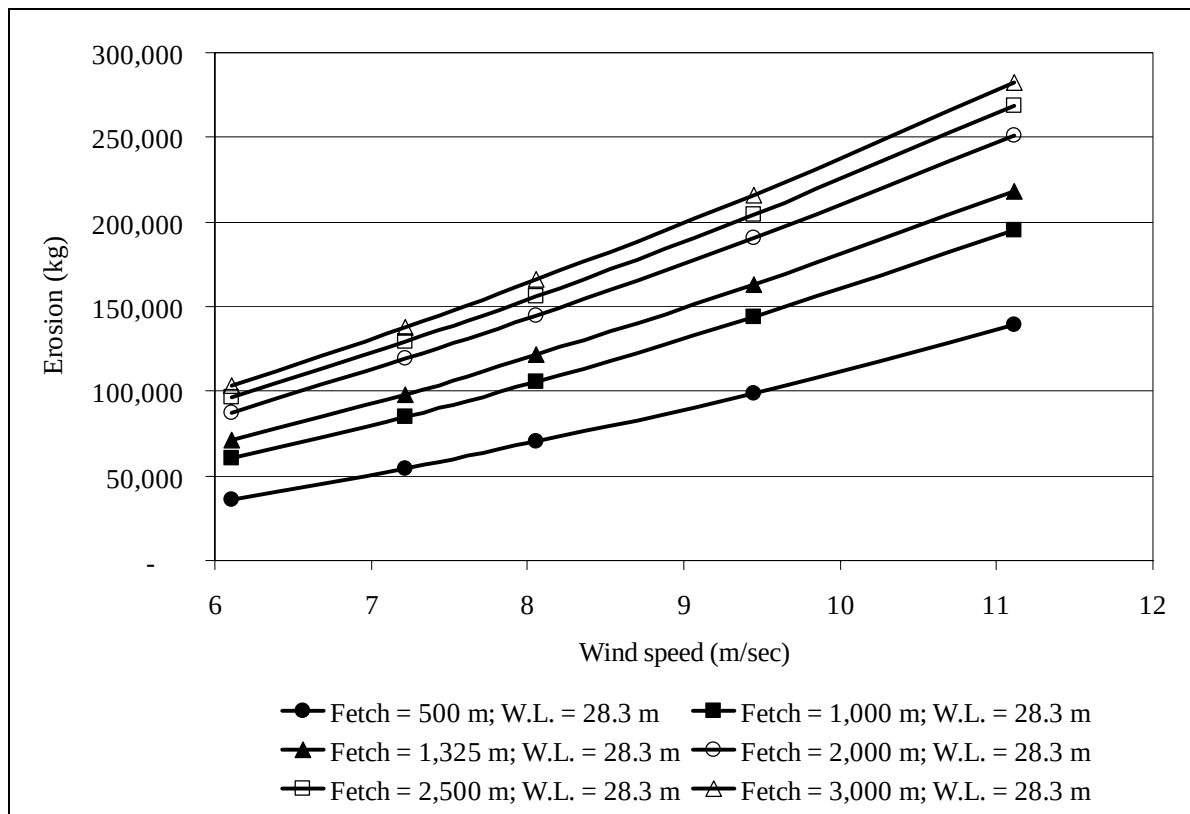


Figure 5. Re-suspension loads at the flow-through water level of 28.3 m, using the maximum shear stress of 1.120 Pa.

Table 5. Re-suspension loads (kg) at the full supply level (FSL) of 33.5 m, using the average critical shear stress of 0.089 Pa

Fetch (m)	Wind Speed (m/s)				
	6.11	7.22	8.06	9.44	11.11
500	44061	63612	79427	109443	150140
1,000	69652	95881	117343	155586	206824
1,325	81260	110353	133260	175194	230068
2,000	99211	131207	157186	202833	262901
2,500	108547	142567	169507	217475	280221
3,000	115979	151499	179184	228797	293710

Table 6. Re-suspension loads (kg) at the proposed maximum water level of 29.4 m, using the average critical shear stress of 0.089 Pa

Fetch (m)	Wind Speed (m/s)				
	6.11	7.22	8.06	9.44	11.11
500	58796	85262	106721	147882	204176
1,000	93637	129652	159367	212695	285163
1,325	109667	149943	181818	240974	319355
2,000	134865	179590	216393	281666	368935
2,500	148120	196130	234546	303819	395846
3,000	158792	209297	249020	321220	417169

Table 7. Re-suspension loads (kg) at the flow-through water level of 28.3 m, using the average critical shear stress of 0.089 Pa

Fetch (m)	Wind Speed (m/s)				
	6.11	7.22	8.06	9.44	11.11
500	69035	100079	125246	173457	239326
1,000	109886	152066	186833	249162	333652
1,325	128653	175778	213051	282057	373254
2,000	158096	210361	253265	329218	430347
2,500	173566	229578	274315	354732	461062
3,000	186001	244847	291049	374706	485273

Table 8. Re-suspension loads (kg) at the flow-through water level of 28.3 m, using the minimum shear stress of 0.058 Pa

Fetch (m)	Wind Speed (m/s)				
	6.11	7.22	8.06	9.44	11.11
500	157639	219927	272219	367803	499551
1,000	243571	327924	397739	522926	691259
1,325	282784	377251	453070	590440	773090
2,000	344159	450678	536751	689931	893078
2,500	377838	491331	581581	743527	957647
3,000	404930	524127	618431	787021	1010018

Table 9. Re-suspension loads (kg) at the flow-through water level of 28.3 m, using the maximum shear stress of 1.120 Pa

Fetch (m)	Wind Speed (m/s)				
	6.11	7.22	8.06	9.44	11.11
500	35667	54266	70071	98811	138962
1,000	60176	85118	105453	144048	194900
1,325	71134	98310	121525	162777	218484
2,000	87000	119048	144329	190349	251250
2,500	96185	129664	156081	204688	268794
3,000	103536	137771	165846	215587	282336

Table 10 provides a summary of the results and Table 11 list the recommended total annual re-suspension loads for use in water quality modeling.

Table 10. Total annual re-suspension loads (kg)

Water Level (m)	Scenario				
	33.5	29.4	28.3	28.3	28.3
Shear Stress (Pa)	0.089	0.089	0.089	0.058	1.120
Fetch = 500 m	77306	104220	122261	264724	67941
Fetch = 1,000 m	113072	154022	180479	384896	102530
Fetch = 1,325 m	128524	175978	206066	438086	117525
Fetch = 2,000 m	151308	208984	244402	518431	139123
Fetch = 2,500 m	163272	226679	264858	562092	150895
Fetch = 3,000 m	172680	240784	281115	597426	160156

Table 11. Recommended total annual re-suspension loads for use in water quality modeling

Scenario	Water Level (m)	28.3
	Shear Stress (Pa)	0.089
Lower Limit	Fetch = 500 m	122261
Base Case	Fetch = 1,325 m	206066
Upper Limit	Fetch = 3,000 m	281115

3 Conclusion

The calculations documented in this technical memorandum demonstrate the potential range of bed erosion that may occur at Tail Lake. For water quality predictions it is recommended that the conditions listed in Table 11. This represents bed erosion at the long-term, steady state flow-through elevation of 28.3 m, using an average critical shear stress value.

4 References

Samad, M.A., and Yanful, E.K. 2005. *A design approach for selecting the optimum water cover depth for sub aqueous disposal of sulfide mine tailings*. Canadian Geotechnical Journal. 42: pp. 207-228.

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SRK Consulting (Canada) Inc. 2005b. *Potential Shoreline Erosion Processes at Tail Lake, Doris North Project, Hope Bay, Nunavut, Canada*. Technical Report No. 1CM014.006 submitted to Miramar Hope bay Limited, September.

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Yanful, E.K. 2005. *Short Course Notes: Design and management of water covers for mitigating acid generation from reactive sulphide mine wastes*. Securing the future. International conference on Mining and the Environment, Metals, and Energy Recovery. 27 June – 1 July 2005, Skelleftea, Sweden.

Appendix G
Shoreline Soil Settling Test Results

Technical Memorandum

To:	Brian Labadie	Date:	October 12, 2005
cc:	Project File	From:	John Chapman
Subject:	Doris North Project, Hope Bay - Tail Lake Perimeter Soil Settling Tests	Project #:	1CM014.006

1 Introduction

1.1 Terms of Reference

Permafrost soils around the perimeter of Tail Lake may thaw as result of the expected rise in water level in the lake due to tailings deposition. The thawed soils may become susceptible to re-suspension due to wave action while submerged. Subsequent to operations, the water level in Tail Lake will be lowered to its original elevation. At that time, the soils above the waterline that have been thawed will be subject to physical erosion caused by overland runoff and wave action impacting on the shoreline. This erosion may lead to sloughing and slumping of thawed soils at steep gradients which may further exacerbate particulate transport to Tail Lake.

The combined effects of physical erosion and re-suspension by wave action may increase the suspended solids concentration in Tail Lake. This memorandum presents results for testing conducted to assess suspended solids release to Tail Lake from soils sampled along the shoreline of Tail Lake, and examines the potential effects on water quality in Tail Lake.

1.2 Background

Calculations have been completed that estimated sediment re-suspension and erosion loadings from three possible mechanisms as follows:

- *Re-suspension of tailings by wave action.* The calculations considered the depth of the water cover; the tailings solids size distribution and the prevailing wind fetch and speed (SRK 2005a).
- *Physical shoreline erosion from overland runoff and wave action.* Calculations completed to estimate the potential sediment transport due to shoreline erosion processes considered only the mass transport that occurs as a result of the physical process of erosion (SRK 2005b).
- *Shoreline material re-suspension by wave action.* These calculations address soil that had been eroded from the shoreline and has accumulated on the bed of Tail Lake and the shallow fringes near the lake shore (SRK 2005c).

Due to the depth of the water cover that will exist over the tailings, the effect of wave action on re-suspension of tailings will be negligible (SRK 2005a).

The estimated total solids loadings to Tail Lake generated from shoreline erosion and through re-suspension, before any correction for settling, derived from these calculations are summarized below in Table 1.1.

Table 1.1 Summary of Estimated Solids Loadings to Tail Lake at 28.3 m

Case	Loading by Physical Shoreline Erosion (kg/year)	Loading Resulting from Re-Suspension of Eroded Material (kg/year)	Estimated Total Annual Loading (kg/year)
Base Case	2,846,891	206,066	3,052,957
Upper Limit	7,354,467	281,115	7,635,582
Lower Limit	948,964	122,261	1,071,225

Under the proposed management strategy, water will be discharged from Tail Lake when tailings deposition commences so that the water level in Tail Lake will rise slowly. Thawing of the permafrost will commence only after inundation, and thawing will likely be limited to the soils directly inundated by rising water. Therefore, during the short operational period of two years, while the water level in Tail Lake is still rising, it is anticipated that shoreline erosion will be limited because thawing has to occur before soils will become erodible. As the soils that have become inundated with the increased water elevation thaws, erosion will accelerate to the levels indicated in the above table. Consequently, the most significant solids release will occur only when the water level recedes, leading to sloughing of the steeper slopes, and to physical shoreline erosion of the more gentle slopes through overland runoff and wave action. The effects of these loadings will be observed only after the water level in Tail Lake has been lowered to its current outflow elevation, resulting in exposing the thawed soils.

Furthermore, it is important to note that the calculations for solids re-suspension by wave action assume that the sediments are exposed and readily available for mobilization. In reality, as the water level increases, the shoreline will be inundated with the existing vegetation remaining intact. The vegetation will initially provide some protection against solids mobilization and suspension, and the calculations are likely to overestimate the actual loadings from this source during the operational period.

Initially, once erosion commences, the volume of water contained in Tail Lake will provide substantial dilution of the solids entering the lake. In time, the suspended solids in the lake may build-up and concentrations may increase gradually. Therefore, in order to estimate the maximum total solids concentrations that may result in Tail Lake, it is necessary to evaluate the mass balance for Tail Lake at steady state flow-through conditions.

At steady state, the total loading to Tail Lake from physical shoreline erosion and wave re-suspension will equal the sum of the suspended solids loads removed from Tail Lake due to settling from the water column and that transported (flushed) from Tail Lake in the outflow. The maximum total solids concentrations that could result can be estimated by assuming the estimated shoreline erosion rates are sustained indefinitely, i.e. the loadings of solids to Tail Lake do not change with time, and steady state conditions will develop at some time in the future. This is conservative since the loadings from erosion are likely to increase rapidly initially to the peak values given in Table 1.1, and will then decrease over time until a new stable shoreline is established.

For steady state conditions it can be shown that the 'available dilution' for the annual load of solids into Tail Lake is equal to the volume of annual water inflow to Tail Lake. Table 1.2 provides estimates of the inflow to Tail Lake and the equivalent total solids concentrations that may result in Tail Lake under steady state conditions for each of the loading scenarios given in Table 1.1. The estimated concentrations equal the total annual loading divided by the annual flow and represent the concentrations **without** any correction for solids settling from the water column.

Table 1.2 Estimated Steady State Total Solids Loading Concentration in Tail Lake

Description	Units	Range	
Runoff yield	mm/year	111	180
Flow into Tail Lake	m ³ /year	500,000	812,000
TSS Concentration*			
Base Case	g/L	6.1	3.8
Upper Limit	g/L	2.1	1.3
Lower Limit	g/L	15.3	9.4

Note: * Total loading not corrected for settling

As shown, for the base case conditions, the maximum solids concentration before correction for settling is estimated to be about 6.1 g/L for the low-yield conditions (111 mm/year), and about 3.8 g/L for the high-yield estimate. The estimated upper limit of the total solids loading is about 15.3 g/L, at the low-yield conditions of 111 mm/year. As noted before, these estimates assume that the rate of shoreline erosion remains constant indefinitely. It is however important to note that:

- First, the maximum solids loadings will result only after the water level in Tail Lake has been lowered from the maximum elevation to the natural outflow elevation.
- Second, the estimated total solids concentrations shown in Table 1.2 will result only if the shoreline erosion rate is maintained at a constant rate until steady state conditions are reached. Initially, the water in Tail Lake will provide considerable dilution so that, steady state conditions would be attained only after several years. It is unlikely that shoreline erosion rates will be sustained in the longer term. It is more likely that, once the water level has been lowered, permafrost conditions will be re-establish in the affected areas, and sediment loadings will gradually decrease over time.
- Third, these concentrations need to be corrected for the effects of settling and solids retention within Tail Lake.

The effects of settling on the total suspended solids were determined by completing a series of settling tests on soil samples collected from perimeter soils representing a range of clay and fines contents. In the following sections, the test procedures are first presented and the test results discussed. The results are then used to estimate the effect of settling rates on suspended solids and water quality in Tail Lake.

2 Test Methods and Sample Selection

2.1 Sample Selection

Three drill core samples were selected from the summer 2004 and winter 2005 field programs at Tail Lake (SRK 2005d; SRK 2005e). The selected samples represent soils along the perimeter of Tail Lake that could be subject to shoreline erosion and wave re-suspension. Samples were specifically selected to cover the range of clay size particles found along the Tail lake shoreline. The sample numbers and size distributions are summarized in Table 2.1. Samples were tested as described in the next section.

Table 2.1 Sample Selection and Size Distribution

Sample	Percent passing 74 µm (silt)	Percent passing 2 µm (clay)
SRK-51 3L 2E (2.12 t 2.6)	95 %	15 %
SRK-58 3L (4.1 to 4.4)	85 %	32 %
SRK-58 4L	94 %	40 %

2.2 Methods

2.2.1 Settling Test Procedure

The settling tests were carried out as follows:

- Two sub-samples of 40 g (wet weight) were split from each of the moist soil samples, and labeled as -A and -B samples respectively.
- Each sub-sample was suspended in about 100 ml of distilled water to ensure that any clots or agglomerates were broken up prior to testing. Water was then added, while mixing well, to bring the total slurry volume to 2.0 L in a 2.0 L graduated cylinder.
- The solids – water interface was recorded at regular time intervals (1, 2, 4, 8, 24 etc. hrs) to determine the settling rate of the solids. Digital photographs were obtained at each measurement as appropriate. Measurements were continued for each test until the all tests were terminated.
- Water samples were removed from the top of the water column from each of the first tests (A-samples) after a period of 24 hours. Only water above the solids – clear supernatant interface was sampled.
- Water samples were obtained from the -B tests after 72 hours.

The water samples collected at 24 hours and at 72 hours were submitted for analysis as described below.

2.2.2 Analytical Procedures

Solids Analyses

Each of the solids samples were submitted for elemental analysis by Inductively Coupled Plasma (ICP) analysis, and for total sulphur, sulphate sulphur and neutralization potential.

Sub-samples were also submitted for X-Ray Diffraction (XRD) analysis to identify clays and other crystalline phases present.

Supernatant Samples

All water (supernatant) samples were submitted for dissolved metals, total metals, and total suspended solids. Dissolved and total metals were analyzed by ICP MS method, to 'Ultra Trace Level'.

3 Results and Discussion

3.1 Settling Test Conditions

The settling tests were completed on wet samples. The equivalent initial solids concentrations, on a dry weight basis, were calculated from the initial moisture content and are summarized in Table 3.1. As shown in the last column of the table, the tests were completed within the range of the upper total solids concentration estimated for the upper limit of solids loading to Tail Lake (see Table 1.2) at steady state, low yield conditions.

Table 3.1 Sample Selection and Size Distribution

Sample	Sample Wet Wt. (g)	Moisture (%)	Dry Weight (g)	Total Solids Concentration (g/L)
SRK-51 3L 2E (2.12 t 2.6)	40	24.8	30.1	15.0
SRK-58 3L (4.1 to 4.4)	40	23.7	30.5	15.3
SRK-58 4L	40	34.1	26.4	13.2

3.2 Solids Composition

The acid base account test results for the samples are summarized in Table 3.2. The results indicate that the soil samples have a very low sulphide mineral content resulting in a low acid generation potential (AP). Overall, the excess neutralization potential (NP) of the soils indicate that they are not expected to be net acid generating.

Table 3.2 Acid Base Account Test Results

Sample	pH	Total (Wt.%)	SO ₄ -S (Wt.%)	Sulphide-S (Wt.%)	Max. AP*	NP*	NNP*
SRK-51 3L	7.5	0.06	0.05	0.01	0.3	13.2	12.9
SRK-58 3L	7.7	0.08	0.04	0.04	1.1	10.2	9.1
SRK-58 4L	7.6	0.12	0.10	0.02	0.8	11.2	10.4

Note: * in units of kg CaCO₃ eq/tonne

The complete elemental analyses are provided in Attachment 1, and are summarized in Table 3.3. The soils generally have low base metal contents, and mercury was found to be at or below a detection limit of 0.01 ppm.

The XRD results (also provided in Attachment 1) are summarized in Table 3.4 and indicate that the clay minerals consist predominantly of illite and mica. The results suggested the presence of pyrite; however, as noted above, the actual sulphide mineral content of the soils is very low. XRD-analysis is a semi-quantitative method generally used to identify crystalline mineral phases and cannot be used to quantify trace minerals.

Table 3.3 Summary of Elemental Analyses

Element	Units	SRK-51 3L	SRK-58 3L	SRK-58 4L
Al	%	2.19	1.84	2.12
As	ppm	2	1.4	1.9
Ca	%	0.66	0.72	0.74
Cd	ppm	0.1	0.1	0.1
Co	ppm	16.1	13.2	15.2
Cr	ppm	85.8	62.6	78.6
Cu	ppm	36.8	31.5	36.5
Fe	%	3.24	2.76	3.17
Hg	ppm	<0.01	<0.01	0.01
K	%	0.72	0.57	0.67
Mg	%	1.74	1.44	1.7
Mn	ppm	438	399	442
Mo	ppm	1.5	1.1	1.3
Na	%	0.828	0.731	0.862
Ni	ppm	37.5	29.5	36.4
Pb	ppm	9.9	10.9	9.3
Zn	ppm	80	76	80

Table 3.4 Mineralogical Composition of the Soils Estimated by XRD

Sample ID	SRK-51L 3L	SRK-58 3L	SRK-58 4L
Whole Rock Composition by Weight %			
Quartz	41	46	46
K-Feldspar	9	8	8
Plagioclase	30	28	29
Amphibole	1	1	1
Calcite	0	0	0
Ankerite	0	0	0
Dolomite	0	0	0
Gypsum	0	0	0
Halite	0	0	0
Siderite	0	0	0
Pyrite	3	3	3
Hematite	0	0	0
Total Clay	16	14	13
Total	100	100	100
Relative Clay Content by Wt. %			
Smectite	4	2	4
Illite / Smectite *	0	0	0
Illite & Mica	66	62	60
Kaolinite	7	9	7
Chlorite	23	27	29
Total	100	100	100

3.3 Settling Rate and Density

The settling test observations are provided in Attachment 2. Images of the water columns at various time intervals are provided in Photos 1 to 7, contained in Attachment 2. As shown, the supernatant cleared within 24 hours for all tests, and was very clear at 72 hours. The estimated slurry density of the settled fraction, expressed as a percent solids content within the settled fraction, for each time stage is summarized in Table 3.5. The 72 hour settled densities ranged from 23 percent to 62 percent solids (by wt.), and varied inversely with the initial clay particle size content (i.e. the higher the clay content the lower the settled solids content). The results indicate that the solids settled to a small net volume, and do not remain suspended. Furthermore, any suspended solids are likely to accumulate at depth on top of the tailings to form a thin layer over the tailings.

Table 3.5 Estimated Solids Content in Settled Solids Zone (Below Settled Interface)

Sample	Settled Density (Solids Content % (wt))							
	0 hr	1 hr	2 hr	4 hr	8 hr	24 hr	48 hr	72 hr
SRK-51 3L 2E (2.12 t 2.6)	1.5	43	47	51	56	62	62	62
SRK-58 3L (4.1 to 4.4)	1.5	1.5	28	22	25	28	30	34
SRK-58 4L	1.3	12	13	14	15	19	22	22

3.4 Totals Suspended Solids and Water Quality

Summaries of the supernatant water quality parameters are provided in Table 3.6 below. Complete results are provided in Attachment 3.

The total suspended solids (TSS) were at or below detection the detection limit of 1 mg/L for all tests after 24 hours. The method utilized a 1 µm glass fibre filter medium.

The differences between the total and dissolved analyses were also used to calculate the TSS concentration. Since samples for total metals are not filtered, and samples for dissolved metals are

filtered to a filter size of 0.45 µm, the calculated suspended solids estimate represents all particles greater than 0.45 µm in size. The results are included in Table 3.6.

The calculated TSS for sample SRK-51 3L suggests that the suspended solids had increased from 24 hours to 72 hours. However, these tests were completed in two separate vessels and the 24 hour water sample was not obtained from the same water column as the 72 hour sample. In fact, the photographs clearly illustrate that the one test had reached a clear supernatant before the other. The turbidity measurements supported this observation. For the remaining two tests, the calculated TSS decreased from above 10 mg/L at 24 hours to less than 5 mg/L at 72 hours.

Overall, the settling tests indicate that the TSS decreased to 5 mg/L or less within a 72 hour period, with the residual particles within the size range of 0.45 µm to 1 µm.

The water quality results indicate that the soils may result in increased metal concentrations for some elements, including copper and aluminium. In general, the total concentrations for these metals represent predominantly particulate matter. Concentrations of other metals, including mercury, arsenic, cadmium and zinc, are not likely to be affected significantly. The implications of the observed copper and aluminium concentrations are discussed further in Section 4.

The composition of the suspended solids was also estimated from the total and dissolved metals analyses. The results are shown in Table 3.7 and indicate that suspended solids consist predominantly of aluminosilicates. The sodium content may however be overestimated, since the porewater contained high concentrations of dissolved sodium. Even a small error in the sodium analysis may lead to a significant error in estimating the overall solids composition when compared to the other constituents. Nonetheless, the results are consistent with clay mineralization. The suspended solids also contain some iron. At the particulate matter size distribution, the iron is likely present in a colloidal form, possibly as an oxy-hydroxide. As such, it is possible that some of the suspended metals, including copper, are present in the suspended solids as sorbed species.

Table 3.6 Supernatant Water Quality Results

Sample	Time	TSS		Turbidity	Al	As	Ca	Cd	Cu	Fe	Hg	Zn
		Assay ($< 1\mu\text{m}$) (mg/L)	Calc. ($> 0.45\ \mu\text{m}$)* (mg/L)									
	hr			NTU	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
SRK-51 3L												
Dissolved	24	-	-	-	49	<0.5	2193	<0.05	0.5	18	0.1	<0.5
Total	24	<1	2.9	17	562	0.6	2213	<0.05	1	622	<0.1	1.2
Dissolved	72	-	-	-	65	<0.5	2107	<0.05	0.8	24	<0.1	2.1
Total	72	<1	5.4	17	521	0.5	2165	<0.05	1.6	550	<0.1	5.6
SRK-58 3L												
Dissolved	24	-	-	-	200	1.4	6921	<0.05	0.8	88	<0.1	0.5
Total	24	<1	13	120	2888	1.4	7330	<0.05	5.8	3143	<0.1	8.3
Dissolved	72	-	-	-	152	1.4	6659	<0.05	10.8	44	<0.1	6.4
Total	72	<1	4.5	29	852	1.4	6966	<0.05	2.2	802	<0.1	2.4
SRK-58 4L												
Dissolved	24	-	-	-	182	0.8	6460	<0.05	0.7	107	<0.1	2.4
Total	24	<1	11	75	2037	0.9	6858	<0.05	4.1	2207	<0.1	6.3
Dissolved	72	-	-	-	81	1.1	8070	<0.05	1	27	<0.1	<0.5
Total	72	1	4.1	16	495	1.2	8588	<0.05	2.1	464	<0.1	2.2

Note: * calculated from the difference between total and dissolved solids concentrations, corrected for oxide content.

Table 3.7 Estimated Composition of Suspended Solids

Description	SRK-51 3L		SRK-58 3L		SRK-58 4L	
	24 hr	72 hr	24hr	72 hr	24 hr	72 hr
Al ₂ O ₃	19.8	10.7	22.6	18.5	20.0	12.3
CaO	0.6	1.0	2.6	6.0	3.2	11.4
CuO	0.013	0.012	0.028	0.031	0.024	0.022
Fe ₂ O ₃	17.6	9.4	19.5	15.1	17.1	9.8
K ₂ O	8.8	4.9	5.7	7.1	5.3	13.4
MgO	23.1	9.1	11.7	9.9	15.9	27.7
Mn ₂ O ₃	0.2	0.1	0.3	0.2	0.2	0.1
Na ₂ O	-	49.4	9.4	19.1	11.0	7.0
SiO ₂	29.4	15.2	28.1	24.0	27.0	17.7
TOTAL (%)	99.4	99.8	99.9	100.0	99.7	99.6

Note: Compositions calculated from difference between total and dissolved concentrations

4 Potential Effects on Tail Lake Water Quality

Tail Lake, after operations, i.e. after tailings deposition ceases and when the lake elevation is lowered to the current outflow elevation, will contain about 2.2 million m³ of water. The average retention time in Tail Lake will range from about 4.4 years (low yield flow) to about 2.7 years (high yield flow). Compared to a settling time of 72 hours of the settling tests, it is apparent that ample time will be available from the time that the solids are released at the shoreline until the flow reaches Tail Lake outflow, to allow settling to occur to at least the levels observed in the 72 hour settling tests.

The results presented in Table 3.6 reflect the upper limit of the solids loadings to Tail Lake at a low runoff yield. It should also be noted that not all of the solids that may be released will contain the same fractions of clay minerals contained in the test samples.

Considering these conservatisms, metal and TSS concentrations that may develop in Tail Lake were estimated from the average concentrations observed in the three tests. The average concentrations were then corrected for the estimated solids loadings projected for the three different cases under consideration. The calculation was as follows:

$$C(i)_{case} = C(i)_{tests} * (SL_{case}/SL_{tests})$$

Where: $C(i)_{case}$ is the concentration of solute (i) for the case under consideration

$C(i)_{tests}$ is the average concentration for solute (i) measured in the three tests (Column 4 in Table 4.1)

SL_{case} is the total sediment loading for the case under consideration (see table 4.1)

SL_{tests} is the average sediment loading in the tests (see Table 4.1)

Where concentrations were below detection, a concentration of 50 % of the detection limit was adopted in the calculations. The resultant base case, lower limit and upper limit steady state total concentrations are shown in Table 4.1. These concentrations reflect the water quality that may develop in Tail Lake after the water level in Tail Lake is lowered to the current overflow elevation under conditions of sustained rates of erosion.

The results for the base case assessment indicate that, with the exception of aluminium, the water quality in Tail Lake is likely to meet CCME guidelines for freshwater aquatic life in the interim period when maximum solids loadings occur. In the longer term, the concentrations are expected to decrease as the shoreline stabilizes and annual solids long-term.

The lower limit estimates indicate that all parameters including aluminium are likely to meet CCME guidelines for the protection of freshwater aquatic life.

The upper limit estimates suggest that concentrations of aluminium, iron and selenium, and for low flow conditions possibly chromium, may exceed CCME guidelines in Tail Lake. However, as noted before, these concentrations could occur only if solid loadings reach the estimated maximum loading rates, and persist at those rates indefinitely. Effects such as natural revegetation and re-establishment of permafrost are not considered. Without any intervention, in time these natural occurrences are likely to reduce overall sediment loadings.

Table 4.1 Estimated Steady Erosion Generated Concentrations in Tail Lake without Erosion Control

Description	Units	CCME	Test Average	Low Yield (111 mm/year)			High Yield (180 mm/year)		
Flow	m ³ /year		-	500,000			812,000		
Case			-	Lower Limit	Base case	Upper Limit	Lower Limit	Base case	Upper Limit
Total Sediment Load	g/L		14.5	2.14	6.11	15.27	1.32	3.76	9.40
TSS (measured)	mg/L		1.0	0.1	0.4	1.1	0.1	0.3	0.6
TSS (calc.)	mg/L		7.2	1.1	3.0	7.6	0.7	1.9	4.7
Chloride	mg/L		195	29	82	205	18	50	126
Total Metals									
Aluminium Al	ug/L	100	623	92	262	656	57	162	404
Antimony Sb	ug/L		0.17	0.025	0.070	0.176	0.015	0.043	0.108
Arsenic As	ug/L	5	1.0	0.15	0.44	1.1	0.09	0.27	0.67
Bismuth Bi	ug/L		0.025	0.004	0.011	0.026	0.002	0.006	0.016
Boron B	ug/L		78	11	33	82	7	20	50
Cadmium Cd	ug/L	0.038	0.025	0.004	0.011	0.026	0.002	0.006	0.016
Calcium Ca	ug/L		5,906	8,73	2,488	6,223	538	1,532	3,832
Chromium Cr	ug/L	1	1.2	0.18	0.52	1.29	0.11	0.32	0.80
Cobalt Co	ug/L		0.31	0.046	0.13	0.33	0.028	0.080	0.20
Copper Cu	ug/L	2	1.97	0.29	0.83	2.0	0.18	0.51	1.3
Iron Fe	ug/L	300	605	89	255	638	55	157	393
Lead Pb	ug/L	2	0.12	0.017	0.049	0.12	0.011	0.030	0.076
Lithium Li	ug/L		5.7	0.85	2.4	6.0	0.52	1.5	3.7
Magnesium Mg	ug/L		8,264	1,222	3,481	8,707	752	2,144	5,361
Manganese Mn	ug/L		14	2.1	6.1	15	1.3	3.7	9.4
Mercury Hg	ug/L	0.1	0.050	0.007	0.021	0.053	0.005	0.013	0.032
Molybdenum Mo	ug/L	73	0.80	0.12	0.34	0.84	0.073	0.21	0.52
Nickel Ni	ug/L	25	0.63	0.094	0.27	0.67	0.058	0.16	0.41
Phosphorus P	ug/L		47	7	20	49	4	12	30
Potassium K	ug/L		6,485	959	2,732	6,833	590	1,682	4,208
Selenium Se	ug/L	1	2.5	0.37	1.0	2.6	0.23	0.66	1.6
Silicon Si	ug/L		1,518	224	640	1,600	138	394	985
Silver Ag	ug/L		0.025	0.004	0.011	0.026	0.002	0.006	0.016
Sodium Na	ug/L		115,565	17,083	48,685	121,764	10,519	29,979	74,978
Strontium Sr	ug/L		41	6	17	43	4	11	26
Thallium Tl	ug/L	0.8	0.005	0.001	0.002	0.005	0.0001	0.001	0.003
Tin Sn	ug/L		0.095	0.014	0.040	0.100	0.009	0.025	0.062
Titanium Ti	ug/L		35	5.2	15	37	3.2	9.2	22
Vanadium V	ug/L		5.20	0.77	2.2	5.5	0.47	1.4	3.4
Zinc Zn	ug/L	30	3.40	0.50	1.4	3.6	0.31	0.88	2.2

*TSS Calc – total suspended solids concentration calculated from total and dissolved parameter concentrations

5 References

SRK Consulting (Canada) Inc. 2005a. *Water Cover Design for Tail Lake*. Technical Memorandum submitted to Miramar Hope Bay Limited, September 16.

SRK Consulting (Canada) Inc. 2005d. *Potential Shoreline Erosion Processes at Tail Lake, Doris North Project, Hope Bay, Nunavut, Canada*. Technical Report No. 1CM014.006 submitted to Miramar Hope bay Limited, September.

SRK Consulting (Canada) Inc. 2005c. *Re-Suspension of Shoreline Eroded Material in Tail Lake*. Technical Memorandum submitted to Miramar Hope Bay Limited, September 16.

SRK Consulting (Canada) Inc. 2005d. *Summer 2004 Geotechnical Field Investigation at Tail Lake, Doris North Project, Nunavut, Canada*. Technical Report No. 1CM014.04-050 submitted to Miramar Hope bay Limited, April.

SRK Consulting (Canada) Inc. 2005f. *Winter 2005 Geotechnical Field Investigation at Tail Lake, Doris North Project, Nunavut, Canada*. Technical Report No. 1CM014.04-0110 submitted to Miramar Hope bay Limited, October.

Attachment 1
Soil Sample Characteristics

Hope Bay - Doris North Samples

Received September 2, 2005

QA/QC for Metals

ELEMENT	SAMPLES	SRK-51 3L	SRK-58 3L	SRK-58 4L		STANDARD DS6	STANDARD DS6 true value	% deviation from true value
Mo	ppm	1.5	1.1	1.3		11.4	11.72	2.73
Cu	ppm	36.8	31.5	36.5		121.9	122	0.08
Pb	ppm	9.9	10.9	9.3		30.6	28.95	-5.70
Zn	ppm	80	76	80		142	141	-0.71
Ag	ppm	0.1	0.1	0.1		0.3	0.271	-10.70
Ni	ppm	37.5	29.5	36.4		24.5	24.8	1.21
Co	ppm	16.1	13.2	15.2		10.6	10.8	1.85
Mn	ppm	438	399	442		703	704	0.14
Fe	%	3.24	2.76	3.17		2.81	2.80	-0.50
As	ppm	2	1.4	1.9		21.1	21.5	1.86
U	ppm	1.8	1.4	1.7		6.9	6.48	-6.48
Au	ppb	5.4	2.1	2.8		46	46.3	0.65
Th	ppm	15.1	13	14		3.1	3	-3.33
Sr	ppm	48	41	43		40	39.6	-1.01
Cd	ppm	0.1	0.1	0.1		6	5.98	-0.33
Sb	ppm	<.1	<.1	0.1		3.5	3.42	-2.34
Bi	ppm	0.2	0.2	0.2		5.2	5.02	-3.59
V	ppm	79	62	76		55	56	1.79
Ca	%	0.66	0.72	0.74		0.85	0.85	-0.24
P	%	0.066	0.061	0.064		0.078	0.079	1.27
La	ppm	46	40	42		14	14.2	1.41
Cr	ppm	85.8	62.6	78.6		185.5	190.9	2.83
Mg	%	1.74	1.44	1.7		0.57	0.57	0.00
Ba	ppm	152	122	132		164	167	1.91
Ti	%	0.193	0.166	0.182		0.081	0.081	0.00
B	ppm	24	20	27		18	16.1	-11.80
Al	%	2.19	1.84	2.12		1.89	1.89	0.00
Na	%	0.828	0.731	0.862		0.071	0.071	0.00
K	%	0.72	0.57	0.67		0.14	0.15	6.04
W	ppm	0.2	0.2	0.2		3.4	3.33	-2.10
Hg	ppm	<.01	<.01	0.01		0.23	0.231	0.43
Sc	ppm	7.1	5.6	6.6		3.3	3.3	0.00
Tl	ppm	0.3	0.2	0.2		1.7	1.69	-0.59
Ga	ppm	10	8	9		6	6.2	3.23
Se	ppm	<.5	<.5	<.5		4.2	4.3	2.33



ABA Results for Hope Bay- Doris North Samples Received September 2, 2005

Sample	Paste pH	Total Sulphur (Wt.%)	Sulphate Sulphur (Wt.%)	Sulphide Sulphur* (Wt.%)	Maximum Potential Acidity** (Kg CaCO3/Tonne)	Neutralization Potential (Kg CaCO3/Tonne)	Net Neutralization Potential (Kg CaCO3/Tonne)	Fizz
SRK-51 3L	7.5	0.06	0.05	0.01	0.3	13.2	12.9	none
SRK-58 3L	7.7	0.08	0.04	0.04	1.1	10.2	9.1	none
SRK-58 4L	7.6	0.12	0.10	0.02	0.8	11.2	10.4	none
<i>Detection Limits</i>	<i>0.1</i>	<i>0.02</i>	<i>0.01</i>					
Vizon Method Number	7160	7400	7410	Calculation	Calculation	7150	Calculation	7150

*Based on difference between total sulphur and sulphate-sulphur

**Based on sulphide-sulphur

NP method used: Mod. ABA method (1989)

**X-Ray Diffraction Analysis
(Combined Whole Rock and Clay)**



Company: Vizon SciTec Inc.
Location: SRK-Hope Bay 2-21-900
File No: 52135-05-3361

Sample No Sample ID	1 SRK-51L 3L-S2E	2 SRK-58 3L-S3E	3 SRK-58 4L		
	Whole Rock Weight %				
Quartz	41	46	46		
K-Feldspar	9	8	8		
Plagioclase	30	28	29		
Amphibole	1	1	1		
Calcite	0	0	0		
Ankerite	0	0	0		
Dolomite	0	0	0		
Gypsum	0	0	0		
Halite	0	0	0		
Siderite	0	0	0		
Pyrite	3	3	3		
Hematite	0	0	0		
Total Clay	16	14	13		
Total	100	100	100		
	Relative Clay %				
Smectite	4	2	4		
Illite / Smectite *	0	0	0		
Illite & Mica	66	62	60		
Kaolinite	7	9	7		
Chlorite	23	27	29		
Total	100	100	100		

* Illite / Smectite Mixed-Layer Clay

Attachment 2
Settling Test Results

Hope Bay - Doris North Settling Tests

Sample id	% Moisture	weight used g	total volume mL	1hr settling mL	2hr settling mL	4hr settling mL	8hr settling mL	24hr settling mL	48hr settling mL	72hr settling mL
SRK-51 3L S2E (2.12 t 2.6)	24.8	40	2000	40-50	40-50	40	30-40	30-40	30-40	30-40
SRK-51 3L S3E(2.12 t 2.6)		40	2000	40-50	40-50	40	30-40	30-40	30-40	30-40
Clarity above interface				heavy in suspended solids	heavy in suspended solids	some clarity	some clarity	some clarity	very clear	very clear
SRK-58 3L (4.1 to 4.4)	23.7	40	2000	no interface	80-90	90-100	80-90	70-80	70-80	70-80
SRK-58 3L (4.1 to 4.4)		40	2000	no interface	80-90	110-120	90-100	80-90	80-90	80-90
Clarity above interface				heavy in suspended solids	heavy in suspended solids	heavy in suspended solids	heavy in suspended solids	some clarity	very clear	very clear
SRK-58 4L	34.1	40	2000	200	180	150-160	140-150	110-120	90-100	90-100
SRK-58 4L		40	2000	120	120	110-120	90-100	80-90	70-80	70-80
Clarity above interface				heavy in suspended solids	heavy in suspended solids	heavy in suspended solids	some clarity	some clarity	very clear	very clear

ELEMENT SAMPLES	TSS (1um) mg/L	Turbidity NTU
SRK-51 3L T Sep 7 05 @ 24hr	<1	17
SRK-51 3L T Sep 9 05 @ 72hr	<1	17
SRK-58 3L T Sep 7 05 @ 24hr	<1	120
SRK-58 3L T Sep 9 05 @ 72hr	<1	29
SRK-58 4L T Sep 7 05 @ 24hr	<1	75
SRK-58 4L T Sep 9 05 @ 72hr	1	16



Photo 1. Settling Tests at Time = 0 hr

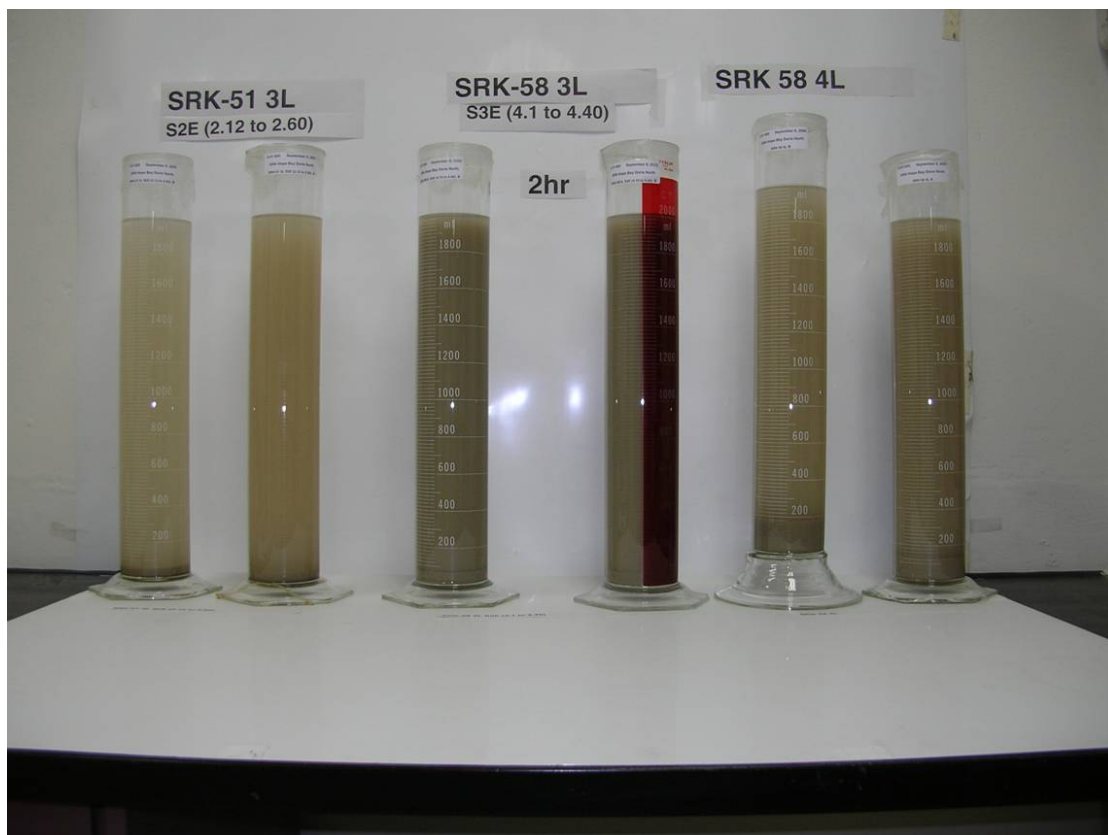


Photo 2 Settling Tests at Time = 2hr

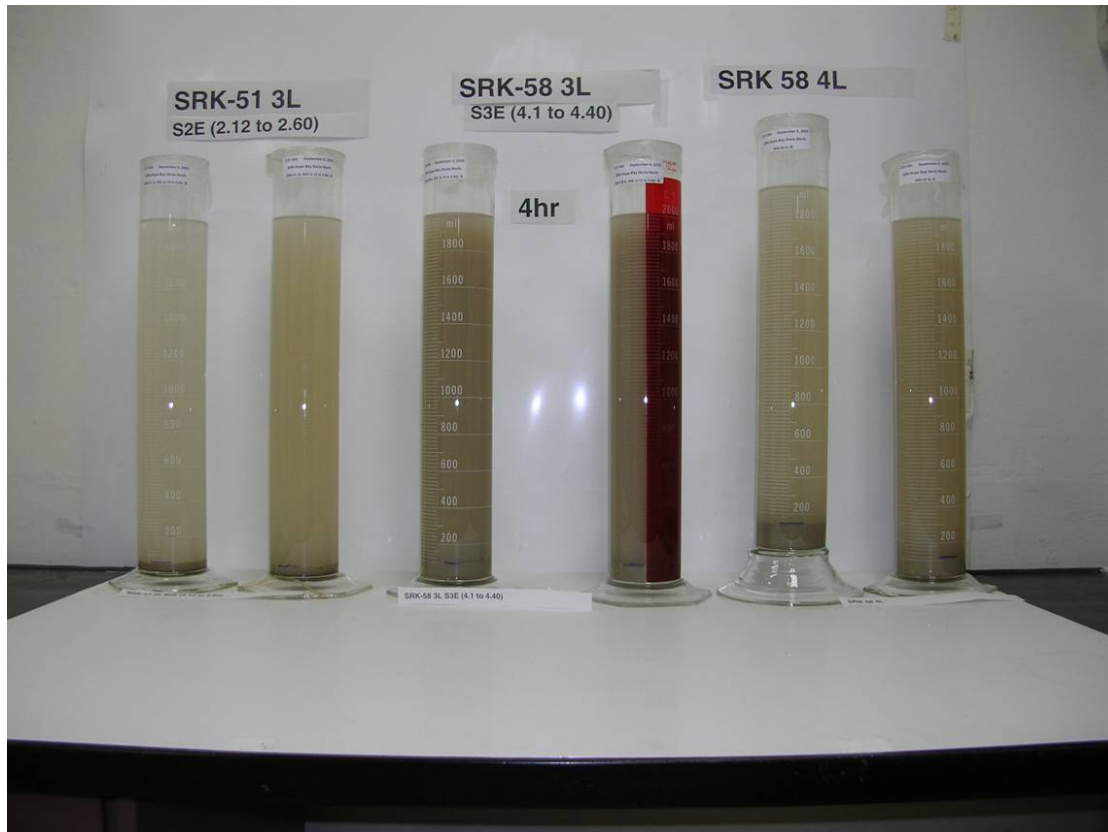


Photo 3 Settling Tests at Time = 4hr

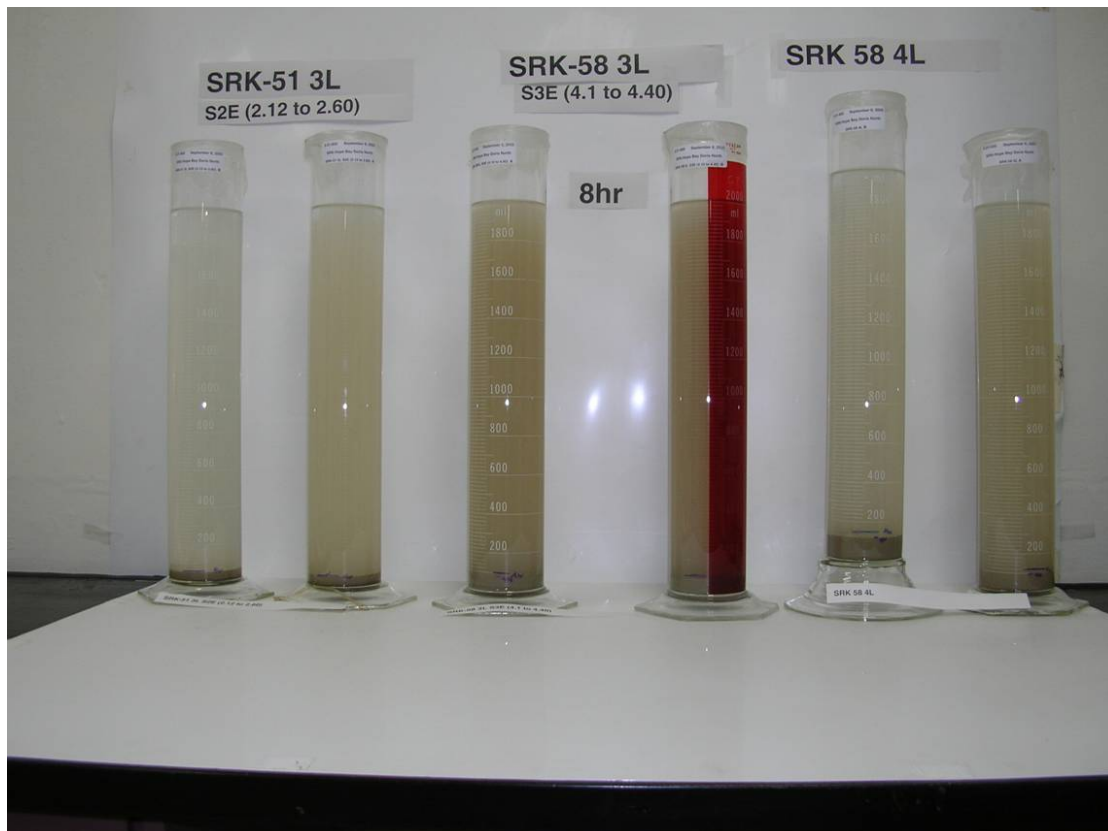


Photo 4 Settling Tests at Time = 8hr

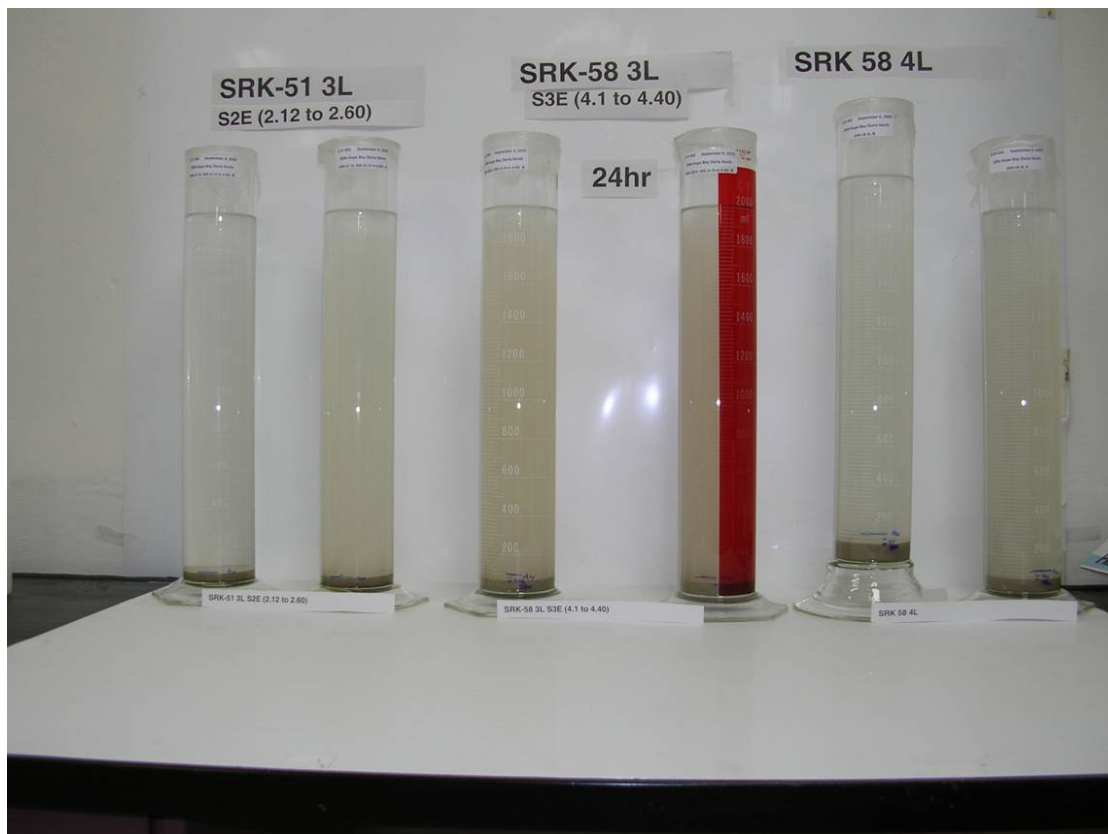


Photo 5 Settling Tests at Time = 24hr

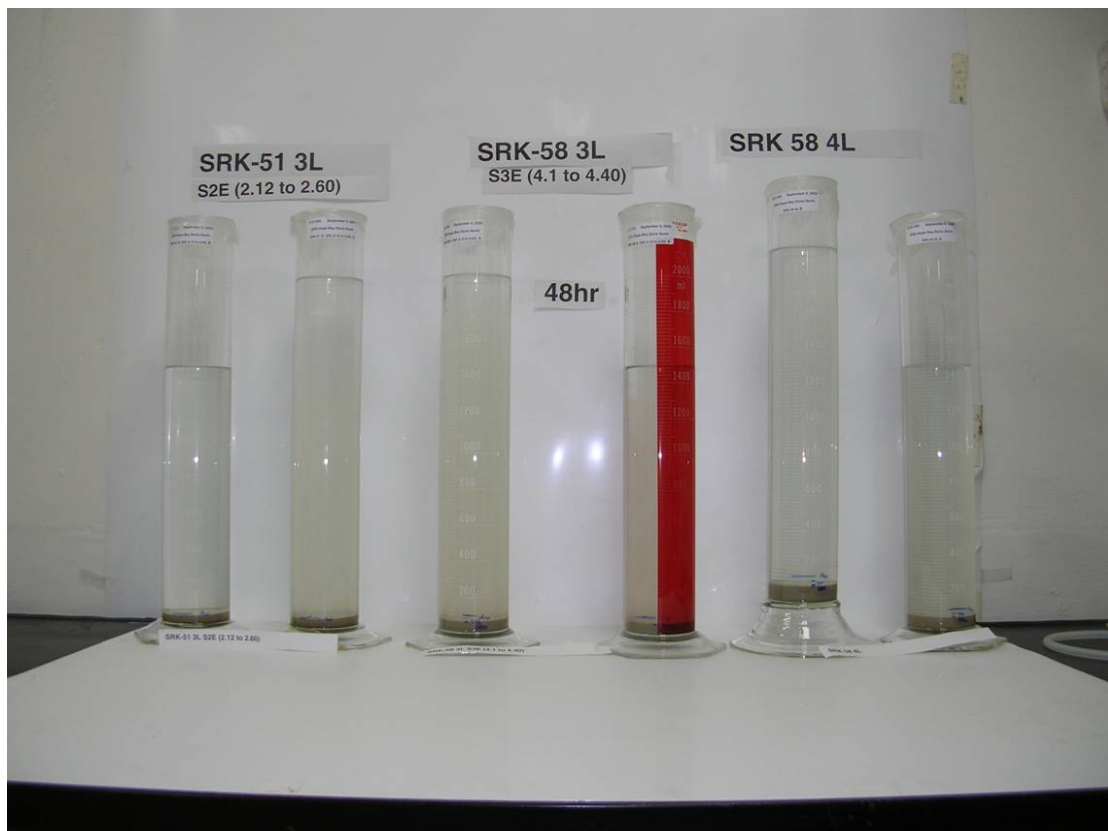


Photo 6 Settling Tests at Time = 48hr



Photo 7 Settling Tests at Time = 72hr

Attachment 3
Supernatant Analytical Results

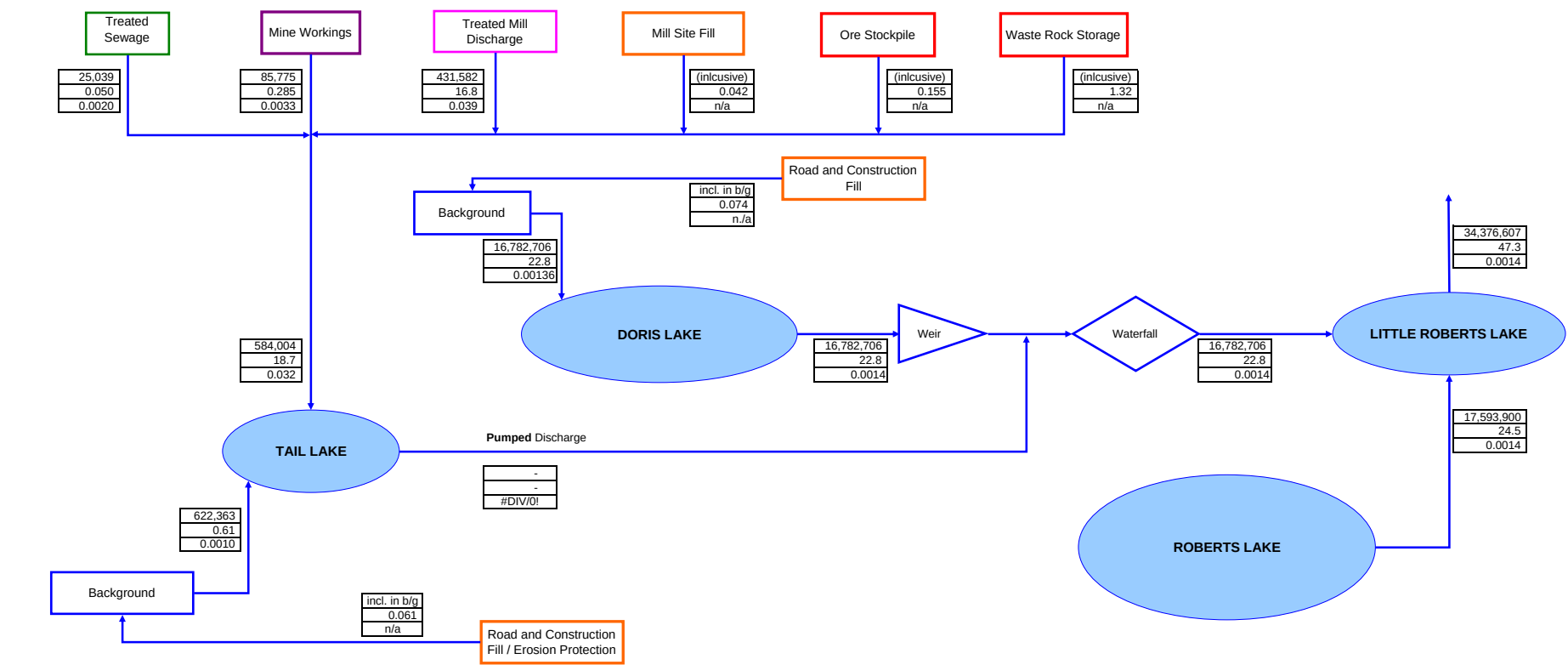
Metals and Total Suspended Results for Hope Bay- Doris North Settling Study Samples Received September 2, 2005

ELEMENT	Units	SRK-51 3L D Sep 7 05 @ 24hr	SRK-51 3L T Sep 7 05 @ 24hr	SRK-58 3L D Sep 7 05 @ 24hr	SRK-58 3L T Sep 7 05 @ 24hr	SRK-58 4L D Sep 7 05 @ 24hr	SRK-58 4L T Sep 7 05 @ 24hr	SRK-51 3L D Sep 9 05 @ 72hr	SRK-51 3L T Sep 9 05 @ 72hr	SRK-58 3L D Sep 9 05 @ 72hr	SRK-58 3L T Sep 9 05 @ 72hr	SRK-58 4L D Sep 9 05 @ 72hr	SRK-58 4L T Sep 9 05 @ 72hr
TSS	mg/L	n/a	<1	n/a	<1	n/a	<1	n/a	<1	n/a	<1	n/a	1
Ag	ppb	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
Al	ppb	49	562	200	2888	182	2037	65	521	152	852	81	495
As	ppb	<.5	0.6	1.4	1.4	0.8	0.9	<.5	0.5	1.4	1.4	1.1	1.2
Au	ppb	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
B	ppb	49	58	60	64	61	76	61	66	68	69	90	98
Ba	ppb	1.73	4.97	2.08	20.1	2.11	14.1	1.29	4.97	2.72	6.95	1.84	4.26
Be	ppb	0.13	<.05	<.05	0.17	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
Bi	ppb	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
Br	ppb	402	414	378	383	451	452	422	430	371	375	574	612
Ca	ppb	2193	2213	6921	7330	6460	6858	2107	2165	6659	6966	8070	8588
Cd	ppb	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
Ce	ppb	0.10	1.70	0.54	9.63	0.37	5.64	0.09	1.60	0.25	2.52	0.09	1.19
Cl	ppm	166	174	145	150	167	171	176	178	148	153	234	253
Co	ppb	0.02	0.30	0.04	1.63	0.06	1.08	0.04	0.31	0.02	0.38	0.03	0.24
Cr	ppb	<.5	1.3	<.5	5.3	0.5	3.8	<.5	1.2	<.5	1.5	<.5	1
Cs	ppb	0.01	0.04	0.02	0.18	0.02	0.12	0.01	0.03	0.01	0.05	0.01	0.03
Cu	ppb	0.5	1.0	0.8	5.8	0.7	4.1	0.8	1.6	10.8	2.2	1.0	2.1
Dy	ppb	<.01	0.04	0.01	0.21	<.01	0.13	<.01	0.03	<.01	0.06	<.01	0.03
Er	ppb	<.01	0.02	0.01	0.09	<.01	0.05	<.01	0.01	<.01	0.02	<.01	0.01
Eu	ppb	<.01	0.01	0.01	0.08	<.01	0.05	<.01	0.01	<.01	0.02	<.01	0.01
Fe	ppb	18	622	88	3143	107	2207	24	550	44	802	27	464
Ga	ppb	0.06	0.23	0.31	1.19	0.26	0.87	0.06	0.2	0.26	0.52	0.26	0.41
Gd	ppb	<.01	0.05	0.03	0.33	0.02	0.21	<.01	0.06	0.01	0.09	<.01	0.04
Ge	ppb	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
Hf	ppb	<.02	<.02	<.02	<.02	<.02	<.02	<.02	<.02	<.02	<.02	<.02	<.02
Hg	ppb	0.1	<.1	0.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
Ho	ppb	<.01	0.01	<.01	0.03	<.01	0.02	<.01	<.01	<.01	0.01	<.01	<.01
In	ppb	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
Ir	ppb	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
K	ppb	5300	5658	4985	6051	5673	6452	5640	5966	4995	5416	7365	8074
La	ppb	0.05	0.89	0.27	4.77	0.18	2.89	0.04	0.79	0.17	1.28	0.04	0.59
Li	ppb	5.0	7.0	3.1	7.3	3.9	7.5	6.5	7.2	3.7	4.3	5.3	5.7
Lu	ppb	<.01	<.01	<.01	0.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
Mg	ppb	5458	6141	6379	7965	8158	9844	5404	5845	6405	6833	11053	12113
Mn	ppb	8.82	15.82	6.62	53.33	7.88	35.63	6.4	12.52	4.58	16.06	9.94	14.76
Mo	ppb	0.5	0.5	0.6	0.3	1.0	0.8	0.5	0.4	0.6	0.5	1.5	1.5
Na	ppb	108483	107304	90732	92305	106726	108163	109934	112879	90758	91772	141713	142045
Nb	ppb	<.01	0.03	0.02	0.02	0.01	0.03	<.01	0.03	<.01	0.02	<.01	0.01
Nd	ppb	0.04	0.74	0.22	3.95	0.15	2.3	0.04	0.63	0.10	1.07	0.03	0.49
Ni	ppb	<.2	0.6	<.2	3.3	<.2	2.0	0.2	0.8	<.2	0.6	<.2	0.5
Os	ppb	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
P	ppb	<20	51	38	137	22	82	<20	31	44	71	25	38
Pb	ppb	<.1	5.3	<.1	1.2	<.1	0.7	<.1	<.1	2.5	0.2	<.1	0.1
Pd	ppb	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
Pr	ppb	0.01	0.2	0.06	1.05	0.04	0.62	0.01	0.17	0.03	0.28	0.01	0.12
Pt	ppb	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
Rb	ppb	0.96	2.40	1.80	9.27	2.04	7.00	1.01	2.32	1.85	3.54	2.32	3.47
Re	ppb	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
Rh	ppb	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
Ru	ppb	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
Sb	ppb	<.05	<.05	<.05	<.05	<.05	<.05	0.14	0.25	0.06	0.16	0.08	0.09
Sc	ppb	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
Se	ppb	2.3	2.3	2.1	2.2	2.4	2.4	2.3	2.2	2.2	2.0	3.2	3.4
Si	ppb	443	1119	1078	4040	874	3097	590	1164	1088	1895	967	1496
Sm	ppb	<.02	0.1	0.03	0.58	0.02	0.33	<.02	0.09	<.02	0.15	<.02	0.07
Sn	ppb	<.05	<.05	<.05	<.05	<.05	<.05	<.05	0.14	0.2	0.12	<.05	<.05
Sr	ppb	31.97	32.49	36.35	42.87	37.02	40.81	29.94	30.99	35.2	38.42	47.85	52.91
Ta	ppb	<.02	<.02	<.02	<.02	<.02	<.02	<.02	<.02	<.02	<.02	<.02	<.02
Tb	ppb	<.01	0.01	<.01	0.04	<.01	0.02	<.01	<.01	<.01	0.01	<.01	<.01
Te	ppb	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05	<.05
Th	ppb	<.05	0.18	<.05	0.91	<.05	0.62	<.05	0.24	<.05	0.22	<.05	0.08
Ti	ppb	<10	39	<10	168	<10	122	<10	33	<10	46	<10	27
Tl	ppb	<.01	<.01	<.01	0.04	<.01	0.02	<.01	<.01	<.01	<.01	<.01	<.01
Tm	ppb	<.01	<.01	<.01	0.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
U	ppb	0.03	0.08	0.14	0.34	0.06	0.19	0.03	0.08	0.12	0.16	0.08	0.11
V	ppb	0.9	2.4	6.2	12.1	3.6	7.4	1.4	2.4	6.3	7.7	4.2	5.5
W	ppb	0.08	0.06	0.05	<.02	0.04	0.02	0.24	0.17	0.06	0.04	0.09	0.08
Y	ppb	0.01	0.19	0.05	0.95	0.04	0.55	0.01	0.14	0.02	0.24	0.01	0.12
Yb	ppb	<.01	0.01	<.01	0.08	<.01	0.05	<.01	0.01	<.01	0.02	<.01	0.01
Zn	ppb	<.5	1.2	0.5	8.3	2.4	6.3	2.1	5.6	6.4	2.4	<.5	2.2
Zr	ppb	0.02	0.20	0.07	0.19	0.07	0.23	0.04	0.23	0.03	0.17	0.02	0.15

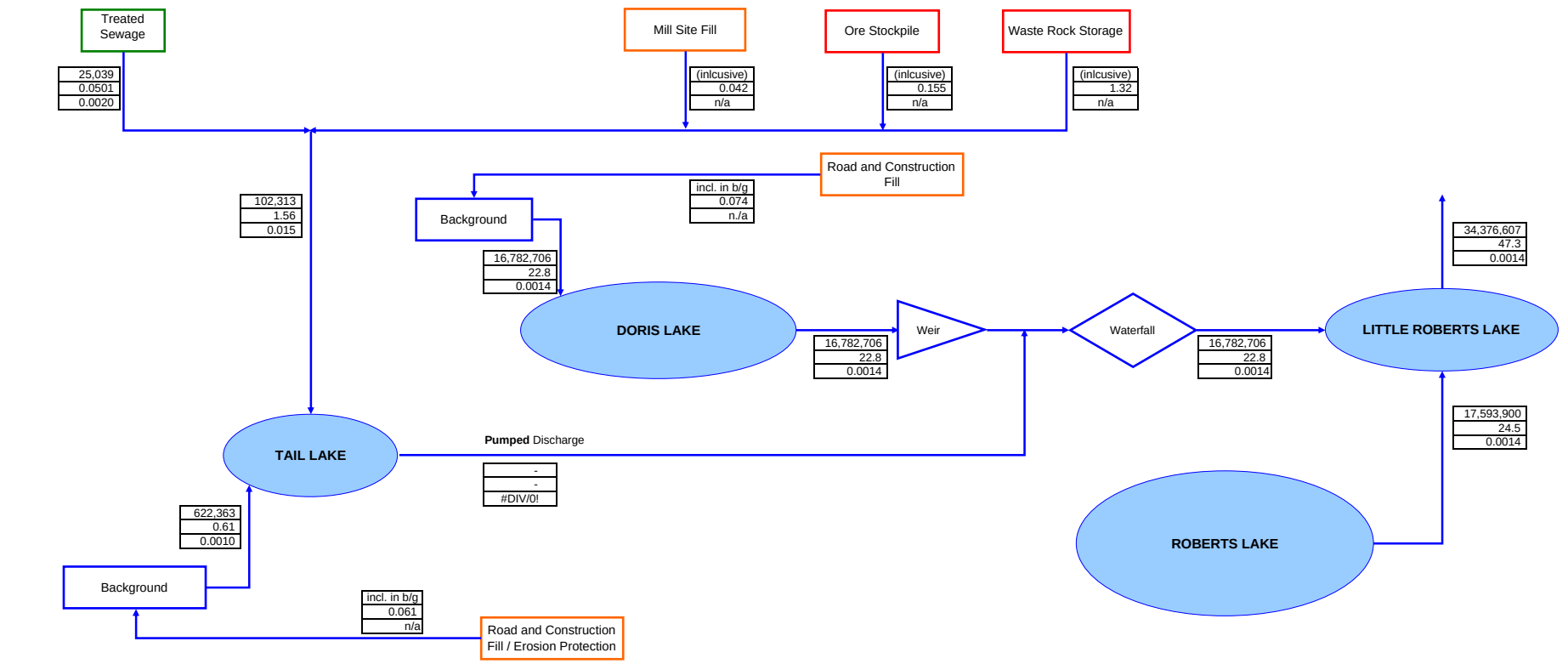
Appendix H

Water Quality Modelling Results – Average Flow Conditions

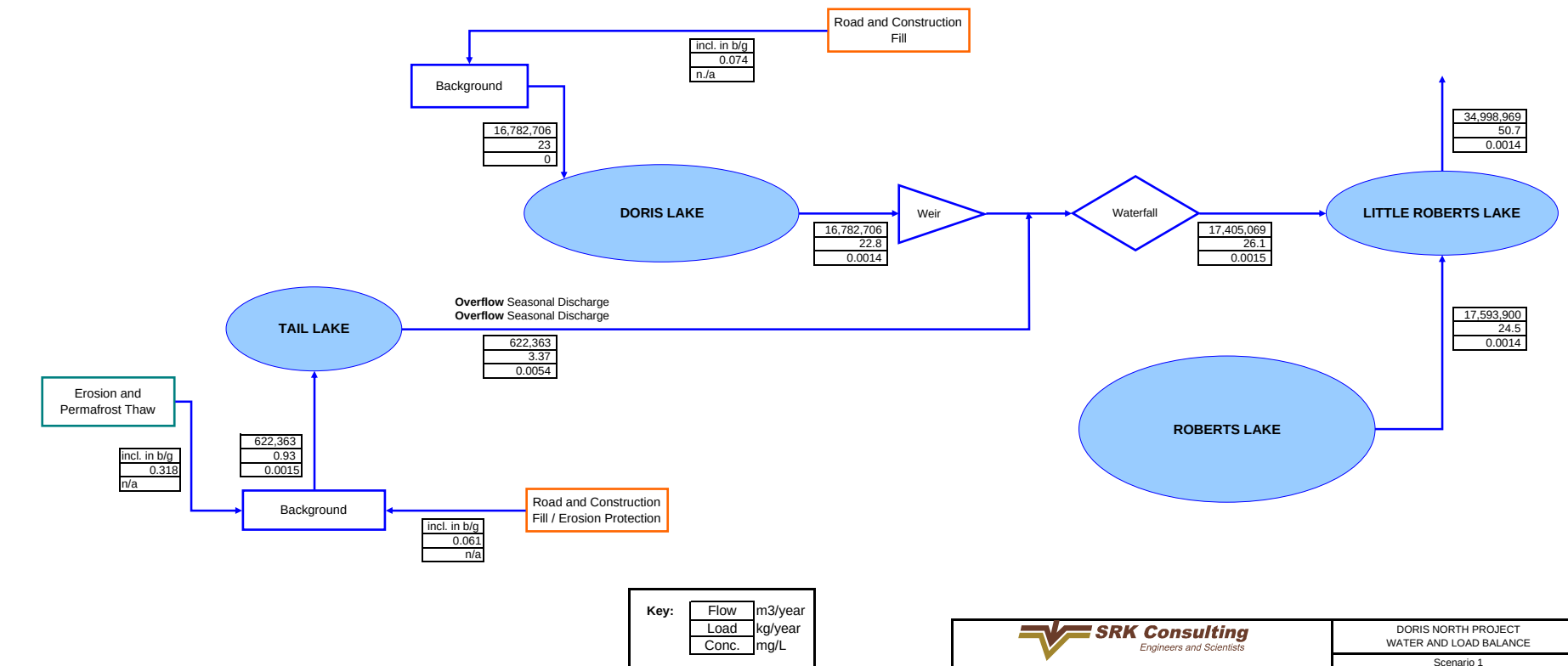
Scenario 1 - OPERATIONAL CONDITIONS
Year 2



POST MILLING OPERATIONAL CONDITIONS
Year 3



POST CLOSURE CONDITIONS
Year 8

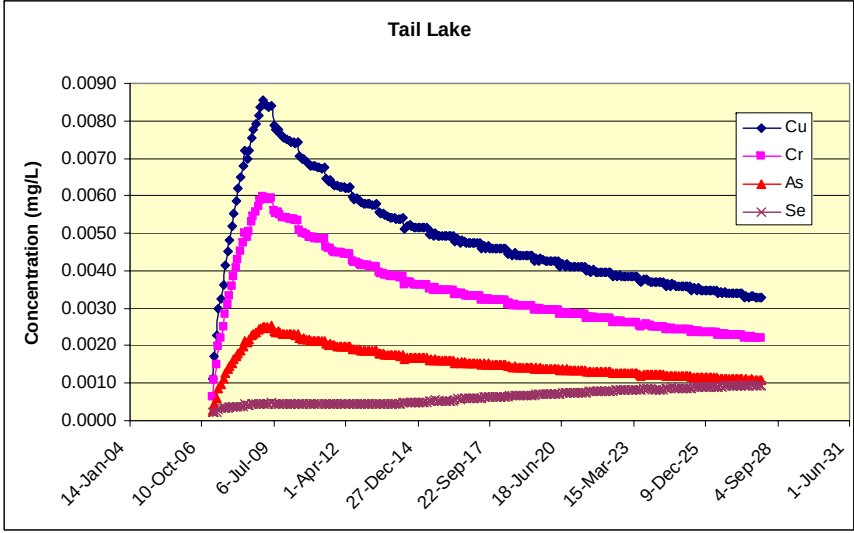
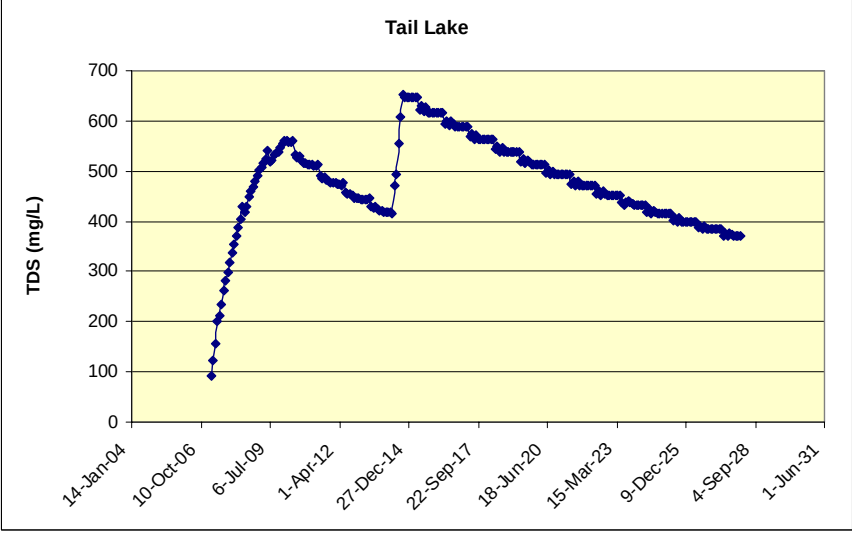
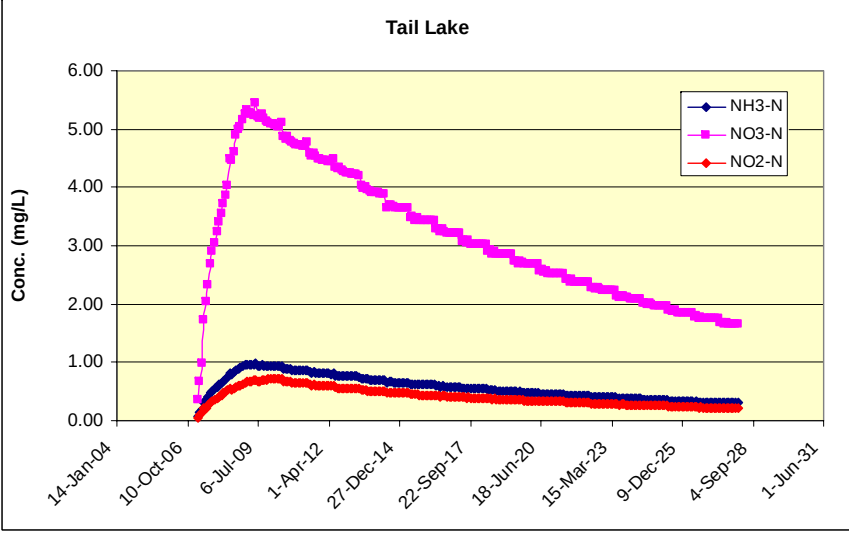
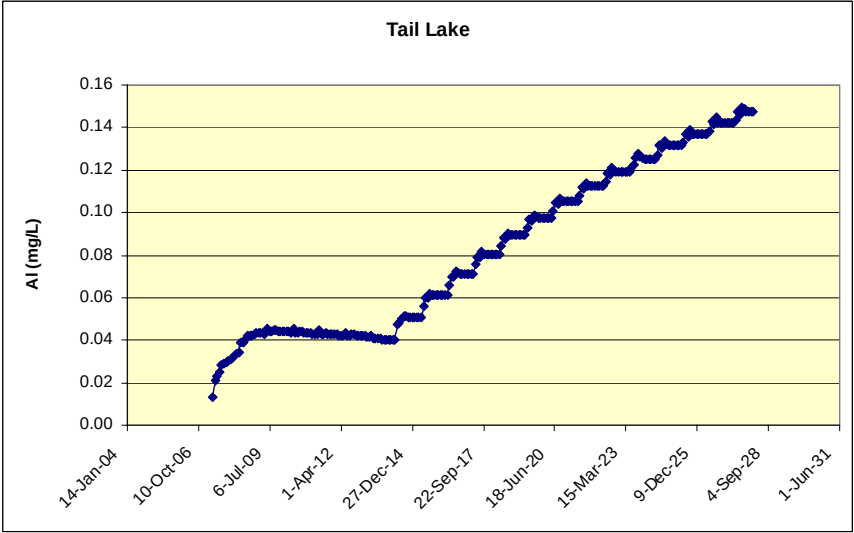
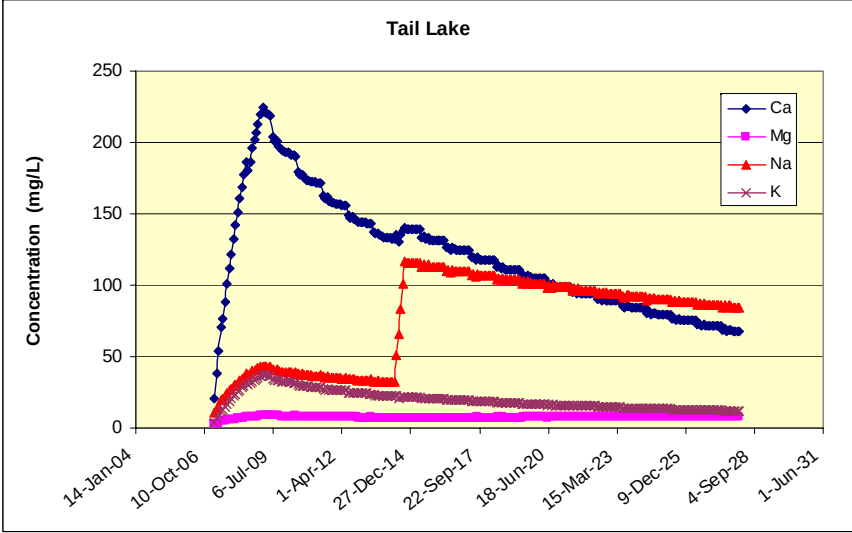
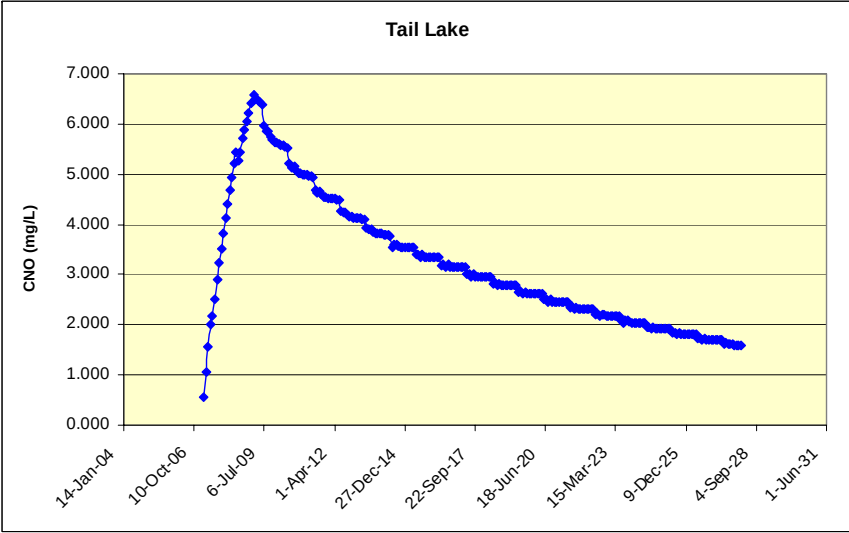
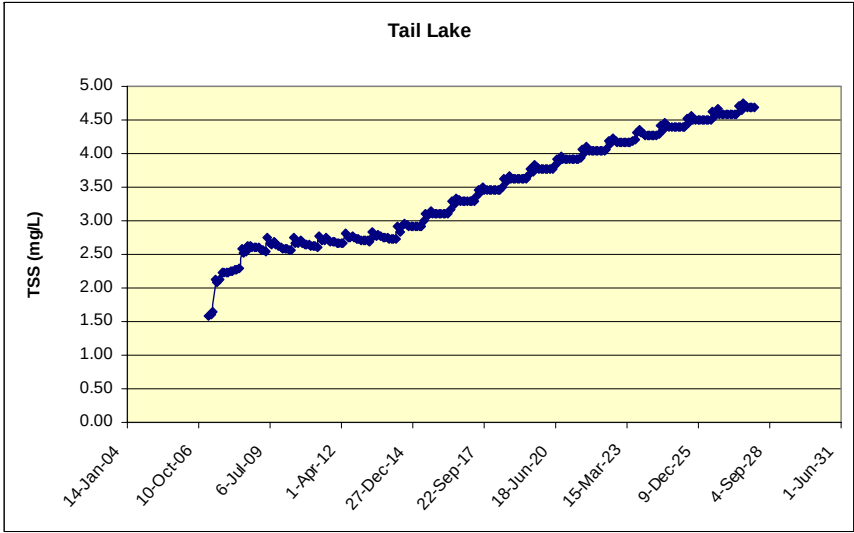
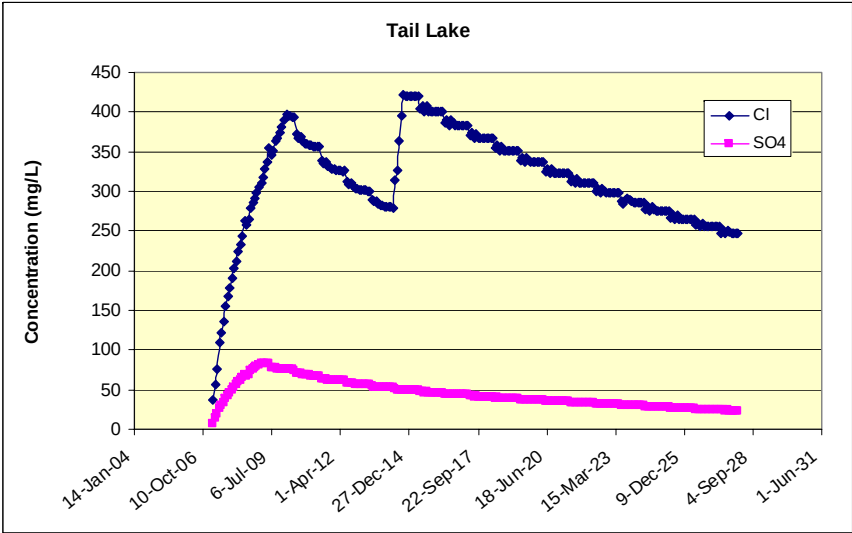
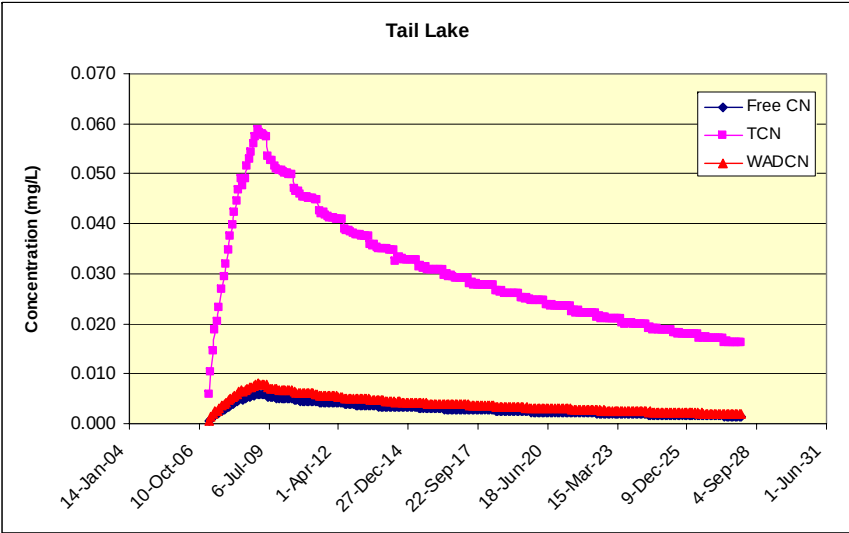


Key:

Flow	m3/year
Load	kg/year
Conc.	mg/L

MIRAMAR HOPE BAY LIMITED	 DORIS NORTH PROJECT WATER AND LOAD BALANCE			
	Scenario 1 No Erosion Control			
	PROJECT: 1CM014.06	Date: Oct-05	Approved: JTC	FIGURE H-1

Scenario 1



Scenario 1

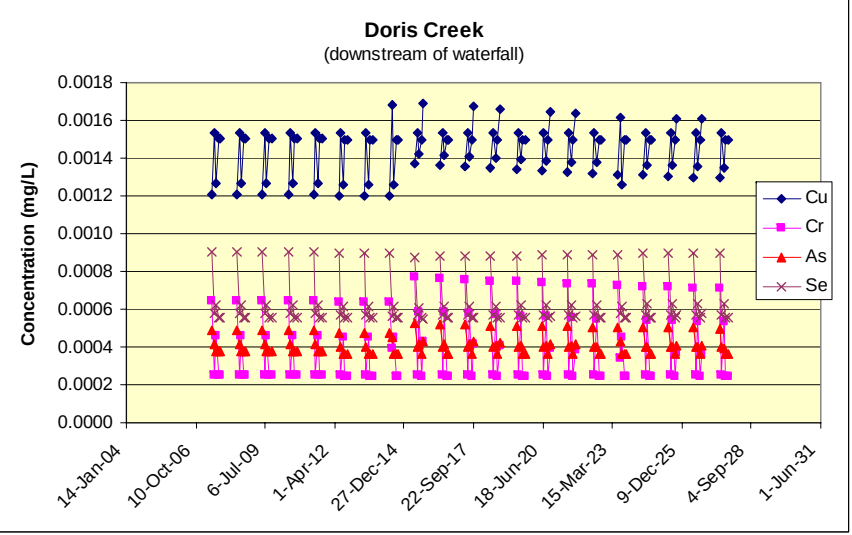
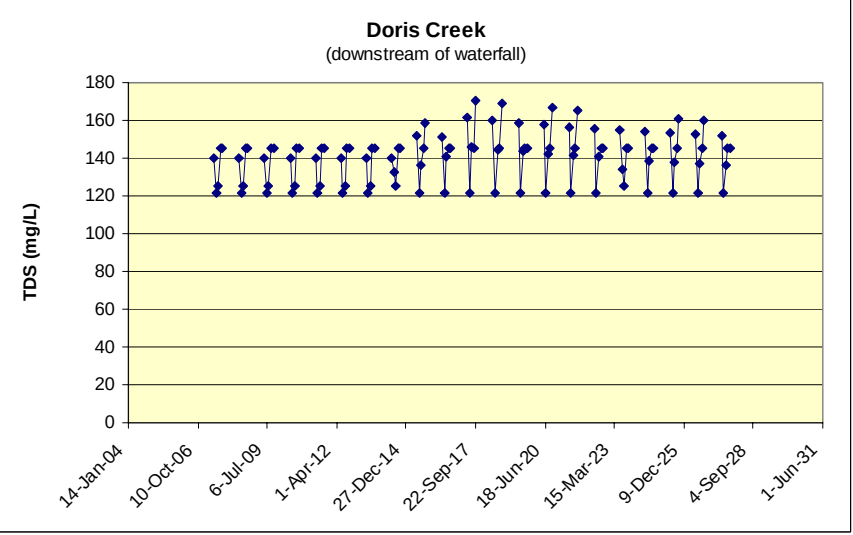
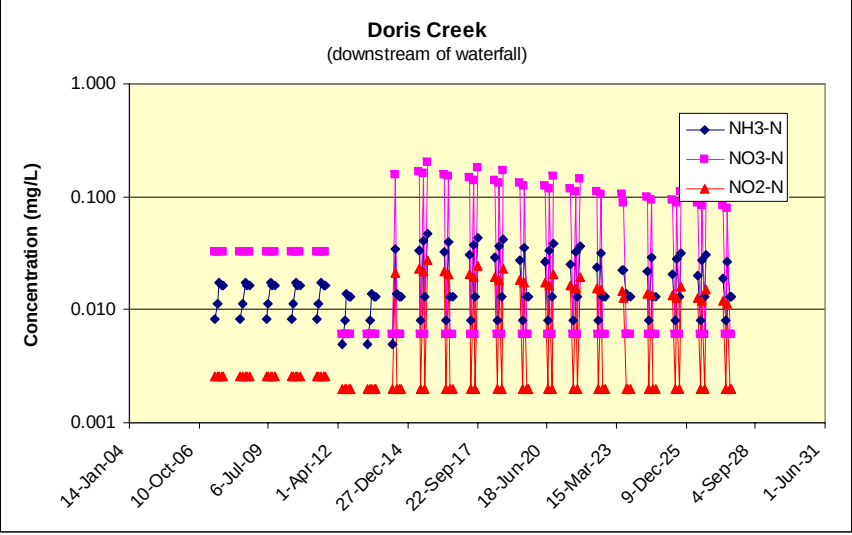
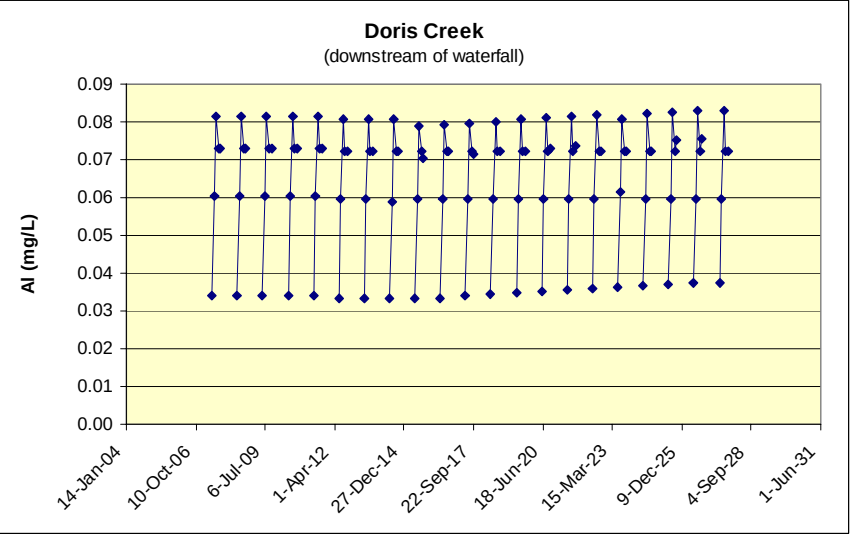
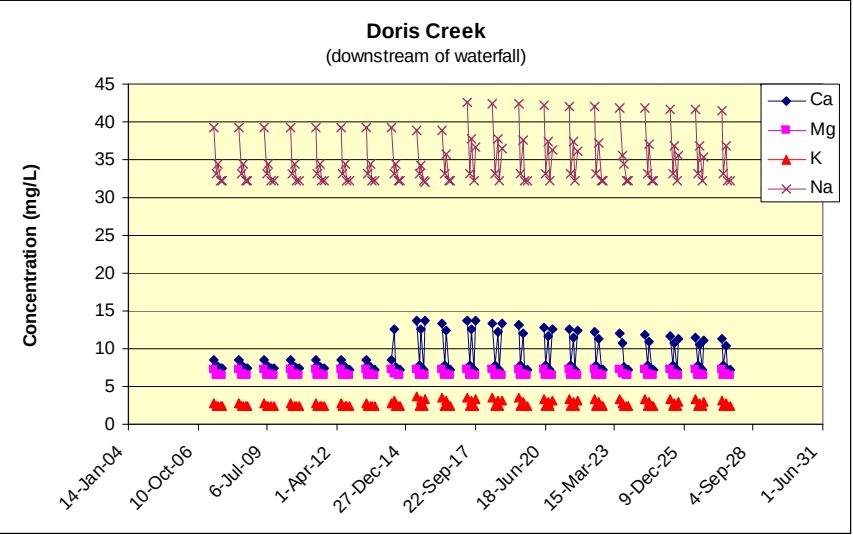
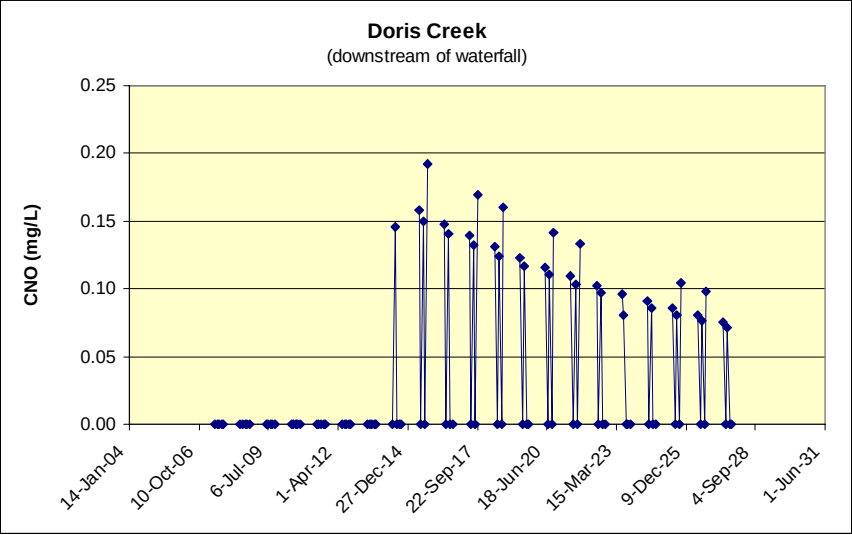
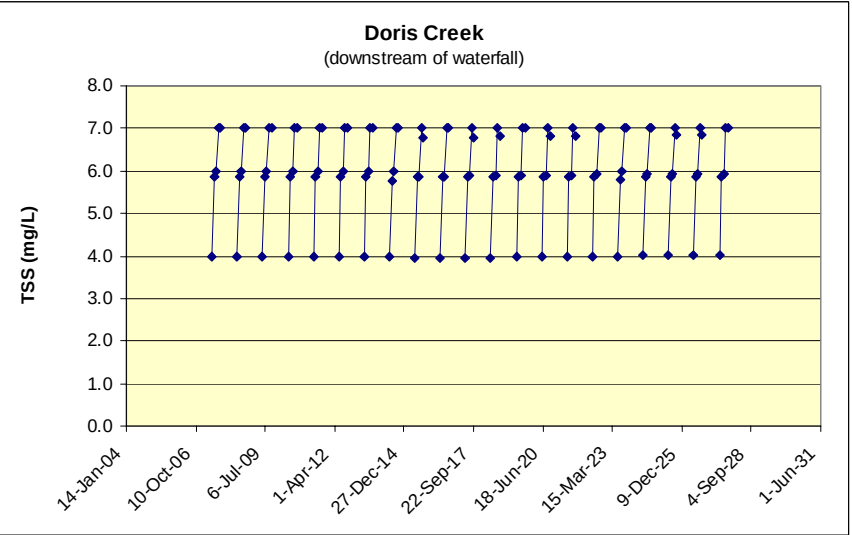
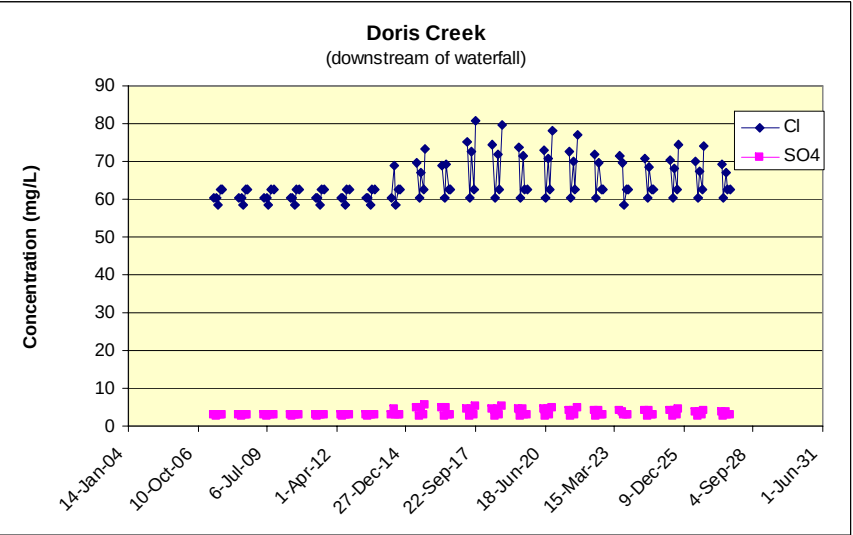
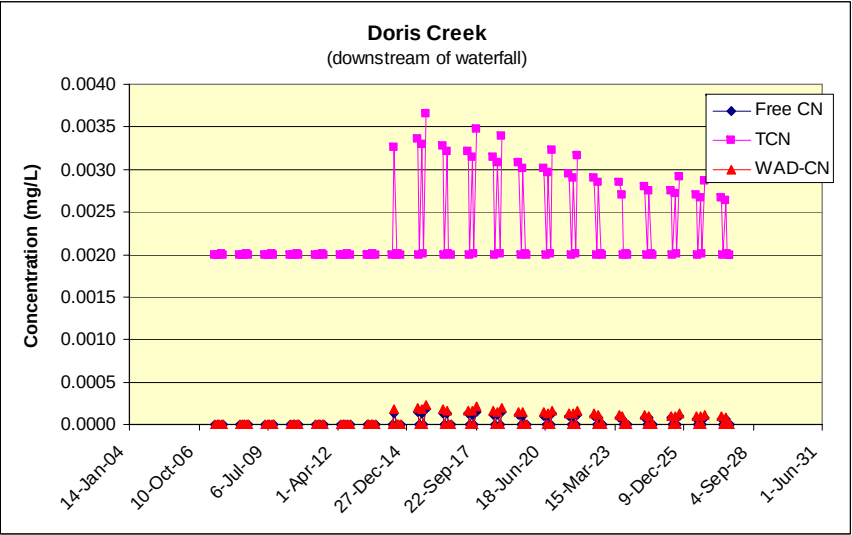


Table H-1-A-1
Scenario 1

OUTPUT SUMMARY							Fraction of CCME in Doris Creek (%)
Discharge rate		m ³ /year					
Degradation None		Tail Lk Cu < CME Year		35			
		MMER	CCME	Tail Lake Year 2	Doris Creek Year 9	L'Roberts L Year 9	
Maximum Concentration							
pH			6 to 9	7 to 8	7 to 8	7 to 8	
TDS	mg/L			652	172	178	
TSS	mg/L			4.8	7.0	8.1	
Free CN	mg/L		0.005	0.0060	0.00017	0.00009	3%
Total CN	mg/L	1.0		0.059	0.004	0.003	
WAD CN	mg/L			0.0080	0.0002	0.0001	
CNO	mg/L			6.6	0.19	0.10	
SCN	mg/L			0.090	0.003	0.001	
Sulphate	mg/L			83	5.5	5.8	
Chloride	mg/L			422	82	77	
Total Ammonia	mg/L		0.97	0.99	0.048	0.025	5%
Nitrate	mg/L		2.9	5.4	0.20	0.11	7%
Nitrite	mg/L		0.018	0.73	0.027	0.015	150%
Alkalinity	mg/L			52	28	26	
OrthoPhosphate-P	mg/L			0.1504	0.0059	0.0037	
Phosphate-P	mg/L			0.1537	0.0273	0.0263	
Org. Carbon	mg/L			6.4	7.5	7.1	
Hardness CaCO3	mg/L			100	47	46	
Total Metals							
Aluminum Al	mg/L		0.1	0.15	0.08	0.25	84%
Antimony Sb	mg/L			0.0138	0.0031	0.0019	
Arsenic As	mg/L	0.5	0.005	0.00	0.0005	0.0005	10%
Barium Ba	mg/L			0.0097	0.0033	0.0052	
Beryllium Be	mg/L			0.00056	0.00003	0.00002	
Bismuth Bi	mg/L			0.01323	0.00048	0.00034	
Boron B	mg/L			0.035	0.035	0.030	
Cadmium Cd	mg/L		0.000038	0.000051	0.0000039	0.0000153	10%
Calcium Ca	mg/L			225	14	11	
Chromium Cr	mg/L		0.001	0.0060	0.0008	0.001	77%
Cobalt Co	mg/L			0.0094	0.0011	0.0005	
Copper Cu	mg/L	0.3	0.002	0.009	0.00170	0.0020	85%
Iron Fe	mg/L		0.3	0.17	0.13	0.28	42%
Lead Pb	mg/L	0.2	0.002	0.00038	0.00007	0.00026	3%
Lithium Li	mg/L			0.0054	0.0029	0.0029	
Magnesium Mg	mg/L			8.8	7.3	7.3	
Manganese Mn	mg/L			0.026	0.021	0.024	
Mercury Hg	mg/L		0.0001	0.0000116	0.00000120	0.0000009	1%
Molybdenum Mo	mg/L		0.073	0.0081	0.00039	0.00033	1%
Nickel Ni	mg/L	0.5	0.025	0.008	0.0007	0.0007	3%
Phosphorus P	mg/L			0.227	0.029	0.027	
Potassium K	mg/L			37	3.6	3.2	
Selenium Se	mg/L		0.001	0.00096	0.0009	0.00084	90%
Silicon SiO2	mg/L			3.6	0.61	0.57	
Silver Ag	mg/L		0.0001	0.00011	0.0000068	0.0000056	7%
Sodium Na	mg/L			117	43	40	
Strontium Sr	mg/L			0.081	0.043	0.047	
Tellurium Te	mg/L			0.052	0.050	0.052	
Thallium Tl	mg/L		0.0008	0.000041	0.000031	0.0020	4%
Thorium Th	mg/L			0.000044	0.0000025	0.0000013	
Tin Sn	mg/L			0.00209	0.00046	0.00004	
Titanium Ti	mg/L			0.0133	0.0064	0.0064	
Uranium U	mg/L			0.000077	0.000039	0.000044	
Vanadium V	mg/L			0.0031	0.0006	0.0005	
Zinc Zn	mg/L	0.5	0.03	0.021	0.0036	0.0055	12%
Zirconium Zr	mg/L			0.0055	0.0050	0.0052	

Table H-1-A-2
Scenario 1

Water Quality in TAIL LAKE

Date		Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter													
TDS	mg/L	92	124	156	201	212	233	261	281	298	318	337	353
TSS	mg/L	1.6	1.6	1.6	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3
Free CN	mg/L	0.00050	0.00096	0.00141	0.00182	0.00198	0.00229	0.00265	0.00293	0.00319	0.00348	0.00376	0.00399
Total CN	mg/L	0.006	0.010	0.015	0.019	0.020	0.023	0.027	0.030	0.032	0.035	0.037	0.040
WAD CN	mg/L	0.0007	0.0013	0.0019	0.0024	0.0026	0.0031	0.0035	0.0039	0.0043	0.0046	0.0050	0.0053
CNO	mg/L	0.55	1.06	1.55	2.00	2.18	2.52	2.91	3.23	3.51	3.83	4.13	4.39
SCN	mg/L	0.008	0.014	0.021	0.027	0.030	0.034	0.040	0.044	0.048	0.052	0.056	0.060
Sulphate	mg/L	7.5	13.4	19.3	26.4	29.2	33.5	38.6	42.4	45.6	49.2	52.7	55.7
Chloride	mg/L	37	57	77	109	121	136	155	168	179	191	202	212
Total Ammonia	mg/L	0.070	0.133	0.194	0.310	0.357	0.408	0.472	0.514	0.545	0.581	0.617	0.647
Nitrate	mg/L	0.35	0.66	0.97	1.73	2.04	2.32	2.69	2.91	3.06	3.24	3.41	3.56
Nitrite	mg/L	0.054	0.102	0.150	0.204	0.226	0.260	0.301	0.331	0.358	0.388	0.417	0.441
Alkalinity	mg/L	16	18	21	27	28	29	32	33	35	36	37	39
OrthoPhosphate-P	mg/L	0.0107	0.0195	0.0282	0.0364	0.0395	0.0455	0.0523	0.0579	0.0629	0.0684	0.0737	0.0783
Phosphate-P	mg/L	0.0142	0.0229	0.0315	0.0406	0.0434	0.0492	0.0561	0.0615	0.0664	0.0718	0.0771	0.0816
Org. Carbon	mg/L	3.0	2.9	2.8	3.6	3.6	3.5	3.6	3.5	3.4	3.3	3.3	3.2
Hardness CaCO3	mg/L	23	29	35	45	47	51	57	60	63	66	70	73
Total Metals													
Aluminum Al	mg/L	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Antimony Sb	mg/L	0.0007	0.0012	0.0018	0.0037	0.0045	0.0051	0.0059	0.0063	0.0065	0.0068	0.0070	0.0073
Arsenic As	mg/L	0.0003	0.0004	0.0006	0.0009	0.0010	0.0011	0.0013	0.0014	0.0014	0.0015	0.0016	0.0017
Barium Ba	mg/L	0.0015	0.0022	0.0028	0.0037	0.0039	0.0044	0.0049	0.0053	0.0057	0.0061	0.0064	0.0067
Beryllium Be	mg/L	0.00012	0.00014	0.00016	0.00025	0.00027	0.00029	0.00032	0.00033	0.00033	0.00034	0.00035	0.00036
Bismuth Bi	mg/L	0.00057	0.00108	0.00159	0.00346	0.00423	0.00480	0.00557	0.00594	0.00614	0.00640	0.00666	0.00687
Boron B	mg/L	0.007	0.008	0.009	0.013	0.014	0.015	0.017	0.017	0.018	0.018	0.019	0.019
Cadmium Cd	mg/L	0.0000044	0.0000075	0.0000105	0.0000171	0.0000196	0.0000222	0.0000256	0.0000277	0.0000292	0.0000309	0.0000326	0.0000341
Calcium Ca	mg/L	21	38	54	71	77	88	101	112	121	132	142	151
Chromium Cr	mg/L	0.001	0.001	0.001	0.002	0.002	0.002	0.003	0.003	0.003	0.004	0.004	0.004
Cobalt Co	mg/L	0.0008	0.0015	0.0022	0.0029	0.0032	0.0037	0.0042	0.0047	0.0051	0.0055	0.0059	0.0063
Copper Cu	mg/L	0.0011	0.0017	0.0023	0.0030	0.0032	0.0036	0.0041	0.0045	0.0048	0.0052	0.0055	0.0058
Iron Fe	mg/L	0.02	0.02	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Lead Pb	mg/L	0.00005	0.00007	0.00009	0.00014	0.00016	0.00018	0.00020	0.00021	0.00022	0.00023	0.00024	0.00025
Lithium Li	mg/L	0.0019	0.0020	0.0022	0.0029	0.0029	0.0031	0.0033	0.0034	0.0034	0.0035	0.0035	0.0036
Magnesium Mg	mg/L	2.5	2.9	3.3	4.4	4.6	4.9	5.4	5.6	5.8	6.0	6.2	6.4
Manganese Mn	mg/L	0.002	0.004	0.006	0.008	0.009	0.010	0.012	0.013	0.014	0.015	0.016	0.017
Mercury Hg	mg/L	0.0000006	0.0000010	0.0000013	0.0000019	0.0000022	0.0000024	0.0000028	0.0000030	0.0000031	0.0000033	0.0000034	0.0000036
Molybdenum Mo	mg/L	0.00072	0.00134	0.00194	0.00252	0.00275	0.00316	0.00364	0.00403	0.00437	0.00476	0.00513	0.00545
Nickel Ni	mg/L	0.0008	0.0013	0.0019	0.0026	0.0028	0.0032	0.0036	0.0039	0.0042	0.0045	0.0048	0.0051
Phosphorus P	mg/L	0.020	0.033	0.047	0.065	0.071	0.081	0.093	0.102	0.109	0.117	0.126	0.133
Potassium K	mg/L	3.8	6.6	9.3	12.1	13.1	14.9	17.1	18.9	20.4	22.1	23.8	25.2
Selenium Se	mg/L	0.00022	0.00023	0.00024	0.00032	0.00032	0.00033	0.00035	0.00035	0.00035	0.00036	0.00036	0.00037
Silicon SiO2	mg/L	0.70	0.92	1.14	1.51	1.59	1.75	1.96	2.09	2.20	2.33	2.46	2.57
Silver Ag	mg/L	0.0000525	0.0000537	0.0000548	0.0000782	0.0000802	0.0000807	0.0000842	0.0000843	0.0000835	0.0000836	0.0000838	0.0000838
Sodium Na	mg/L	11	13	16	20	21	23	25	26	28	29	30	32
Strontium Sr	mg/L	0.017	0.021	0.026	0.034	0.036	0.040	0.044	0.047	0.050	0.053	0.055	0.058
Tellurium Te	mg/L	0.025	0.024	0.024	0.030	0.029	0.029	0.030	0.029	0.028	0.028	0.027	0.027
Thallium Tl	mg/L	0.000017	0.000018	0.000019	0.000026	0.000026	0.000027	0.000029	0.000030	0.000030	0.000031	0.000031	0.000032
Thorium Th	mg/L				0.000007	0.000010	0.000011	0.000013	0.000013	0.000013	0.000013	0.000012	0.000012
Tin Sn	mg/L	0.00013	0.00021	0.00028	0.00058	0.00071	0.00080	0.00093	0.00098	0.00101	0.00104	0.00108	0.00111
Titanium Ti	mg/L	0.0030	0.0030	0.0029	0.0039	0.0038	0.0038	0.0040	0.0039	0.0038	0.0038	0.0037	0.0037
Uranium U	mg/L	0.000025	0.000025	0.000024	0.000038	0.000040	0.000040	0.000042	0.000042	0.000040	0.000040	0.000039	0.000038
Vanadium V	mg/L	0.0004	0.0006	0.0007	0.0011	0.0013	0.0014	0.0016	0.0017	0.0017	0.0018	0.0019	0.0020
Zinc Zn	mg/L	0.0020	0.0034	0.0049	0.0066	0.0072	0.0083	0.0097	0.0106	0.0114	0.0123	0.0132	0.0139
Zirconium Zr	mg/L	0.0025	0.0024	0.0023	0.0032	0.0031	0.0031	0.0032	0.0032	0.0031	0.0030	0.0029	0.0029

Table H-1-A-2
Scenario 1

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter													
TDS	mg/L	372	388	405	430	418	429	450	460	468	480	491	501
TSS	mg/L	2.3	2.3	2.3	2.6	2.5	2.5	2.6	2.6	2.6	2.6	2.6	2.6
Free CN	mg/L	0.00426	0.00450	0.00474	0.00495	0.00479	0.00495	0.00521	0.00536	0.00549	0.00567	0.00584	0.00599
Total CN	mg/L	0.042	0.044	0.047	0.049	0.047	0.049	0.052	0.053	0.054	0.056	0.058	0.059
WAD CN	mg/L	0.0057	0.0060	0.0063	0.0066	0.0064	0.0066	0.0069	0.0071	0.0073	0.0076	0.0078	0.0080
CNO	mg/L	4.69	4.95	5.21	5.44	5.27	5.45	5.73	5.90	6.04	6.23	6.42	6.58
SCN	mg/L	0.064	0.067	0.071	0.074	0.072	0.074	0.078	0.080	0.082	0.085	0.088	0.090
Sulphate	mg/L	59.1	62.1	65.2	69.2	67.5	69.7	73.3	75.3	76.9	79.1	81.2	83.1
Chloride	mg/L	223	233	243	262	257	265	279	286	291	298	305	310
Total Ammonia	mg/L	0.681	0.711	0.742	0.811	0.801	0.828	0.874	0.896	0.909	0.930	0.951	0.968
Nitrate	mg/L	3.73	3.87	4.02	4.48	4.46	4.62	4.89	4.99	5.05	5.15	5.25	5.33
Nitrite	mg/L	0.469	0.494	0.519	0.548	0.534	0.552	0.581	0.597	0.610	0.628	0.646	0.661
Alkalinity	mg/L	40	41	43	46	45	46	48	49	49	50	51	52
OrthoPhosphate-P	mg/L	0.0834	0.0880	0.0926	0.0969	0.0939	0.0969	0.1019	0.1048	0.1073	0.1107	0.1140	0.1168
Phosphate-P	mg/L	0.0866	0.0911	0.0957	0.1006	0.0974	0.1004	0.1053	0.1082	0.1106	0.1139	0.1172	0.1200
Org. Carbon	mg/L	3.1	3.1	3.0	3.5	3.5	3.5	3.6	3.5	3.4	3.4	3.3	3.2
Hardness CaCO3	mg/L	76	79	82	87	85	87	91	93	94	97	99	100
Total Metals													
Aluminum Al	mg/L	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0076	0.0078	0.0080	0.0092	0.0093	0.0096	0.0102	0.0104	0.0105	0.0106	0.0108	0.0109
Arsenic As	mg/L	0.0018	0.0019	0.0020	0.0021	0.0021	0.0022	0.0023	0.0023	0.0024	0.0024	0.0025	0.0025
Barium Ba	mg/L	0.0071	0.0074	0.0077	0.0082	0.0080	0.0083	0.0087	0.0089	0.0090	0.0093	0.0095	0.0097
Beryllium Be	mg/L	0.00037	0.00037	0.00038	0.00044	0.00044	0.00045	0.00047	0.00047	0.00047	0.00048	0.00048	0.00048
Bismuth Bi	mg/L	0.00712	0.00734	0.00756	0.00874	0.00883	0.00914	0.00970	0.00988	0.00993	0.01006	0.01019	0.01030
Boron B	mg/L	0.020	0.020	0.021	0.023	0.023	0.023	0.025	0.025	0.025	0.025	0.025	0.026
Cadmium Cd	mg/L	0.0000358	0.0000373	0.0000387	0.0000427	0.0000423	0.0000437	0.0000461	0.0000472	0.0000478	0.0000488	0.0000498	0.0000506
Calcium Ca	mg/L	160	169	178	186	181	187	196	202	207	213	219	225
Chromium Cr	mg/L	0.004	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.006	0.006	0.006
Cobalt Co	mg/L	0.0067	0.0070	0.0074	0.0078	0.0076	0.0078	0.0082	0.0084	0.0086	0.0089	0.0092	0.0094
Copper Cu	mg/L	0.0062	0.0065	0.0068	0.0072	0.0070	0.0072	0.0076	0.0078	0.0079	0.0081	0.0083	0.0085
Iron Fe	mg/L	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00026	0.00027	0.00028	0.00031	0.00031	0.00032	0.00034	0.00034	0.00035	0.00035	0.00036	0.00036
Lithium Li	mg/L	0.0037	0.0037	0.0038	0.0043	0.0042	0.0042	0.0044	0.0044	0.0044	0.0045	0.0045	0.0045
Magnesium Mg	mg/L	6.6	6.8	7.0	7.7	7.5	7.7	8.0	8.2	8.2	8.3	8.5	8.6
Manganese Mn	mg/L	0.018	0.019	0.020	0.022	0.021	0.022	0.023	0.023	0.024	0.025	0.025	0.026
Mercury Hg	mg/L	0.0000038	0.0000039	0.0000041	0.0000045	0.0000044	0.0000045	0.0000048	0.0000049	0.0000050	0.0000051	0.0000052	0.0000052
Molybdenum Mo	mg/L	0.00580	0.00612	0.00644	0.00674	0.00654	0.00675	0.00710	0.00730	0.00748	0.00771	0.00794	0.00814
Nickel Ni	mg/L	0.0054	0.0057	0.0059	0.0063	0.0062	0.0064	0.0067	0.0069	0.0070	0.0072	0.0074	0.0075
Phosphorus P	mg/L	0.140	0.147	0.154	0.164	0.160	0.166	0.174	0.179	0.182	0.187	0.192	0.196
Potassium K	mg/L	26.8	28.3	29.7	31.2	30.2	31.2	32.7	33.7	34.4	35.5	36.5	37.4
Selenium Se	mg/L	0.00037	0.00037	0.00038	0.00043	0.00042	0.00043	0.00044	0.00044	0.00044	0.00044	0.00044	0.00045
Silicon SiO2	mg/L	2.70	2.80	2.91	3.13	3.05	3.14	3.28	3.35	3.40	3.48	3.56	3.62
Silver Ag	mg/L	0.0000841	0.0000842	0.0000844	0.0000995	0.0000993	0.0000994	0.0001021	0.0001017	0.0001006	0.0001004	0.0001002	0.0001000
Sodium Na	mg/L	33	34	35	38	37	38	40	40	41	42	43	43
Strontium Sr	mg/L	0.061	0.063	0.066	0.070	0.068	0.070	0.074	0.075	0.076	0.078	0.080	0.081
Tellurium Te	mg/L	0.026	0.026	0.025	0.029	0.029	0.029	0.029	0.029	0.028	0.028	0.027	0.027
Thallium Tl	mg/L	0.000032	0.000033	0.000033	0.000037	0.000037	0.000037	0.000039	0.000039	0.000039	0.000039	0.000040	0.000040
Thorium Th	mg/L	0.000012	0.000012	0.000011	0.000016	0.000017	0.000018	0.000020	0.000020	0.000019	0.000019	0.000018	0.000018
Tin Sn	mg/L	0.00115	0.00118	0.00121	0.00140	0.00142	0.00147	0.00156	0.00159	0.00159	0.00161	0.00162	0.00164
Titanium Ti	mg/L	0.0036	0.0036	0.0035	0.0042	0.0041	0.0041	0.0042	0.0042	0.0041	0.0040	0.0040	0.0040
Uranium U	mg/L	0.000038	0.000037	0.000036	0.000046	0.000047	0.000047	0.000048	0.000048	0.000047	0.000046	0.000045	0.000045
Vanadium V	mg/L	0.0020	0.0021	0.0022	0.0024	0.0024	0.0025	0.0026	0.0027	0.0027	0.0027	0.0028	0.0028
Zinc Zn	mg/L	0.0147	0.0155	0.0162	0.0172	0.0167	0.0173	0.0183	0.0188	0.0191	0.0197	0.0202	0.0206
Zirconium Zr	mg/L	0.0028	0.0028	0.0027	0.0033	0.0032	0.0032	0.0033	0.0033	0.0032	0.0031	0.0031	0.0030

Table H-1-A-2
Scenario 1

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter													
TDS	mg/L	507	516	525	542	520	522	534	535	539	546	554	561
TSS	mg/L	2.6	2.6	2.5	2.8	2.7	2.7	2.7	2.6	2.6	2.6	2.6	2.6
Free CN	mg/L	0.00591	0.00588	0.00585	0.00582	0.00542	0.00532	0.00531	0.00522	0.00516	0.00513	0.00511	0.00509
Total CN	mg/L	0.058	0.058	0.058	0.057	0.054	0.053	0.053	0.052	0.051	0.051	0.051	0.050
WAD CN	mg/L	0.0079	0.0078	0.0078	0.0078	0.0072	0.0071	0.0071	0.0070	0.0069	0.0068	0.0068	0.0068
CNO	mg/L	6.51	6.47	6.44	6.40	5.96	5.85	5.85	5.74	5.68	5.65	5.62	5.60
SCN	mg/L	0.089	0.088	0.088	0.087	0.081	0.080	0.080	0.078	0.077	0.077	0.077	0.076
Sulphate	mg/L	82.4	82.2	82.1	82.9	78.0	77.1	77.6	76.6	76.0	75.9	75.8	75.7
Chloride	mg/L	318	328	338	354	345	351	363	368	373	381	390	397
Total Ammonia	mg/L	0.963	0.963	0.964	0.994	0.948	0.943	0.957	0.948	0.942	0.942	0.943	0.944
Nitrate	mg/L	5.27	5.25	5.23	5.44	5.21	5.18	5.25	5.19	5.13	5.11	5.09	5.08
Nitrite	mg/L	0.668	0.679	0.691	0.707	0.675	0.678	0.692	0.694	0.699	0.708	0.718	0.727
Alkalinity	mg/L	51	51	50	52	49	49	49	48	48	48	47	47
OrthoPhosphate-P	mg/L	0.1205	0.1247	0.1290	0.1331	0.1286	0.1308	0.1351	0.1371	0.1398	0.1434	0.1471	0.1504
Phosphate-P	mg/L	0.1236	0.1278	0.1321	0.1367	0.1320	0.1343	0.1385	0.1405	0.1431	0.1467	0.1504	0.1537
Org. Carbon	mg/L	3.2	3.2	3.2	3.6	3.6	3.6	3.7	3.6	3.6	3.5	3.5	3.5
Hardness CaCO3	mg/L	99	99	98	100	95	93	94	92	91	91	90	90
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0110	0.0113	0.0115	0.0125	0.0123	0.0126	0.0130	0.0131	0.0132	0.0134	0.0136	0.0138
Arsenic As	mg/L	0.0025	0.0025	0.0025	0.0025	0.0024	0.0024	0.0024	0.0024	0.0023	0.0023	0.0023	0.0023
Barium Ba	mg/L	0.0096	0.0095	0.0095	0.0096	0.0091	0.0089	0.0090	0.0089	0.0088	0.0087	0.0087	0.0087
Beryllium Be	mg/L	0.00049	0.00049	0.00049	0.00054	0.00053	0.00053	0.00054	0.00054	0.00054	0.00055	0.00055	0.00055
Bismuth Bi	mg/L	0.01046	0.01068	0.01091	0.01189	0.01178	0.01201	0.01248	0.01259	0.01269	0.01287	0.01305	0.01323
Boron B	mg/L	0.025	0.025	0.026	0.027	0.026	0.026	0.027	0.026	0.026	0.026	0.026	0.026
Cadmium Cd	mg/L	0.0000500	0.0000498	0.0000496	0.0000506	0.0000479	0.0000474	0.0000477	0.0000470	0.0000465	0.0000463	0.0000461	0.0000459
Calcium Ca	mg/L	222	221	220	219	204	201	201	197	195	194	193	193
Chromium Cr	mg/L	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005
Cobalt Co	mg/L	0.0093	0.0092	0.0092	0.0092	0.0086	0.0085	0.0085	0.0084	0.0083	0.0083	0.0082	0.0082
Copper Cu	mg/L	0.0084	0.0084	0.0084	0.0084	0.0079	0.0078	0.0078	0.0076	0.0076	0.0075	0.0075	0.0075
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00036	0.00036	0.00036	0.00038	0.00037	0.00037	0.00037	0.00037	0.00037	0.00037	0.00037	0.00037
Lithium Li	mg/L	0.0045	0.0045	0.0045	0.0048	0.0046	0.0046	0.0046	0.0046	0.0045	0.0045	0.0045	0.0045
Magnesium Mg	mg/L	8.5	8.5	8.5	8.8	8.4	8.4	8.5	8.4	8.3	8.3	8.3	8.3
Manganese Mn	mg/L	0.026	0.025	0.025	0.025	0.024	0.023	0.024	0.023	0.023	0.023	0.023	0.023
Mercury Hg	mg/L	0.0000052	0.0000052	0.0000051	0.0000053	0.0000050	0.0000049	0.0000050	0.0000049	0.0000049	0.0000048	0.0000048	0.0000048
Molybdenum Mo	mg/L	0.00804	0.00800	0.00796	0.00793	0.00740	0.00727	0.00727	0.00714	0.00706	0.00703	0.00700	0.00697
Nickel Ni	mg/L	0.0075	0.0074	0.0074	0.0075	0.0071	0.0070	0.0071	0.0070	0.0069	0.0069	0.0069	0.0069
Phosphorus P	mg/L	0.200	0.204	0.208	0.215	0.206	0.208	0.213	0.214	0.216	0.220	0.223	0.227
Potassium K	mg/L	37.0	36.8	36.6	36.5	34.1	33.5	33.5	32.9	32.5	32.4	32.2	32.1
Selenium Se	mg/L	0.00044	0.00044	0.00044	0.00047	0.00045	0.00045	0.00045	0.00045	0.00044	0.00044	0.00044	0.00044
Silicon SiO2	mg/L	3.58	3.57	3.55	3.62	3.41	3.36	3.38	3.33	3.29	3.27	3.26	3.25
Silver Ag	mg/L	0.0000993	0.0000994	0.0000994	0.0001101	0.0001081	0.0001075	0.0001089	0.0001078	0.0001070	0.0001069	0.0001069	0.0001070
Sodium Na	mg/L	43	43	42	43	41	41	41	40	40	39	39	39
Strontium Sr	mg/L	0.080	0.080	0.080	0.081	0.077	0.076	0.076	0.075	0.074	0.074	0.073	0.073
Tellurium Te	mg/L	0.027	0.026	0.026	0.030	0.030	0.030	0.030	0.030	0.029	0.029	0.029	0.029
Thallium Tl	mg/L	0.000039	0.000039	0.000039	0.000041	0.000040	0.000040	0.000040	0.000040	0.000039	0.000039	0.000039	0.000039
Thorium Th	mg/L	0.000018	0.000018	0.000018	0.000020	0.000020	0.000020	0.000021	0.000021	0.000020	0.000020	0.000020	0.000020
Tin Sn	mg/L	0.00166	0.00169	0.00173	0.00188	0.00187	0.00191	0.00199	0.00200	0.00202	0.00204	0.00207	0.00209
Titanium Ti	mg/L	0.0039	0.0039	0.0039	0.0044	0.0043	0.0043	0.0044	0.0044	0.0044	0.0043	0.0043	0.0043
Uranium U	mg/L	0.000044	0.000044	0.000044	0.000050	0.000050	0.000049	0.000050	0.000050	0.000049	0.000049	0.000049	0.000049
Vanadium V	mg/L	0.0028	0.0029	0.0029	0.0031	0.0030	0.0030	0.0031	0.0031	0.0031	0.0031	0.0031	0.0031
Zinc Zn	mg/L	0.0204	0.0204	0.0203	0.0205	0.0192	0.0190	0.0192	0.0189	0.0187	0.0187	0.0186	0.0186
Zirconium Zr	mg/L	0.0030	0.0030	0.0030	0.0034	0.0033	0.0033	0.0034	0.0034	0.0033	0.0033	0.0033	0.0033

Table H-1-A-2
Scenario 1

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter													
TDS	mg/L	559	558	556	562	533	527	529	522	517	515	514	513
TSS	mg/L	2.6	2.6	2.6	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.6	2.6
Free CN	mg/L	0.00507	0.00506	0.00504	0.00503	0.00474	0.00467	0.00468	0.00462	0.00458	0.00456	0.00455	0.00454
Total CN	mg/L	0.050	0.050	0.050	0.050	0.047	0.046	0.047	0.046	0.045	0.045	0.045	0.045
WAD CN	mg/L	0.0068	0.0067	0.0067	0.0067	0.0063	0.0062	0.0062	0.0062	0.0061	0.0061	0.0061	0.0061
CNO	mg/L	5.58	5.56	5.55	5.53	5.21	5.14	5.15	5.08	5.03	5.02	5.00	5.00
SCN	mg/L	0.076	0.076	0.076	0.075	0.071	0.070	0.070	0.069	0.069	0.068	0.068	0.068
Sulphate	mg/L	75.4	75.3	75.0	74.9	70.7	69.8	69.9	69.0	68.4	68.2	68.0	67.9
Chloride	mg/L	396	395	394	394	372	368	369	364	361	360	359	358
Total Ammonia	mg/L	0.940	0.938	0.935	0.944	0.897	0.888	0.893	0.882	0.874	0.872	0.869	0.868
Nitrate	mg/L	5.06	5.05	5.03	5.11	4.87	4.83	4.87	4.81	4.77	4.75	4.74	4.73
Nitrite	mg/L	0.724	0.723	0.721	0.720	0.680	0.672	0.673	0.664	0.658	0.656	0.655	0.654
Alkalinity	mg/L	47	47	47	48	46	46	46	46	45	45	45	45
OrthoPhosphate-P	mg/L	0.1499	0.1495	0.1491	0.1487	0.1402	0.1383	0.1386	0.1366	0.1354	0.1350	0.1347	0.1344
Phosphate-P	mg/L	0.1531	0.1527	0.1523	0.1524	0.1437	0.1419	0.1421	0.1401	0.1389	0.1385	0.1381	0.1379
Org. Carbon	mg/L	3.5	3.5	3.5	3.9	3.8	3.8	3.9	3.9	3.8	3.8	3.8	3.8
Hardness CaCO3	mg/L	89	89	89	91	87	86	87	85	85	84	84	84
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0137	0.0137	0.0136	0.0136	0.0128	0.0127	0.0127	0.0125	0.0124	0.0124	0.0123	0.0123
Arsenic As	mg/L	0.0023	0.0023	0.0023	0.0023	0.0022	0.0022	0.0022	0.0022	0.0021	0.0021	0.0021	0.0021
Barium Ba	mg/L	0.0087	0.0086	0.0086	0.0087	0.0082	0.0082	0.0082	0.0081	0.0080	0.0080	0.0080	0.0080
Beryllium Be	mg/L	0.00055	0.00055	0.00055	0.00056	0.00054	0.00053	0.00053	0.00053	0.00052	0.00052	0.00052	0.00052
Bismuth Bi	mg/L	0.01318	0.01315	0.01311	0.01307	0.01232	0.01216	0.01218	0.01201	0.01190	0.01186	0.01184	0.01181
Boron B	mg/L	0.026	0.026	0.026	0.027	0.026	0.026	0.026	0.025	0.025	0.025	0.025	0.025
Cadmium Cd	mg/L	0.0000458	0.0000456	0.0000455	0.0000465	0.0000444	0.0000441	0.0000445	0.0000440	0.0000436	0.0000435	0.0000434	0.0000433
Calcium Ca	mg/L	192	192	191	191	180	178	178	175	174	173	173	173
Chromium Cr	mg/L	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Cobalt Co	mg/L	0.0082	0.0082	0.0081	0.0081	0.0077	0.0076	0.0076	0.0075	0.0074	0.0074	0.0074	0.0074
Copper Cu	mg/L	0.0075	0.0074	0.0074	0.0074	0.0071	0.0070	0.0070	0.0069	0.0068	0.0068	0.0068	0.0068
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00037	0.00037	0.00037	0.00037	0.00035	0.00035	0.00035	0.00035	0.00034	0.00034	0.00034	0.00034
Lithium Li	mg/L	0.0045	0.0045	0.0045	0.0047	0.0045	0.0045	0.0045	0.0045	0.0044	0.0044	0.0044	0.0044
Magnesium Mg	mg/L	8.2	8.2	8.2	8.4	8.1	8.0	8.1	8.0	7.9	7.9	7.9	7.9
Manganese Mn	mg/L	0.023	0.023	0.023	0.022	0.021	0.021	0.021	0.021	0.021	0.020	0.020	0.020
Mercury Hg	mg/L	0.0000048	0.0000048	0.0000048	0.0000049	0.0000046	0.0000046	0.0000046	0.0000046	0.0000046	0.0000045	0.0000045	0.0000045
Molybdenum Mo	mg/L	0.00695	0.00693	0.00691	0.00689	0.00650	0.00642	0.00643	0.00634	0.00628	0.00626	0.00625	0.00623
Nickel Ni	mg/L	0.0069	0.0069	0.0069	0.0069	0.0065	0.0064	0.0064	0.0063	0.0063	0.0063	0.0062	0.0062
Phosphorus P	mg/L	0.226	0.225	0.225	0.225	0.213	0.210	0.211	0.208	0.206	0.205	0.205	0.204
Potassium K	mg/L	32.0	31.9	31.8	31.8	30.0	29.6	29.7	29.3	29.0	29.0	28.9	28.8
Selenium Se	mg/L	0.00043	0.00043	0.00043	0.00046	0.00045	0.00045	0.00045	0.00045	0.00044	0.00044	0.00044	0.00044
Silicon SiO2	mg/L	3.24	3.23	3.22	3.28	3.12	3.09	3.11	3.07	3.04	3.03	3.02	3.02
Silver Ag	mg/L	0.0001066	0.0001063	0.0001060	0.0001135	0.0001106	0.0001095	0.0001101	0.0001087	0.0001078	0.0001074	0.0001072	0.0001070
Sodium Na	mg/L	39	39	39	40	38	38	38	37	37	37	37	37
Strontium Sr	mg/L	0.073	0.073	0.073	0.074	0.070	0.070	0.070	0.069	0.069	0.068	0.068	0.068
Tellurium Te	mg/L	0.029	0.029	0.029	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.031	0.031
Thallium Tl	mg/L	0.000038	0.000038	0.000038	0.000040	0.000039	0.000039	0.000040	0.000039	0.000039	0.000039	0.000039	0.000039
Thorium Th	mg/L	0.000020	0.000020	0.000020	0.000022	0.000022	0.000022	0.000023	0.000023	0.000022	0.000022	0.000022	0.000022
Tin Sn	mg/L	0.00209	0.00208	0.00208	0.00208	0.00197	0.00195	0.00195	0.00193	0.00191	0.00191	0.00190	0.00190
Titanium Ti	mg/L	0.0043	0.0043	0.0043	0.0047	0.0046	0.0046	0.0046	0.0046	0.0046	0.0045	0.0045	0.0045
Uranium U	mg/L	0.000049	0.000048	0.000048	0.000053	0.000053	0.000053	0.000054	0.000053	0.000053	0.000052	0.000052	0.000052
Vanadium V	mg/L	0.0031	0.0031	0.0031	0.0031	0.0030	0.0029	0.0029	0.0029	0.0029	0.0029	0.0029	0.0029
Zinc Zn	mg/L	0.0185	0.0185	0.0184	0.0184	0.0174	0.0172	0.0173	0.0171	0.0170	0.0169	0.0169	0.0168
Zirconium Zr	mg/L	0.0033	0.0033	0.0033	0.0036	0.0036	0.0036	0.0037	0.0036	0.0036	0.0036	0.0036	0.0036

Table H-1-A-2
Scenario 1

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter													
TDS	mg/L	512	511	510	515	491	487	489	483	479	477	476	476
TSS	mg/L	2.6	2.6	2.6	2.8	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Free CN	mg/L	0.00453	0.00452	0.00451	0.00450	0.00427	0.00422	0.00423	0.00417	0.00414	0.00413	0.00412	0.00411
Total CN	mg/L	0.045	0.045	0.045	0.045	0.043	0.042	0.042	0.042	0.041	0.041	0.041	0.041
WAD CN	mg/L	0.0060	0.0060	0.0060	0.0060	0.0057	0.0056	0.0056	0.0056	0.0055	0.0055	0.0055	0.0055
CNO	mg/L	4.99	4.98	4.96	4.95	4.69	4.64	4.65	4.59	4.55	4.54	4.53	4.52
SCN	mg/L	0.068	0.068	0.068	0.067	0.064	0.063	0.063	0.063	0.062	0.062	0.062	0.062
Sulphate	mg/L	67.8	67.6	67.4	67.3	64.0	63.3	63.4	62.6	62.1	61.9	61.8	61.7
Chloride	mg/L	357	357	356	356	339	335	336	332	329	329	328	327
Total Ammonia	mg/L	0.866	0.864	0.862	0.870	0.832	0.825	0.830	0.821	0.814	0.812	0.810	0.809
Nitrate	mg/L	4.72	4.71	4.70	4.77	4.57	4.54	4.58	4.53	4.49	4.48	4.47	4.46
Nitrite	mg/L	0.652	0.651	0.649	0.649	0.617	0.611	0.612	0.605	0.600	0.598	0.597	0.596
Alkalinity	mg/L	45	45	45	46	44	44	44	44	44	43	43	43
OrthoPhosphate-P	mg/L	0.1342	0.1339	0.1335	0.1332	0.1264	0.1251	0.1253	0.1237	0.1227	0.1224	0.1221	0.1219
Phosphate-P	mg/L	0.1377	0.1373	0.1370	0.1370	0.1301	0.1287	0.1290	0.1274	0.1263	0.1260	0.1257	0.1255
Org. Carbon	mg/L	3.8	3.8	3.8	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.0	4.0
Hardness CaCO3	mg/L	84	84	84	85	82	81	82	81	80	80	80	80
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0123	0.0123	0.0122	0.0122	0.0116	0.0115	0.0115	0.0113	0.0113	0.0112	0.0112	0.0112
Arsenic As	mg/L	0.0021	0.0021	0.0021	0.0021	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
Barium Ba	mg/L	0.0079	0.0079	0.0079	0.0080	0.0076	0.0076	0.0076	0.0075	0.0074	0.0074	0.0074	0.0074
Beryllium Be	mg/L	0.00052	0.00052	0.00052	0.00053	0.00051	0.00050	0.00051	0.00050	0.00050	0.00049	0.00049	0.00049
Bismuth Bi	mg/L	0.01179	0.01177	0.01174	0.01170	0.01110	0.01098	0.01100	0.01086	0.01078	0.01075	0.01072	0.01070
Boron B	mg/L	0.025	0.025	0.025	0.026	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.024
Cadmium Cd	mg/L	0.0000432	0.0000431	0.0000430	0.0000439	0.0000422	0.0000420	0.0000423	0.0000419	0.0000415	0.0000414	0.0000413	0.0000413
Calcium Ca	mg/L	172	172	172	171	163	161	161	159	158	158	157	157
Chromium Cr	mg/L	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004
Cobalt Co	mg/L	0.0073	0.0073	0.0073	0.0073	0.0069	0.0068	0.0069	0.0068	0.0067	0.0067	0.0067	0.0067
Copper Cu	mg/L	0.0068	0.0068	0.0067	0.0068	0.0065	0.0064	0.0064	0.0063	0.0063	0.0063	0.0062	0.0062
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00034	0.00034	0.00034	0.00035	0.00033	0.00033	0.00033	0.00033	0.00032	0.00032	0.00032	0.00032
Lithium Li	mg/L	0.0044	0.0044	0.0044	0.0046	0.0044	0.0044	0.0044	0.0044	0.0043	0.0043	0.0043	0.0043
Magnesium Mg	mg/L	7.9	7.8	7.8	8.0	7.7	7.7	7.8	7.7	7.6	7.6	7.6	7.6
Manganese Mn	mg/L	0.020	0.020	0.020	0.020	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019
Mercury Hg	mg/L	0.0000045	0.0000045	0.0000045	0.0000046	0.0000044	0.0000044	0.0000044	0.0000044	0.0000043	0.0000043	0.0000043	0.0000043
Molybdenum Mo	mg/L	0.00622	0.00621	0.00619	0.00618	0.00586	0.00580	0.00581	0.00574	0.00569	0.00567	0.00566	0.00565
Nickel Ni	mg/L	0.0062	0.0062	0.0062	0.0062	0.0059	0.0058	0.0059	0.0058	0.0057	0.0057	0.0057	0.0057
Phosphorus P	mg/L	0.204	0.204	0.203	0.203	0.193	0.191	0.192	0.190	0.188	0.188	0.187	0.187
Potassium K	mg/L	28.8	28.7	28.6	28.6	27.2	26.9	27.0	26.6	26.4	26.4	26.3	26.3
Selenium Se	mg/L	0.00044	0.00044	0.00044	0.00046	0.00045	0.00045	0.00045	0.00045	0.00045	0.00044	0.00044	0.00044
Silicon SiO2	mg/L	3.01	3.01	3.00	3.05	2.92	2.90	2.91	2.88	2.86	2.85	2.84	2.84
Silver Ag	mg/L	0.0001068	0.0001065	0.0001063	0.0001129	0.0001104	0.0001094	0.0001100	0.0001088	0.0001079	0.0001076	0.0001073	0.0001072
Sodium Na	mg/L	37	37	36	37	36	36	36	35	35	35	35	35
Strontium Sr	mg/L	0.068	0.068	0.068	0.069	0.066	0.065	0.066	0.065	0.064	0.064	0.064	0.064
Tellurium Te	mg/L	0.031	0.031	0.031	0.034	0.033	0.034	0.034	0.034	0.034	0.033	0.033	0.033
Thallium Tl	mg/L	0.000038	0.000038	0.000038	0.000040	0.000039	0.000039	0.000039	0.000039	0.000039	0.000039	0.000039	0.000039
Thorium Th	mg/L	0.000022	0.000022	0.000022	0.000024	0.000024	0.000024	0.000024	0.000024	0.000024	0.000024	0.000024	0.000024
Tin Sn	mg/L	0.00189	0.00189	0.00189	0.00189	0.00180	0.00178	0.00179	0.00177	0.00176	0.00175	0.00175	0.00174
Titanium Ti	mg/L	0.0045	0.0045	0.0045	0.0048	0.0047	0.0047	0.0048	0.0048	0.0047	0.0047	0.0047	0.0047
Uranium U	mg/L	0.000052	0.000052	0.000052	0.000056	0.000056	0.000056	0.000056	0.000056	0.000055	0.000055	0.000055	0.000055
Vanadium V	mg/L	0.0029	0.0028	0.0028	0.0029	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0026	0.0026
Zinc Zn	mg/L	0.0168	0.0168	0.0167	0.0167	0.0159	0.0158	0.0159	0.0157	0.0156	0.0155	0.0155	0.0155
Zirconium Zr	mg/L	0.0036	0.0035	0.0035	0.0039	0.0038	0.0038	0.0039	0.0038	0.0038	0.0038	0.0038	0.0038

Table H-1-A-2
Scenario 1

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter													
TDS	mg/L	475	474	473	477	458	454	456	451	448	446	445	445
TSS	mg/L	2.7	2.7	2.7	2.8	2.7	2.7	2.8	2.7	2.7	2.7	2.7	2.7
Free CN	mg/L	0.00410	0.00409	0.00409	0.00407	0.00388	0.00385	0.00385	0.00381	0.00378	0.00377	0.00376	0.00376
Total CN	mg/L	0.041	0.041	0.041	0.041	0.039	0.039	0.039	0.038	0.038	0.038	0.038	0.038
WAD CN	mg/L	0.0055	0.0055	0.0054	0.0054	0.0052	0.0051	0.0051	0.0051	0.0050	0.0050	0.0050	0.0050
CNO	mg/L	4.51	4.50	4.49	4.48	4.27	4.23	4.24	4.19	4.16	4.15	4.14	4.13
SCN	mg/L	0.062	0.061	0.061	0.061	0.058	0.058	0.058	0.057	0.057	0.057	0.056	0.056
Sulphate	mg/L	61.6	61.5	61.3	61.3	58.5	58.0	58.1	57.4	57.0	56.9	56.7	56.6
Chloride	mg/L	327	326	325	326	312	309	310	306	304	303	302	302
Total Ammonia	mg/L	0.807	0.806	0.804	0.811	0.780	0.775	0.779	0.771	0.766	0.764	0.762	0.761
Nitrate	mg/L	4.45	4.44	4.43	4.50	4.33	4.31	4.34	4.30	4.27	4.26	4.25	4.24
Nitrite	mg/L	0.595	0.594	0.592	0.592	0.566	0.561	0.562	0.556	0.552	0.551	0.549	0.549
Alkalinity	mg/L	43	43	43	44	43	43	43	43	42	42	42	42
OrthoPhosphate-P	mg/L	0.1217	0.1214	0.1211	0.1208	0.1153	0.1142	0.1144	0.1131	0.1123	0.1120	0.1117	0.1116
Phosphate-P	mg/L	0.1253	0.1250	0.1247	0.1248	0.1191	0.1180	0.1183	0.1169	0.1161	0.1157	0.1155	0.1153
Org. Carbon	mg/L	4.0	4.0	4.0	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.2	4.2
Hardness CaCO3	mg/L	80	79	79	81	78	77	78	77	77	76	76	76
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0112	0.0111	0.0111	0.0111	0.0106	0.0105	0.0105	0.0104	0.0103	0.0103	0.0103	0.0102
Arsenic As	mg/L	0.0020	0.0020	0.0020	0.0020	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019
Barium Ba	mg/L	0.0074	0.0074	0.0073	0.0074	0.0071	0.0071	0.0071	0.0070	0.0070	0.0070	0.0069	0.0069
Beryllium Be	mg/L	0.00049	0.00049	0.00049	0.00050	0.00048	0.00048	0.00048	0.00048	0.00047	0.00047	0.00047	0.00047
Bismuth Bi	mg/L	0.01069	0.01066	0.01064	0.01061	0.01012	0.01003	0.01004	0.00993	0.00986	0.00983	0.00981	0.00979
Boron B	mg/L	0.024	0.024	0.024	0.025	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024
Cadmium Cd	mg/L	0.0000412	0.0000411	0.0000410	0.0000418	0.0000404	0.0000402	0.0000405	0.0000402	0.0000399	0.0000398	0.0000397	0.0000396
Calcium Ca	mg/L	157	156	156	156	149	147	148	146	145	145	144	144
Chromium Cr	mg/L	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Cobalt Co	mg/L	0.0067	0.0066	0.0066	0.0066	0.0063	0.0063	0.0063	0.0062	0.0062	0.0061	0.0061	0.0061
Copper Cu	mg/L	0.0062	0.0062	0.0062	0.0062	0.0060	0.0059	0.0059	0.0059	0.0058	0.0058	0.0058	0.0058
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00032	0.00032	0.00032	0.00032	0.00031	0.00031	0.00031	0.00031	0.00031	0.00031	0.00031	0.00031
Lithium Li	mg/L	0.0043	0.0043	0.0043	0.0045	0.0043	0.0043	0.0044	0.0043	0.0043	0.0043	0.0043	0.0043
Magnesium Mg	mg/L	7.5	7.5	7.5	7.7	7.5	7.4	7.5	7.4	7.4	7.3	7.3	7.3
Manganese Mn	mg/L	0.019	0.019	0.018	0.018	0.018	0.017	0.018	0.017	0.017	0.017	0.017	0.017
Mercury Hg	mg/L	0.0000043	0.0000043	0.0000043	0.0000044	0.0000042	0.0000042	0.0000042	0.0000042	0.0000041	0.0000041	0.0000041	0.0000041
Molybdenum Mo	mg/L	0.00564	0.00563	0.00562	0.00560	0.00535	0.00530	0.00531	0.00525	0.00521	0.00519	0.00518	0.00518
Nickel Ni	mg/L	0.0057	0.0057	0.0057	0.0057	0.0054	0.0054	0.0054	0.0053	0.0053	0.0053	0.0053	0.0053
Phosphorus P	mg/L	0.186	0.186	0.186	0.186	0.178	0.176	0.177	0.175	0.174	0.173	0.173	0.172
Potassium K	mg/L	26.2	26.2	26.1	26.1	24.9	24.7	24.8	24.5	24.3	24.2	24.2	24.1
Selenium Se	mg/L	0.00044	0.00044	0.00044	0.00046	0.00045	0.00045	0.00046	0.00045	0.00045	0.00045	0.00045	0.00045
Silicon SiO2	mg/L	2.83	2.83	2.82	2.87	2.76	2.74	2.76	2.73	2.71	2.70	2.69	2.69
Silver Ag	mg/L	0.0001070	0.0001068	0.0001065	0.0001124	0.0001102	0.0001094	0.0001100	0.0001089	0.0001081	0.0001078	0.0001075	0.0001074
Sodium Na	mg/L	35	35	35	35	34	34	34	34	34	34	33	33
Strontium Sr	mg/L	0.064	0.064	0.064	0.065	0.062	0.062	0.062	0.062	0.061	0.061	0.061	0.061
Tellurium Te	mg/L	0.033	0.033	0.033	0.036	0.035	0.035	0.036	0.035	0.035	0.035	0.035	0.035
Thallium Tl	mg/L	0.000038	0.000038	0.000038	0.000040	0.000039	0.000039	0.000039	0.000039	0.000039	0.000039	0.000039	0.000039
Thorium Th	mg/L	0.000024	0.000024	0.000024	0.000025	0.000025	0.000025	0.000026	0.000026	0.000026	0.000025	0.000025	0.000025
Tin Sn	mg/L	0.00174	0.00174	0.00173	0.00174	0.00167	0.00165	0.00166	0.00164	0.00163	0.00162	0.00162	0.00162
Titanium Ti	mg/L	0.0047	0.0047	0.0047	0.0050	0.0049	0.0049	0.0049	0.0049	0.0049	0.0048	0.0048	0.0048
Uranium U	mg/L	0.000055	0.000055	0.000055	0.000059	0.000058	0.000058	0.000059	0.000058	0.000058	0.000058	0.000058	0.000057
Vanadium V	mg/L	0.0026	0.0026	0.0026	0.0026	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
Zinc Zn	mg/L	0.0154	0.0154	0.0154	0.0154	0.0147	0.0146	0.0147	0.0145	0.0144	0.0144	0.0144	0.0143
Zirconium Zr	mg/L	0.0038	0.0038	0.0038	0.0040	0.0040	0.0040	0.0041	0.0040	0.0040	0.0040	0.0040	0.0040

Table H-1-A-2
Scenario 1

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter													
TDS	mg/L	444	443	442	446	430	427	429	424	421	420	420	419
TSS	mg/L	2.7	2.7	2.7	2.8	2.8	2.8	2.8	2.8	2.8	2.7	2.7	2.7
Free CN	mg/L	0.00375	0.00374	0.00374	0.00372	0.00357	0.00354	0.00355	0.00351	0.00348	0.00348	0.00347	0.00346
Total CN	mg/L	0.038	0.038	0.037	0.037	0.036	0.036	0.036	0.035	0.035	0.035	0.035	0.035
WAD CN	mg/L	0.0050	0.0050	0.0050	0.0050	0.0048	0.0047	0.0047	0.0047	0.0046	0.0046	0.0046	0.0046
CNO	mg/L	4.13	4.12	4.11	4.10	3.93	3.89	3.90	3.86	3.83	3.82	3.81	3.81
SCN	mg/L	0.056	0.056	0.056	0.056	0.054	0.053	0.053	0.053	0.052	0.052	0.052	0.052
Sulphate	mg/L	56.6	56.4	56.3	56.2	53.9	53.5	53.6	53.1	52.7	52.6	52.5	52.4
Chloride	mg/L	302	301	300	301	289	287	288	285	283	282	281	281
Total Ammonia	mg/L	0.760	0.758	0.756	0.754	0.723	0.717	0.718	0.711	0.706	0.704	0.703	0.702
Nitrate	mg/L	4.24	4.23	4.22	4.20	4.03	4.00	4.00	3.96	3.93	3.92	3.92	3.91
Nitrite	mg/L	0.548	0.547	0.545	0.544	0.521	0.517	0.518	0.512	0.509	0.508	0.507	0.506
Alkalinity	mg/L	42	42	42	43	42	41	42	41	41	41	41	41
OrthoPhosphate-P	mg/L	0.1114	0.1112	0.1109	0.1107	0.1061	0.1052	0.1055	0.1043	0.1036	0.1034	0.1031	0.1030
Phosphate-P	mg/L	0.1151	0.1149	0.1146	0.1147	0.1100	0.1092	0.1094	0.1082	0.1075	0.1072	0.1070	0.1068
Org. Carbon	mg/L	4.2	4.2	4.2	4.5	4.4	4.4	4.5	4.5	4.4	4.4	4.4	4.4
Hardness CaCO3	mg/L	76	76	76	77	75	74	75	74	73	73	73	73
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0102	0.0102	0.0102	0.0102	0.0097	0.0097	0.0097	0.0096	0.0095	0.0095	0.0095	0.0095
Arsenic As	mg/L	0.0019	0.0019	0.0019	0.0019	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0017	0.0017
Barium Ba	mg/L	0.0069	0.0069	0.0069	0.0069	0.0067	0.0067	0.0067	0.0066	0.0066	0.0066	0.0066	0.0065
Beryllium Be	mg/L	0.00047	0.00047	0.00047	0.00048	0.00046	0.00046	0.00046	0.00045	0.00045	0.00045	0.00045	0.00045
Bismuth Bi	mg/L	0.00978	0.00976	0.00974	0.00971	0.00930	0.00923	0.00924	0.00915	0.00908	0.00906	0.00904	0.00903
Boron B	mg/L	0.024	0.024	0.024	0.024	0.024	0.023	0.023	0.023	0.023	0.023	0.023	0.023
Cadmium Cd	mg/L	0.0000396	0.0000395	0.0000394	0.0000394	0.0000378	0.0000375	0.0000376	0.0000372	0.0000369	0.0000368	0.0000367	0.0000367
Calcium Ca	mg/L	144	144	143	143	137	136	136	135	134	134	133	133
Chromium Cr	mg/L	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Cobalt Co	mg/L	0.0061	0.0061	0.0061	0.0061	0.0058	0.0058	0.0058	0.0057	0.0057	0.0057	0.0056	0.0056
Copper Cu	mg/L	0.0058	0.0058	0.0058	0.0058	0.0056	0.0055	0.0055	0.0055	0.0054	0.0054	0.0054	0.0054
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00030	0.00030	0.00030	0.00031	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029
Lithium Li	mg/L	0.0042	0.0042	0.0042	0.0044	0.0043	0.0042	0.0043	0.0042	0.0042	0.0042	0.0042	0.0042
Magnesium Mg	mg/L	7.3	7.3	7.3	7.4	7.2	7.2	7.2	7.2	7.1	7.1	7.1	7.1
Manganese Mn	mg/L	0.017	0.017	0.017	0.017	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016
Mercury Hg	mg/L	0.0000041	0.0000041	0.0000041	0.0000041	0.0000040	0.0000039	0.0000039	0.0000039	0.0000039	0.0000039	0.0000039	0.0000038
Molybdenum Mo	mg/L	0.00517	0.00516	0.00514	0.00513	0.00492	0.00488	0.00489	0.00484	0.00481	0.00479	0.00478	0.00478
Nickel Ni	mg/L	0.0053	0.0052	0.0052	0.0052	0.0050	0.0050	0.0050	0.0050	0.0049	0.0049	0.0049	0.0049
Phosphorus P	mg/L	0.172	0.172	0.171	0.171	0.164	0.163	0.163	0.162	0.160	0.160	0.160	0.159
Potassium K	mg/L	24.1	24.1	24.0	24.0	23.0	22.9	22.9	22.7	22.5	22.5	22.4	22.4
Selenium Se	mg/L	0.00044	0.00044	0.00044	0.00046	0.00045	0.00045	0.00045	0.00045	0.00044	0.00044	0.00044	0.00044
Silicon SiO2	mg/L	2.69	2.68	2.67	2.71	2.61	2.60	2.61	2.58	2.57	2.56	2.55	2.55
Silver Ag	mg/L	0.0001072	0.0001070	0.0001067	0.0001111	0.0001086	0.0001077	0.0001079	0.0001068	0.0001061	0.0001058	0.0001056	0.0001054
Sodium Na	mg/L	33	33	33	34	33	33	33	33	32	32	32	32
Strontium Sr	mg/L	0.061	0.060	0.060	0.061	0.059	0.059	0.059	0.059	0.058	0.058	0.058	0.058
Tellurium Te	mg/L	0.035	0.035	0.035	0.037	0.036	0.036	0.037	0.037	0.036	0.036	0.036	0.036
Thallium Tl	mg/L	0.000038	0.000038	0.000038	0.000040	0.000039	0.000038	0.000039	0.000038	0.000038	0.000038	0.000038	0.000038
Thorium Th	mg/L	0.000025	0.000025	0.000025	0.000025	0.000024	0.000024	0.000024	0.000024	0.000024	0.000023	0.000023	0.000023
Tin Sn	mg/L	0.00162	0.00161	0.00161	0.00161	0.00155	0.00154	0.00154	0.00153	0.00152	0.00151	0.00151	0.00151
Titanium Ti	mg/L	0.0048	0.0048	0.0048	0.0051	0.0050	0.0050	0.0050	0.0050	0.0050	0.0049	0.0049	0.0049
Uranium U	mg/L	0.000057	0.000057	0.000057	0.000059	0.000058	0.000057	0.000058	0.000057	0.000057	0.000056	0.000056	0.000056
Vanadium V	mg/L	0.0025	0.0025	0.0025	0.0025	0.0024	0.0024	0.0024	0.0023	0.0023	0.0023	0.0023	0.0023
Zinc Zn	mg/L	0.0143	0.0143	0.0142	0.0142	0.0137	0.0136	0.0137	0.0135	0.0134	0.0134	0.0134	0.0134
Zirconium Zr	mg/L	0.0040	0.0040	0.0039	0.0042	0.0041	0.0041	0.0042	0.0041	0.0041	0.0041	0.0041	0.0041

Table H-1-A-2
Scenario 1

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter													
TDS	mg/L	418	418	417	472	495	555	607	652	647	647	647	647
TSS	mg/L	2.7	2.7	2.7	2.9	2.8	2.9	3.0	2.9	2.9	2.9	2.9	2.9
Free CN	mg/L	0.00346	0.00345	0.00344	0.00343	0.00322	0.00328	0.00328	0.00325	0.00323	0.00323	0.00323	0.00323
Total CN	mg/L	0.035	0.035	0.035	0.035	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033
WAD CN	mg/L	0.0046	0.0046	0.0046	0.0046	0.0043	0.0044	0.0044	0.0043	0.0043	0.0043	0.0043	0.0043
CNO	mg/L	3.80	3.80	3.79	3.78	3.54	3.60	3.61	3.57	3.55	3.55	3.55	3.55
SCN	mg/L	0.052	0.052	0.052	0.052	0.048	0.049	0.049	0.049	0.048	0.048	0.048	0.048
Sulphate	mg/L	52.3	52.2	52.1	52.0	48.9	49.7	49.8	49.3	49.0	49.0	49.0	49.0
Chloride	mg/L	281	280	280	314	326	363	395	422	420	420	420	420
Total Ammonia	mg/L	0.701	0.699	0.698	0.696	0.653	0.664	0.666	0.659	0.655	0.655	0.655	0.655
Nitrate	mg/L	3.90	3.90	3.89	3.88	3.64	3.70	3.71	3.67	3.64	3.64	3.64	3.64
Nitrite	mg/L	0.505	0.504	0.503	0.502	0.471	0.479	0.479	0.475	0.472	0.472	0.472	0.472
Alkalinity	mg/L	41	41	41	42	40	40	41	40	40	40	40	40
OrthoPhosphate-P	mg/L	0.1028	0.1026	0.1024	0.1022	0.0960	0.0976	0.0978	0.0968	0.0961	0.0961	0.0961	0.0961
Phosphate-P	mg/L	0.1067	0.1065	0.1062	0.1069	0.1006	0.1024	0.1027	0.1017	0.1010	0.1010	0.1010	0.1010
Org. Carbon	mg/L	4.4	4.4	4.4	4.6	4.5	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Hardness CaCO3	mg/L	73	73	73	74	70	71	72	71	71	71	71	71
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Antimony Sb	mg/L	0.0095	0.0094	0.0094	0.0094	0.0088	0.0090	0.0090	0.0089	0.0088	0.0088	0.0088	0.0088
Arsenic As	mg/L	0.0017	0.0017	0.0017	0.0018	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017
Barium Ba	mg/L	0.0065	0.0065	0.0065	0.0066	0.0062	0.0063	0.0063	0.0063	0.0062	0.0062	0.0062	0.0062
Beryllium Be	mg/L	0.00045	0.00045	0.00044	0.00045	0.00043	0.00044	0.00044	0.00043	0.00043	0.00043	0.00043	0.00043
Bismuth Bi	mg/L	0.00901	0.00900	0.00898	0.00896	0.00840	0.00854	0.00856	0.00847	0.00842	0.00842	0.00842	0.00842
Boron B	mg/L	0.023	0.023	0.023	0.024	0.023	0.024	0.024	0.024	0.024	0.024	0.024	0.024
Cadmium Cd	mg/L	0.0000366	0.0000366	0.0000365	0.0000367	0.0000346	0.0000353	0.0000354	0.0000351	0.0000348	0.0000348	0.0000348	0.0000348
Calcium Ca	mg/L	133	133	132	135	130	135	139	140	139	139	139	139
Chromium Cr	mg/L	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Cobalt Co	mg/L	0.0056	0.0056	0.0056	0.0056	0.0053	0.0053	0.0054	0.0053	0.0053	0.0053	0.0053	0.0053
Copper Cu	mg/L	0.0054	0.0054	0.0054	0.0054	0.0051	0.0052	0.0052	0.0052	0.0051	0.0051	0.0051	0.0051
Iron Fe	mg/L	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Lead Pb	mg/L	0.00028	0.00028	0.00028	0.00029	0.00027	0.00028	0.00028	0.00027	0.00027	0.00027	0.00027	0.00027
Lithium Li	mg/L	0.0042	0.0042	0.0042	0.0044	0.0042	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043
Magnesium Mg	mg/L	7.1	7.1	7.0	7.3	7.0	7.1	7.2	7.1	7.1	7.1	7.1	7.1
Manganese Mn	mg/L	0.016	0.016	0.016	0.016	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015
Mercury Hg	mg/L	0.0000038	0.0000038	0.0000038	0.0000044	0.0000044	0.0000045	0.0000047	0.0000046	0.0000046	0.0000046	0.0000046	0.0000046
Molybdenum Mo	mg/L	0.00477	0.00476	0.00475	0.00475	0.00446	0.00454	0.00455	0.00451	0.00448	0.00448	0.00448	0.00448
Nickel Ni	mg/L	0.0049	0.0049	0.0049	0.0049	0.0046	0.0047	0.0047	0.0046	0.0046	0.0046	0.0046	0.0046
Phosphorus P	mg/L	0.159	0.159	0.159	0.159	0.149	0.151	0.152	0.150	0.149	0.149	0.149	0.149
Potassium K	mg/L	22.4	22.3	22.3	22.3	21.0	21.4	21.5	21.3	21.1	21.1	21.1	21.1
Selenium Se	mg/L	0.00044	0.00044	0.00044	0.00048	0.00047	0.00049	0.00050	0.00049	0.00049	0.00049	0.00049	0.00049
Silicon SiO2	mg/L	2.55	2.54	2.54	2.59	2.45	2.50	2.51	2.49	2.48	2.48	2.48	2.48
Silver Ag	mg/L	0.0001053	0.0001051	0.0001048	0.0001091	0.0001044	0.0001062	0.0001065	0.0001054	0.0001047	0.0001047	0.0001047	0.0001047
Sodium Na	mg/L	32	32	32	51	65	84	101	117	116	116	116	116
Strontium Sr	mg/L	0.058	0.058	0.058	0.059	0.056	0.057	0.057	0.057	0.057	0.057	0.057	0.057
Tellurium Te	mg/L	0.036	0.036	0.036	0.038	0.037	0.038	0.038	0.038	0.037	0.037	0.037	0.037
Thallium Tl	mg/L	0.000038	0.000038	0.000038	0.000039	0.000037	0.000038	0.000038	0.000038	0.000038	0.000038	0.000038	0.000038
Thorium Th	mg/L	0.000023	0.000023	0.000023	0.000025	0.000025	0.000025	0.000026	0.000025	0.000025	0.000025	0.000025	0.000025
Tin Sn	mg/L	0.00150	0.00150	0.00150	0.00150	0.00141	0.00144	0.00144	0.00143	0.00142	0.00142	0.00142	0.00142
Titanium Ti	mg/L	0.0049	0.0049	0.0049	0.0055	0.0055	0.0057	0.0058	0.0058	0.0057	0.0057	0.0057	0.0057
Uranium U	mg/L	0.000056	0.000056	0.000056	0.000059	0.000057	0.000058	0.000059	0.000058	0.000058	0.000058	0.000058	0.000058
Vanadium V	mg/L	0.0023	0.0023	0.0023	0.0024	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023
Zinc Zn	mg/L	0.0133	0.0133	0.0133	0.0133	0.0125	0.0128	0.0128	0.0127	0.0127	0.0127	0.0127	0.0127
Zirconium Zr	mg/L	0.0041	0.0041	0.0040	0.0042	0.0041	0.0042	0.0042	0.0042	0.0042	0.0042	0.0042	0.0042

Table H-1-A-2
Scenario 1

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter													
TDS	mg/L	647	647	647	623	629	618	628	617	617	617	617	617
TSS	mg/L	2.9	2.9	2.9	3.0	3.1	3.1	3.2	3.1	3.1	3.1	3.1	3.1
Free CN	mg/L	0.00323	0.00323	0.00323	0.00309	0.00310	0.00305	0.00309	0.00304	0.00304	0.00304	0.00304	0.00304
Total CN	mg/L	0.033	0.033	0.033	0.031	0.032	0.031	0.031	0.031	0.031	0.031	0.031	0.031
WAD CN	mg/L	0.0043	0.0043	0.0043	0.0041	0.0041	0.0041	0.0041	0.0040	0.0040	0.0040	0.0040	0.0040
CNO	mg/L	3.55	3.55	3.55	3.39	3.41	3.35	3.40	3.34	3.34	3.34	3.34	3.34
SCN	mg/L	0.048	0.048	0.048	0.046	0.047	0.046	0.046	0.046	0.046	0.046	0.046	0.046
Sulphate	mg/L	49.0	49.0	49.0	46.9	47.3	46.4	47.0	46.3	46.3	46.3	46.3	46.3
Chloride	mg/L	420	420	420	404	409	401	407	401	401	401	401	401
Total Ammonia	mg/L	0.655	0.655	0.655	0.626	0.630	0.618	0.627	0.616	0.616	0.616	0.616	0.616
Nitrate	mg/L	3.64	3.64	3.64	3.48	3.51	3.44	3.49	3.43	3.43	3.43	3.43	3.43
Nitrite	mg/L	0.472	0.472	0.472	0.451	0.454	0.445	0.451	0.444	0.444	0.444	0.444	0.444
Alkalinity	mg/L	40	40	40	39	40	40	40	40	40	40	40	40
OrthoPhosphate-P	mg/L	0.0961	0.0961	0.0961	0.0920	0.0926	0.0909	0.0921	0.0906	0.0906	0.0906	0.0906	0.0906
Phosphate-P	mg/L	0.1010	0.1010	0.1010	0.0974	0.0983	0.0966	0.0980	0.0964	0.0964	0.0964	0.0964	0.0964
Org. Carbon	mg/L	4.6	4.6	4.6	4.6	4.8	4.7	4.8	4.8	4.8	4.8	4.8	4.8
Hardness CaCO3	mg/L	71	71	71	69	70	69	70	69	69	69	69	69
Total Metals													
Aluminum Al	mg/L	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Antimony Sb	mg/L	0.0088	0.0088	0.0088	0.0085	0.0085	0.0084	0.0085	0.0083	0.0083	0.0083	0.0083	0.0083
Arsenic As	mg/L	0.0017	0.0017	0.0017	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016
Barium Ba	mg/L	0.0062	0.0062	0.0062	0.0060	0.0061	0.0060	0.0061	0.0060	0.0060	0.0060	0.0060	0.0060
Beryllium Be	mg/L	0.00043	0.00043	0.00043	0.00042	0.00042	0.00042	0.00042	0.00042	0.00042	0.00042	0.00042	0.00042
Bismuth Bi	mg/L	0.00842	0.00842	0.00842	0.00805	0.00810	0.00795	0.00805	0.00792	0.00792	0.00792	0.00792	0.00792
Boron B	mg/L	0.024	0.024	0.024	0.024	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
Cadmium Cd	mg/L	0.0000348	0.0000348	0.0000348	0.0000336	0.0000340	0.0000334	0.0000339	0.0000334	0.0000334	0.0000334	0.0000334	0.0000334
Calcium Ca	mg/L	139	139	139	133	134	132	134	132	132	132	132	132
Chromium Cr	mg/L	0.004	0.004	0.004	0.004	0.004	0.003	0.004	0.003	0.003	0.003	0.003	0.003
Cobalt Co	mg/L	0.0053	0.0053	0.0053	0.0050	0.0051	0.0050	0.0051	0.0050	0.0050	0.0050	0.0050	0.0050
Copper Cu	mg/L	0.0051	0.0051	0.0051	0.0050	0.0050	0.0049	0.0050	0.0049	0.0049	0.0049	0.0049	0.0049
Iron Fe	mg/L	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Lead Pb	mg/L	0.00027	0.00027	0.00027	0.00026	0.00027	0.00026	0.00027	0.00026	0.00026	0.00026	0.00026	0.00026
Lithium Li	mg/L	0.0043	0.0043	0.0043	0.0043	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044
Magnesium Mg	mg/L	7.1	7.1	7.1	7.0	7.2	7.1	7.3	7.2	7.2	7.2	7.2	7.2
Manganese Mn	mg/L	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015
Mercury Hg	mg/L	0.0000046	0.0000046	0.0000046	0.0000050	0.0000053	0.0000052	0.0000054	0.0000054	0.0000054	0.0000054	0.0000054	0.0000054
Molybdenum Mo	mg/L	0.00448	0.00448	0.00448	0.00429	0.00432	0.00424	0.00430	0.00423	0.00423	0.00423	0.00423	0.00423
Nickel Ni	mg/L	0.0046	0.0046	0.0046	0.0044	0.0045	0.0044	0.0045	0.0044	0.0044	0.0044	0.0044	0.0044
Phosphorus P	mg/L	0.149	0.149	0.149	0.143	0.144	0.141	0.143	0.141	0.141	0.141	0.141	0.141
Potassium K	mg/L	21.1	21.1	21.1	20.3	20.5	20.1	20.4	20.1	20.1	20.1	20.1	20.1
Selenium Se	mg/L	0.00049	0.00049	0.00049	0.00051	0.00054	0.00053	0.00055	0.00054	0.00054	0.00054	0.00054	0.00054
Silicon SiO2	mg/L	2.48	2.48	2.48	2.42	2.46	2.42	2.46	2.43	2.43	2.43	2.43	2.43
Silver Ag	mg/L	0.0001047	0.0001047	0.0001047	0.0001045	0.0001072	0.0001053	0.0001068	0.0001050	0.0001050	0.0001050	0.0001050	0.0001050
Sodium Na	mg/L	116	116	116	113	114	112	114	113	113	113	113	113
Strontium Sr	mg/L	0.057	0.057	0.057	0.055	0.057	0.056	0.057	0.056	0.056	0.056	0.056	0.056
Tellurium Te	mg/L	0.037	0.037	0.037	0.038	0.039	0.039	0.040	0.039	0.039	0.039	0.039	0.039
Thallium Tl	mg/L	0.000038	0.000038	0.000038	0.000037	0.000038	0.000038	0.000038	0.000038	0.000038	0.000038	0.000038	0.000038
Thorium Th	mg/L	0.000025	0.000025	0.000025	0.000026	0.000027	0.000027	0.000028	0.000027	0.000027	0.000027	0.000027	0.000027
Tin Sn	mg/L	0.00142	0.00142	0.00142	0.00136	0.00138	0.00135	0.00137	0.00135	0.00135	0.00135	0.00135	0.00135
Titanium Ti	mg/L	0.0057	0.0057	0.0057	0.0061	0.0064	0.0064	0.0066	0.0065	0.0065	0.0065	0.0065	0.0065
Uranium U	mg/L	0.000058	0.000058	0.000058	0.000059	0.000060	0.000060	0.000061	0.000060	0.000060	0.000060	0.000060	0.000060
Vanadium V	mg/L	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023
Zinc Zn	mg/L	0.0127	0.0127	0.0127	0.0122	0.0123	0.0121	0.0123	0.0121	0.0121	0.0121	0.0121	0.0121
Zirconium Zr	mg/L	0.0042	0.0042	0.0042	0.0042	0.0043	0.0043	0.0044	0.0043	0.0043	0.0043	0.0043	0.0043

Table H-1-A-2
Scenario 1

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE										
Date		Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16
Parameter												
TDS	mg/L	617	617	617	595	601	590	599	593	589	589	589
TSS	mg/L	3.1	3.1	3.1	3.2	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Free CN	mg/L	0.00304	0.00304	0.00304	0.00290	0.00292	0.00286	0.00290	0.00287	0.00286	0.00286	0.00286
Total CN	mg/L	0.031	0.031	0.031	0.030	0.030	0.029	0.030	0.029	0.029	0.029	0.029
WAD CN	mg/L	0.0040	0.0040	0.0040	0.0039	0.0039	0.0038	0.0039	0.0038	0.0038	0.0038	0.0038
CNO	mg/L	3.34	3.34	3.34	3.19	3.21	3.15	3.19	3.16	3.14	3.14	3.14
SCN	mg/L	0.046	0.046	0.046	0.044	0.044	0.043	0.044	0.043	0.043	0.043	0.043
Sulphate	mg/L	46.3	46.3	46.3	44.3	44.6	43.8	44.4	44.0	43.7	43.7	43.7
Chloride	mg/L	401	401	401	386	391	384	390	386	383	383	383
Total Ammonia	mg/L	0.616	0.616	0.616	0.589	0.593	0.582	0.590	0.584	0.580	0.580	0.580
Nitrate	mg/L	3.43	3.43	3.43	3.28	3.30	3.24	3.28	3.25	3.23	3.23	3.23
Nitrite	mg/L	0.444	0.444	0.444	0.424	0.427	0.419	0.424	0.420	0.417	0.417	0.417
Alkalinity	mg/L	40	40	40	39	40	39	40	40	39	39	39
OrthoPhosphate-P	mg/L	0.0906	0.0906	0.0906	0.0867	0.0872	0.0856	0.0868	0.0859	0.0854	0.0854	0.0854
Phosphate-P	mg/L	0.0964	0.0964	0.0964	0.0930	0.0939	0.0923	0.0936	0.0927	0.0921	0.0921	0.0921
Org. Carbon	mg/L	4.8	4.8	4.8	4.8	5.0	4.9	5.0	5.0	4.9	4.9	4.9
Hardness CaCO3	mg/L	69	69	69	68	69	68	69	68	68	68	68
Total Metals												
Aluminum Al	mg/L	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Antimony Sb	mg/L	0.0083	0.0083	0.0083	0.0080	0.0080	0.0079	0.0080	0.0079	0.0079	0.0079	0.0079
Arsenic As	mg/L	0.0016	0.0016	0.0016	0.0015	0.0016	0.0015	0.0016	0.0016	0.0015	0.0015	0.0015
Barium Ba	mg/L	0.0060	0.0060	0.0060	0.0058	0.0059	0.0058	0.0059	0.0058	0.0058	0.0058	0.0058
Beryllium Be	mg/L	0.00042	0.00042	0.00042	0.00041	0.00041	0.00040	0.00041	0.00041	0.00040	0.00040	0.00040
Bismuth Bi	mg/L	0.00792	0.00792	0.00792	0.00757	0.00762	0.00748	0.00758	0.00750	0.00745	0.00745	0.00745
Boron B	mg/L	0.025	0.025	0.025	0.025	0.026	0.026	0.027	0.026	0.026	0.026	0.026
Cadmium Cd	mg/L	0.0000334	0.0000334	0.0000334	0.0000323	0.0000326	0.0000321	0.0000326	0.0000323	0.0000320	0.0000320	0.0000320
Calcium Ca	mg/L	132	132	132	126	127	125	126	125	124	124	124
Chromium Cr	mg/L	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Cobalt Co	mg/L	0.0050	0.0050	0.0050	0.0048	0.0048	0.0047	0.0048	0.0047	0.0047	0.0047	0.0047
Copper Cu	mg/L	0.0049	0.0049	0.0049	0.0048	0.0048	0.0048	0.0048	0.0048	0.0048	0.0048	0.0048
Iron Fe	mg/L	0.07	0.07	0.07	0.08	0.08	0.08	0.09	0.08	0.08	0.08	0.08
Lead Pb	mg/L	0.00026	0.00026	0.00026	0.00025	0.00026	0.00025	0.00026	0.00025	0.00025	0.00025	0.00025
Lithium Li	mg/L	0.0044	0.0044	0.0044	0.0044	0.0045	0.0045	0.0046	0.0045	0.0045	0.0045	0.0045
Magnesium Mg	mg/L	7.2	7.2	7.2	7.1	7.3	7.2	7.3	7.3	7.2	7.2	7.2
Manganese Mn	mg/L	0.015	0.015	0.015	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014
Mercury Hg	mg/L	0.0000054	0.0000054	0.0000054	0.0000057	0.0000060	0.0000059	0.0000061	0.0000061	0.0000061	0.0000061	0.0000061
Molybdenum Mo	mg/L	0.00423	0.00423	0.00423	0.00406	0.00409	0.00401	0.00407	0.00403	0.00400	0.00400	0.00400
Nickel Ni	mg/L	0.0044	0.0044	0.0044	0.0042	0.0043	0.0042	0.0042	0.0042	0.0042	0.0042	0.0042
Phosphorus P	mg/L	0.141	0.141	0.141	0.135	0.136	0.133	0.135	0.134	0.133	0.133	0.133
Potassium K	mg/L	20.1	20.1	20.1	19.4	19.5	19.2	19.5	19.3	19.2	19.2	19.2
Selenium Se	mg/L	0.00054	0.00054	0.00054	0.00056	0.00058	0.00058	0.00059	0.00059	0.00059	0.00059	0.00059
Silicon SiO2	mg/L	2.43	2.43	2.43	2.37	2.41	2.37	2.42	2.39	2.38	2.38	2.38
Silver Ag	mg/L	0.0001050	0.0001050	0.0001050	0.0001048	0.0001075	0.0001055	0.0001070	0.0001060	0.0001053	0.0001053	0.0001053
Sodium Na	mg/L	113	113	113	109	111	109	111	110	109	109	109
Strontium Sr	mg/L	0.056	0.056	0.056	0.055	0.056	0.055	0.056	0.056	0.055	0.055	0.055
Tellurium Te	mg/L	0.039	0.039	0.039	0.039	0.041	0.040	0.041	0.041	0.040	0.040	0.040
Thallium Tl	mg/L	0.000038	0.000038	0.000038	0.000037	0.000038	0.000038	0.000039	0.000038	0.000038	0.000038	0.000038
Thorium Th	mg/L	0.000027	0.000027	0.000027	0.000028	0.000029	0.000029	0.000030	0.000029	0.000029	0.000029	0.000029
Tin Sn	mg/L	0.00135	0.00135	0.00135	0.00130	0.00131	0.00129	0.00131	0.00130	0.00129	0.00129	0.00129
Titanium Ti	mg/L	0.0065	0.0065	0.0065	0.0069	0.0072	0.0072	0.0074	0.0073	0.0073	0.0073	0.0073
Uranium U	mg/L	0.000060	0.000060	0.000060	0.000060	0.000062	0.000061	0.000062	0.000062	0.000062	0.000062	0.000062
Vanadium V	mg/L	0.0023	0.0023	0.0023	0.0022	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023
Zinc Zn	mg/L	0.0121	0.0121	0.0121	0.0116	0.0117	0.0115	0.0118	0.0117	0.0116	0.0116	0.0116
Zirconium Zr	mg/L	0.0043	0.0043	0.0043	0.0043	0.0044	0.0044	0.0045	0.0045	0.0044	0.0044	0.0044

Table H 1-A-3
Scenario 1

Loadings to Tail Lake (kg/month)												
Date	Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter												
TDS	81148	78530	81148	117442	100848	86227	86140	83147	78530	81148	81148	73295
TSS	183	177	183	1239	676	336	368	233	177	183	183	166
Free CN	1.10	1.06	1.10	1.06	1.10	1.10	1.06	1.10	1.06	1.10	1.10	0.99
Total CN	11	10	11	11	11	11	10	11	10	11	11	10
WAD CN	1.47	1.42	1.47	1.42	1.47	1.47	1.42	1.47	1.42	1.47	1.47	1.32
CNO	1210	1171	1210	1171	1210	1210	1171	1210	1171	1210	1210	1093
SCN	16	16	16	16	16	16	16	16	16	16	16	15
Sulphate	14302	13840	14302	18322	17066	15395	15291	14792	13840	14302	14302	12918
Chloride	49110	47526	49110	82360	70919	57259	58093	52595	47526	49110	49110	44357
Total Ammonia	149	145	149	288	238	187	194	166	145	149	149	135
Nitrate	758	733	758	1855	1453	1051	1108	888	733	758	758	684
Nitrite	116	112	116	139	132	123	121	119	112	116	116	105
Alkalinity	6928	6704	6928	15548	12017	8299	8290	7344	6704	6928	6928	6257
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	24	22	22	21	21	21	21	21	19
Org. Carbon				2122.46	1149.16	304.79	317.09	83.28				
Hardness CaCO3	14992	14508	14992	26182	22051	16871	16918	15625	14508	14992	14992	13541
Total Metals												
Aluminum Al	4.47	4.33	4.47	19.31	12.05	9.18	8.79	5.91	4.33	4.47	4.47	4.04
Antimony Sb	1.32	1.28	1.32	4.67	3.44	2.22	2.44	1.72	1.28	1.32	1.32	1.19
Arsenic As	0.39	0.38	0.39	0.69	0.59	0.47	0.47	0.43	0.38	0.39	0.39	0.36
Barium Ba	1.56	1.51	1.56	2.29	2.00	1.75	1.72	1.62	1.51	1.56	1.56	1.41
Beryllium Be	0.05	0.05	0.05	0.23	0.15	0.08	0.09	0.06	0.05	0.05	0.05	0.04
Bismuth Bi	1.23	1.19	1.23	4.55	3.31	2.10	2.31	1.62	1.19	1.23	1.23	1.11
Boron B	2.80	2.71	2.80	10.30	7.34	4.48	4.70	3.42	2.71	2.80	2.80	2.53
Cadmium Cd	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Calcium Ca	40484	39178	40484	42156	42150	41148	39979	40728	39178	40484	40484	36566
Chromium Cr	1.02	0.99	1.02	1.32	1.26	1.11	1.06	1.04	0.99	1.02	1.02	0.92
Cobalt Co	1.67	1.62	1.67	1.85	1.81	1.73	1.69	1.70	1.62	1.67	1.67	1.51
Copper Cu	1.46	1.41	1.46	1.84	1.69	1.52	1.49	1.48	1.41	1.46	1.46	1.32
Iron Fe	4.63	4.48	4.63	21.53	11.57	9.20	9.28	5.96	4.48	4.63	4.63	4.18
Lead Pb	0.05	0.05	0.05	0.13	0.10	0.07	0.07	0.06	0.05	0.05	0.05	0.04
Lithium Li	0.46	0.45	0.46	1.84	1.14	0.69	0.73	0.54	0.45	0.46	0.46	0.42
Magnesium Mg	1082	1047	1082	2866	2073	1453	1457	1200	1047	1082	1082	977
Manganese Mn	4.56	4.41	4.56	5.17	4.97	4.80	4.75	4.66	4.41	4.56	4.56	4.12
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	1.48	1.43	1.48	1.50	1.52	1.49	1.45	1.48	1.43	1.48	1.48	1.34
Nickel Ni	1.26	1.22	1.26	1.77	1.58	1.38	1.37	1.31	1.22	1.26	1.26	1.14
Phosphorus P	33	32	33	45	40	36	36	35	32	33	33	30
Potassium K	6696	6480	6696	7119	7030	6791	6626	6737	6480	6696	6696	6048
Selenium Se	0.04	0.04	0.04	0.21	0.12	0.06	0.07	0.05	0.04	0.04	0.04	0.03
Silicon SiO2	556	538	556	963	770	630	631	583	538	556	556	502
Silver Ag	0.01	0.01	0.01	0.06	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sodium Na	6353	6148	6353	11746	9467	7284	7317	6662	6148	6353	6353	5739
Strontium Sr	12	12	12	21	18	14	14	13	12	12	12	11
Tellurium Te	0.02	0.02	0.02	17.74	8.25	2.57	3.20	0.86	0.02	0.02	0.02	0.02
Thallium Tl	0.00	0.00	0.00	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.02	0.01	0.00	0.01	0.00				
Tin Sn	0.18	0.18	0.18	0.74	0.56	0.34	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.10	0.09	0.10	2.42	1.21	0.45	0.54	0.22	0.09	0.10	0.10	0.09
Uranium U	0.00	0.00	0.00	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.36	0.35	0.36	1.09	0.79	0.52	0.54	0.43	0.35	0.36	0.36	0.33
Zinc Zn	3.5	3.4	3.5	4.4	4.1	3.8	4.2	3.7	3.4	3.5	3.5	3.2
Zirconium Zr				2.10	1.03	0.34	0.43	0.12				

Table H 1-A-3
Scenario 1

Loadings to Tail Lake (kg/month)												
Date	Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter												
TDS	81148	78530	81148	115712	100109	86048	85877	83080	78530	81148	81148	73295
TSS	183	177	183	1191	657	330	361	232	177	183	183	166
Free CN	1.10	1.06	1.10	1.06	1.10	1.10	1.06	1.10	1.06	1.10	1.10	0.99
Total CN	11	10	11	11	11	11	10	11	10	11	11	10
WAD CN	1.47	1.42	1.47	1.42	1.47	1.47	1.42	1.47	1.42	1.47	1.47	1.32
CNO	1210	1171	1210	1171	1210	1210	1171	1210	1171	1210	1210	1093
SCN	16	16	16	16	16	16	16	16	16	16	16	15
Sulphate	14302	13840	14302	18291	17050	15391	15284	14790	13840	14302	14302	12918
Chloride	49110	47526	49110	81904	70673	57198	58011	52574	47526	49110	49110	44357
Total Ammonia	149	145	149	288	238	187	194	166	145	149	149	135
Nitrate	758	733	758	1855	1453	1051	1108	888	733	758	758	684
Nitrite	116	112	116	139	132	123	121	119	112	116	116	105
Alkalinity	6928	6704	6928	15155	11826	8251	8235	7330	6704	6928	6928	6257
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	24	22	22	21	21	21	21	21	19
Org. Carbon				2028.11	1106.10	294.04	306.11	80.51				
Hardness CaCO3	14992	14508	14992	25663	21786	16805	16835	15604	14508	14992	14992	13541
Total Metals												
Aluminum Al	4.47	4.33	4.47	19.05	11.98	9.10	8.74	5.89	4.33	4.47	4.47	4.04
Antimony Sb	1.32	1.28	1.32	4.67	3.44	2.22	2.44	1.72	1.28	1.32	1.32	1.19
Arsenic As	0.39	0.38	0.39	0.69	0.59	0.47	0.47	0.43	0.38	0.39	0.39	0.36
Barium Ba	1.56	1.51	1.56	2.26	1.98	1.75	1.72	1.62	1.51	1.56	1.56	1.41
Beryllium Be	0.05	0.05	0.05	0.23	0.15	0.08	0.09	0.06	0.05	0.05	0.05	0.04
Bismuth Bi	1.23	1.19	1.23	4.55	3.31	2.10	2.31	1.62	1.19	1.23	1.23	1.11
Boron B	2.80	2.71	2.80	10.12	7.25	4.45	4.67	3.41	2.71	2.80	2.80	2.53
Cadmium Cd	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Calcium Ca	40484	39178	40484	42075	42114	41135	39965	40724	39178	40484	40484	36566
Chromium Cr	1.02	0.99	1.02	1.31	1.26	1.11	1.06	1.04	0.99	1.02	1.02	0.92
Cobalt Co	1.67	1.62	1.67	1.85	1.81	1.73	1.69	1.70	1.62	1.67	1.67	1.51
Copper Cu	1.46	1.41	1.46	1.83	1.68	1.52	1.49	1.48	1.41	1.46	1.46	1.32
Iron Fe	4.63	4.48	4.63	20.87	11.36	9.06	9.14	5.92	4.48	4.63	4.63	4.18
Lead Pb	0.05	0.05	0.05	0.13	0.10	0.07	0.07	0.06	0.05	0.05	0.05	0.04
Lithium Li	0.46	0.45	0.46	1.79	1.12	0.68	0.72	0.54	0.45	0.46	0.46	0.42
Magnesium Mg	1082	1047	1082	2802	2045	1443	1447	1198	1047	1082	1082	977
Manganese Mn	4.56	4.41	4.56	5.16	4.96	4.80	4.74	4.66	4.41	4.56	4.56	4.12
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	1.48	1.43	1.48	1.50	1.52	1.49	1.45	1.48	1.43	1.48	1.48	1.34
Nickel Ni	1.26	1.22	1.26	1.76	1.57	1.38	1.36	1.31	1.22	1.26	1.26	1.14
Phosphorus P	33	32	33	45	40	36	36	35	32	33	33	30
Potassium K	6696	6480	6696	7094	7019	6789	6622	6736	6480	6696	6696	6048
Selenium Se	0.04	0.04	0.04	0.20	0.12	0.06	0.07	0.05	0.04	0.04	0.04	0.03
Silicon SiO2	556	538	556	949	764	628	629	583	538	556	556	502
Silver Ag	0.01	0.01	0.01	0.06	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sodium Na	6353	6148	6353	11499	9351	7252	7277	6652	6148	6353	6353	5739
Strontium Sr	12	12	12	20	17	14	14	13	12	12	12	11
Tellurium Te	0.02	0.02	0.02	16.95	7.94	2.48	3.09	0.83	0.02	0.02	0.02	0.02
Thallium Tl	0.00	0.00	0.00	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.02	0.01	0.00	0.01	0.00				
Tin Sn	0.18	0.18	0.18	0.74	0.56	0.33	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.10	0.09	0.10	2.32	1.17	0.44	0.53	0.22	0.09	0.10	0.10	0.09
Uranium U	0.00	0.00	0.00	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.36	0.35	0.36	1.08	0.79	0.52	0.54	0.43	0.35	0.36	0.36	0.33
Zinc Zn	3.5	3.4	3.5	4.4	4.1	3.8	4.1	3.7	3.4	3.5	3.5	3.2
Zirconium Zr				2.02	1.00	0.33	0.42	0.12				

Table H 1-A-3
Scenario 1

Loadings to Tail Lake (kg/month)												
Date	Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter												
TDS	50662	49028	50662	85311	69216	55462	56228	52557	49028	50662	50662	45759
TSS				990	464	144	180	47				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate	1289	1247	1289	5581	3967	2350	2654	1765	1247	1289	1289	1164
Chloride	49110	47526	49110	81667	70537	57164	57966	52563	47526	49110	49110	44357
Total Ammonia	25	24	25	153	104	58	68	40	24	25	25	22
Nitrate	29	28	29	1036	654	292	365	147	28	29	29	26
Nitrite	64	62	64	86	79	71	70	67	62	64	64	58
Alkalinity				8246	4793	1296	1500	395				
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	24	22	22	21	21	21	21	21	19
Org. Carbon				1979.12	1082.35	288.03	300.01	78.97				
Hardness CaCO3				10885	6649	1776	2280	600				
Total Metals												
Aluminum Al	0.81	0.78	0.81	12.42	6.44	4.62	4.18	1.88	0.78	0.81	0.81	0.73
Antimony Sb	1.21	1.17	1.21	4.55	3.32	2.11	2.33	1.61	1.17	1.21	1.21	1.09
Arsenic As	0.03	0.03	0.03	0.27	0.18	0.08	0.10	0.05	0.03	0.03	0.03	0.02
Barium Ba	0.06	0.06	0.06	0.79	0.47	0.24	0.26	0.12	0.06	0.06	0.06	0.05
Beryllium Be	0.03	0.03	0.03	0.20	0.12	0.06	0.06	0.04	0.03	0.03	0.03	0.03
Bismuth Bi	1.21	1.17	1.21	4.52	3.28	2.08	2.29	1.60	1.17	1.21	1.21	1.09
Boron B	0.60	0.58	0.60	7.20	4.57	2.06	2.30	1.13	0.58	0.60	0.60	0.55
Cadmium Cd	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Calcium Ca	263	254	263	2936	1766	861	975	480	254	263	263	237
Chromium Cr	0.07	0.06	0.07	0.37	0.30	0.16	0.13	0.09	0.06	0.07	0.07	0.06
Cobalt Co	0.06	0.06	0.06	0.28	0.19	0.11	0.13	0.08	0.06	0.06	0.06	0.05
Copper Cu	0.03	0.03	0.03	0.42	0.24	0.09	0.10	0.05	0.03	0.03	0.03	0.03
Iron Fe	0.23	0.23	0.23	15.58	6.42	4.40	4.57	1.42	0.23	0.23	0.23	0.21
Lead Pb	0.01	0.01	0.01	0.08	0.05	0.03	0.03	0.02	0.01	0.01	0.01	0.01
Lithium Li	0.06	0.06	0.06	1.36	0.70	0.27	0.32	0.14	0.06	0.06	0.06	0.05
Magnesium Mg	121	117	121	1822	1058	473	507	234	117	121	121	110
Manganese Mn	0.16	0.15	0.16	0.88	0.55	0.39	0.47	0.26	0.15	0.16	0.16	0.14
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	0.01	0.01	0.01	0.08	0.05	0.02	0.03	0.02	0.01	0.01	0.01	0.01
Nickel Ni	0.12	0.12	0.12	0.64	0.42	0.24	0.26	0.17	0.12	0.12	0.12	0.11
Phosphorus P	23	22	23	33	29	25	25	24	22	23	23	21
Potassium K	25	24	25	621	340	115	162	64	24	25	25	23
Selenium Se	0.00	0.00	0.00	0.15	0.07	0.02	0.03	0.01	0.00	0.00	0.00	0.00
Silicon SiO2	10	9	10	380	195	72	88	33	9	10	10	9
Silver Ag	0.00	0.00	0.00	0.05	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Sodium Na	12	12	12	5230	2943	891	1117	304	12	12	12	11
Strontium Sr	0	0	0	9	5	2	2	1	0	0	0	0
Tellurium Te				16.51	7.74	2.41	3.01	0.79				
Thallium Tl	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn	0.18	0.18	0.18	0.73	0.55	0.33	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.06	0.06	0.06	2.22	1.10	0.40	0.48	0.18	0.06	0.06	0.06	0.05
Uranium U	0.00	0.00	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.18	0.18	0.18	0.87	0.59	0.33	0.36	0.24	0.18	0.18	0.18	0.16
Zinc Zn	0.2	0.2	0.2	1.1	0.8	0.5	0.9	0.4	0.2	0.2	0.2	0.2
Zirconium Zr				1.85	0.90	0.29	0.37	0.10				

Table H 1-A-3
Scenario 1

Loadings to Tail Lake (kg/month)												
Date	Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter												
TDS				35824	18335	4745	7119	1874				
TSS				977	458	142	178	47				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				788	479	136	222	63				
Chloride				9445	6112	1613	2195	578				
Total Ammonia				61	37	16	21	7				
Nitrate				470	291	122	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				8142	4737	1281	1483	391				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1954.05	1069.54	284.73	296.63	78.10				
Hardness CaCO3				10747	6570	1756	2254	594				
Total Metals												
Aluminum Al				9.66	4.43	3.29	2.74	0.85				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.16	0.10	0.04	0.04	0.01				
Barium Ba				0.55	0.30	0.13	0.14	0.04				
Beryllium Be				0.08	0.04	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				4.91	2.91	1.01	1.15	0.33				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				1938	1045	406	475	132				
Chromium Cr				0.14	0.13	0.05	0.01	0.00				
Cobalt Co				0.05	0.03	0.01	0.01	0.00				
Copper Cu				0.32	0.17	0.04	0.05	0.01				
Iron Fe				14.68	5.82	3.99	4.14	1.12				
Lead Pb				0.04	0.02	0.01	0.01	0.00				
Lithium Li				1.12	0.53	0.17	0.21	0.05				
Magnesium Mg				1354	722	261	275	73				
Manganese Mn				0.28	0.12	0.12	0.17	0.05				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.19	0.10	0.03	0.03	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				521	268	71	113	30				
Selenium Se				0.15	0.07	0.02	0.03	0.01				
Silicon SiO2				341	167	55	69	20				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				5119	2876	861	1082	285				
Strontium Sr				7	4	1	2	0				
Tellurium Te				16.30	7.65	2.38	2.97	0.78				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.05	0.06	0.02	0.02	0.01				
Titanium Ti				1.97	0.93	0.29	0.36	0.10				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.20	0.10	0.02	0.01	0.00				
Zinc Zn				0.4	0.2	0.1	0.5	0.1				
Zirconium Zr				1.83	0.89	0.29	0.36	0.10				

Table H 1-A-3
Scenario 1

Loadings to Tail Lake (kg/month)												
Date	Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter												
TDS				35462	18155	4699	7050	1856				
TSS				967	454	141	176	46				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				782	475	135	220	62				
Chloride				9349	6052	1598	2174	572				
Total Ammonia				61	37	16	21	7				
Nitrate				470	291	122	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				8060	4690	1269	1469	387				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1934.32	1059.04	281.96	293.75	77.35				
Hardness CaCO3				10639	6506	1739	2232	588				
Total Metals												
Aluminum Al				9.61	4.41	3.27	2.73	0.84				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.16	0.10	0.04	0.04	0.01				
Barium Ba				0.55	0.30	0.13	0.14	0.04				
Beryllium Be				0.08	0.04	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				4.87	2.89	1.00	1.14	0.33				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				1921	1036	403	471	131				
Chromium Cr				0.14	0.12	0.05	0.01	0.00				
Cobalt Co				0.05	0.03	0.01	0.01	0.00				
Copper Cu				0.32	0.17	0.04	0.05	0.01				
Iron Fe				14.54	5.76	3.95	4.10	1.11				
Lead Pb				0.04	0.02	0.01	0.01	0.00				
Lithium Li				1.11	0.52	0.16	0.20	0.05				
Magnesium Mg				1341	715	259	272	72				
Manganese Mn				0.28	0.12	0.11	0.17	0.05				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.19	0.09	0.03	0.03	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				516	266	70	112	30				
Selenium Se				0.15	0.07	0.02	0.03	0.01				
Silicon SiO2				338	166	55	69	19				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				5068	2848	852	1071	282				
Strontium Sr				7	4	1	2	0				
Tellurium Te				16.14	7.58	2.35	2.94	0.78				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.05	0.06	0.02	0.02	0.01				
Titanium Ti				1.95	0.92	0.29	0.36	0.10				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.19	0.10	0.02	0.01	0.00				
Zinc Zn				0.4	0.2	0.1	0.5	0.1				
Zirconium Zr				1.81	0.88	0.29	0.36	0.10				

Table H 1-A-3
Scenario 1

Loadings to Tail Lake (kg/month)												
Date	Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter												
TDS				35119	17981	4654	6983	1839				
TSS				958	450	140	175	46				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				776	472	134	218	62				
Chloride				9259	5994	1583	2153	567				
Total Ammonia				61	37	16	21	7				
Nitrate				469	291	122	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				7982	4645	1257	1455	383				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1915.59	1048.87	279.26	290.95	76.61				
Hardness CaCO3				10536	6443	1722	2211	582				
Total Metals												
Aluminum Al				9.55	4.40	3.25	2.72	0.84				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.16	0.10	0.04	0.04	0.01				
Barium Ba				0.54	0.30	0.13	0.14	0.04				
Beryllium Be				0.08	0.04	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				4.83	2.87	1.00	1.13	0.33				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				1905	1028	399	468	130				
Chromium Cr				0.14	0.12	0.04	0.01	0.00				
Cobalt Co				0.05	0.03	0.01	0.01	0.00				
Copper Cu				0.31	0.17	0.04	0.05	0.01				
Iron Fe				14.41	5.71	3.92	4.06	1.10				
Lead Pb				0.04	0.02	0.01	0.01	0.00				
Lithium Li				1.10	0.52	0.16	0.20	0.05				
Magnesium Mg				1328	708	257	270	72				
Manganese Mn				0.28	0.12	0.11	0.17	0.04				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.19	0.09	0.03	0.03	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				511	263	70	111	29				
Selenium Se				0.15	0.07	0.02	0.03	0.01				
Silicon SiO2				335	164	54	68	19				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				5019	2821	844	1061	280				
Strontium Sr				7	4	1	2	0				
Tellurium Te				15.98	7.50	2.33	2.92	0.77				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.05	0.06	0.02	0.02	0.01				
Titanium Ti				1.94	0.91	0.28	0.36	0.09				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.19	0.10	0.02	0.01	0.00				
Zinc Zn				0.4	0.2	0.1	0.5	0.1				
Zirconium Zr				1.79	0.87	0.28	0.36	0.10				

Table H 1-A-3
Scenario 1

Loadings to Tail Lake (kg/month)												
Date	Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter												
TDS				34781	17807	4610	6916	1821				
TSS				949	445	138	173	46				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				623	377	94	168	44				
Chloride				9170	5936	1567	2132	561				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				7905	4600	1245	1441	379				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1897.16	1038.72	276.57	288.16	75.87				
Hardness CaCO3				10434	6381	1706	2190	577				
Total Metals												
Aluminum Al				5.22	1.72	2.11	1.27	0.34				
Antimony Sb				0.04	0.04	0.03	0.04	0.01				
Arsenic As				0.06	0.04	0.01	0.01	0.00				
Barium Ba				0.52	0.29	0.13	0.13	0.04				
Beryllium Be				0.06	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.00	0.00	0.00	0.00				
Boron B				3.79	2.23	0.73	0.79	0.21				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				1638	864	331	380	100				
Chromium Cr				0.12	0.11	0.04	0.01	0.00				
Cobalt Co				0.03	0.01	0.00	0.01	0.00				
Copper Cu				0.28	0.15	0.03	0.04	0.01				
Iron Fe				13.28	5.05	3.62	3.69	0.97				
Lead Pb				0.02	0.01	0.00	0.00	0.00				
Lithium Li				1.07	0.50	0.16	0.19	0.05				
Magnesium Mg				1290	686	248	259	68				
Manganese Mn				0.25	0.10	0.11	0.16	0.04				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.16	0.08	0.02	0.02	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				500	257	67	108	28				
Selenium Se				0.13	0.06	0.02	0.02	0.00				
Silicon SiO2				285	134	41	52	14				
Silver Ag				0.03	0.01	0.00	0.00	0.00				
Sodium Na				4964	2790	834	1049	276				
Strontium Sr				7	4	1	2	0				
Tellurium Te				15.81	7.42	2.30	2.88	0.76				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th												
Tin Sn				0.03	0.04	0.01	0.02	0.00				
Titanium Ti				1.90	0.89	0.28	0.35	0.09				
Uranium U				0.02	0.01	0.00	0.00	0.00				
Vanadium V				0.15	0.07	0.01	0.00	0.00				
Zinc Zn				0.3	0.1	0.1	0.5	0.1				
Zirconium Zr				1.58	0.74	0.23	0.29	0.08				

Table H 1-A-3
Scenario 1

Loadings to Tail Lake (kg/month)												
Date	Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter												
TDS				412653	395842	382791	385082	380021				
TSS				1523	714	223	278	73				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				617	373	94	167	44				
Chloride				255283	243688	234261	235402	231711				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				7827	4554	1236	1431	377				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				7	3	1	1	0				
Org. Carbon				1878.57	1028.37	274.71	286.23	75.36				
Hardness CaCO3				10332	6317	1694	2175	573				
Total Metals												
Aluminum Al				55.74	25.43	9.49	10.51	2.77				
Antimony Sb				0.05	0.04	0.03	0.04	0.01				
Arsenic As				0.15	0.08	0.02	0.03	0.01				
Barium Ba				0.52	0.28	0.12	0.13	0.03				
Beryllium Be				0.06	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.01	0.00	0.00	0.00				
Boron B				10.07	5.16	1.65	1.94	0.51				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				24376	23355	22673	22740	22397				
Chromium Cr				0.22	0.16	0.05	0.02	0.01				
Cobalt Co				0.06	0.03	0.01	0.01	0.00				
Copper Cu				0.44	0.22	0.06	0.07	0.02				
Iron Fe				62.31	28.06	10.79	12.66	3.33				
Lead Pb				0.03	0.01	0.00	0.00	0.00				
Lithium Li				1.52	0.71	0.22	0.28	0.07				
Magnesium Mg				1949	994	344	380	100				
Manganese Mn				1.42	0.65	0.28	0.37	0.10				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.10	0.05	0.01	0.02	0.00				
Nickel Ni				0.21	0.10	0.03	0.03	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				1021	501	144	203	54				
Selenium Se				0.33	0.16	0.05	0.06	0.01				
Silicon SiO2				405	190	59	74	20				
Silver Ag				0.03	0.02	0.00	0.00	0.00				
Sodium Na				139847	132711	127746	128303	126271				
Strontium Sr				10	6	2	2	1				
Tellurium Te				15.66	7.35	2.29	2.86	0.75				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.04	0.05	0.01	0.02	0.00				
Titanium Ti				4.75	2.23	0.69	0.87	0.23				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.57	0.27	0.07	0.08	0.02				
Zinc Zn				0.5	0.2	0.1	0.5	0.1				
Zirconium Zr				1.58	0.74	0.23	0.29	0.08				

Table H 1-A-3
Scenario 1

Loadings to Tail Lake (kg/month)												
Date	Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter												
TDS				34270	17648	4569	6865	1807				
TSS				1515	715	222	278	73				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				614	374	94	166	44				
Chloride				24767	13309	3860	5006	1318				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				7789	4559	1233	1430	377				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				7	3	1	1	0				
Org. Carbon				1869.25	1029.46	274.11	286.05	75.31				
Hardness CaCO3				10281	6324	1690	2174	572				
Total Metals												
Aluminum Al				55.46	25.46	9.47	10.51	2.77				
Antimony Sb				0.05	0.04	0.03	0.04	0.01				
Arsenic As				0.15	0.08	0.02	0.03	0.01				
Barium Ba				0.52	0.28	0.12	0.13	0.03				
Beryllium Be				0.06	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.01	0.00	0.00	0.00				
Boron B				10.02	5.17	1.64	1.94	0.51				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				2091	1081	398	465	122				
Chromium Cr				0.21	0.16	0.05	0.02	0.01				
Cobalt Co				0.06	0.03	0.01	0.01	0.00				
Copper Cu				0.44	0.22	0.06	0.07	0.02				
Iron Fe				62.01	28.09	10.76	12.65	3.33				
Lead Pb				0.03	0.01	0.00	0.00	0.00				
Lithium Li				1.51	0.71	0.22	0.28	0.07				
Magnesium Mg				1939	995	343	380	100				
Manganese Mn				1.42	0.65	0.28	0.37	0.10				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.10	0.05	0.01	0.02	0.00				
Nickel Ni				0.21	0.10	0.03	0.03	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				1016	502	144	203	54				
Selenium Se				0.33	0.16	0.05	0.06	0.01				
Silicon SiO2				403	190	59	74	19				
Silver Ag				0.03	0.02	0.00	0.00	0.00				
Sodium Na				14231	7174	2196	2756	726				
Strontium Sr				10	6	2	2	1				
Tellurium Te				15.58	7.35	2.28	2.86	0.75				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.04	0.05	0.01	0.02	0.00				
Titanium Ti				4.72	2.23	0.69	0.87	0.23				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.57	0.27	0.07	0.08	0.02				
Zinc Zn				0.5	0.2	0.1	0.5	0.1				
Zirconium Zr				1.57	0.74	0.23	0.29	0.08				

Table H 1-A-3
Scenario 1

Loadings to Tail Lake (kg/month)												
Date	Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16	Year 10 Jan-17
Parameter												
TDS				34279	17653	4570	6867	1808				
TSS				1516	715	222	278	73				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				614	374	94	167	44				
Chloride				24774	13313	3861	5007	1318				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				7791	4560	1234	1431	377				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				7	3	1	1	0				
Org. Carbon				1869.79	1029.75	274.19	286.13	75.33				
Hardness CaCO3				10284	6326	1691	2175	573				
Total Metals												
Aluminum Al				55.48	25.47	9.47	10.51	2.77				
Antimony Sb				0.05	0.04	0.03	0.04	0.01				
Arsenic As				0.15	0.08	0.02	0.03	0.01				
Barium Ba				0.52	0.28	0.12	0.13	0.03				
Beryllium Be				0.06	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.01	0.00	0.00	0.00				
Boron B				10.02	5.17	1.64	1.94	0.51				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				2092	1082	398	465	122				
Chromium Cr				0.22	0.16	0.05	0.02	0.01				
Cobalt Co				0.06	0.03	0.01	0.01	0.00				
Copper Cu				0.44	0.22	0.06	0.07	0.02				
Iron Fe				62.02	28.10	10.77	12.65	3.33				
Lead Pb				0.03	0.01	0.00	0.00	0.00				
Lithium Li				1.51	0.71	0.22	0.28	0.07				
Magnesium Mg				1939	995	343	380	100				
Manganese Mn				1.42	0.65	0.28	0.37	0.10				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.10	0.05	0.01	0.02	0.00				
Nickel Ni				0.21	0.10	0.03	0.03	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				1017	502	144	203	54				
Selenium Se				0.33	0.16	0.05	0.06	0.01				
Silicon SiO2				403	190	59	74	19				
Silver Ag				0.03	0.02	0.00	0.00	0.00				
Sodium Na				14235	7176	2197	2757	726				
Strontium Sr				10	6	2	2	1				
Tellurium Te				15.58	7.36	2.29	2.86	0.75				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.04	0.05	0.01	0.02	0.00				
Titanium Ti				4.73	2.23	0.69	0.87	0.23				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.57	0.27	0.07	0.08	0.02				
Zinc Zn				0.5	0.2	0.1	0.5	0.1				
Zirconium Zr				1.57	0.74	0.23	0.29	0.08				

Table H-1-B-1

Sc Scenario 1

OUTPUT SUMMARY							Fraction of CCME in Doris Creek (%)
Discharge rate		m3/year					
Degradation None		Tail Lk Cu < CME Year		35			
		MMER	CCME	Tail Lake Year 2	Doris Creek Year 9	L'Roberts L Year 9	
Maximum Concentration							
pH			6 to 9	7 to 8	7 to 8	7 to 8	
TDS	mg/L			652	172	178	
TSS	mg/L			4.8	7.0	8.1	
Free CN	mg/L		0.005	0.0060	0.00017	0.00009	3%
Total CN	mg/L	1.0		0.059	0.004	0.003	
WAD CN	mg/L			0.0080	0.0002	0.0001	
CNO	mg/L			6.6	0.19	0.10	
SCN	mg/L			0.090	0.003	0.001	
Sulphate	mg/L			83	5.5	5.8	
Chloride	mg/L			422	82	77	
Total Ammonia	mg/L		0.97	0.99	0.048	0.025	5%
Nitrate	mg/L		2.9	5.4	0.20	0.11	7%
Nitrite	mg/L		0.018	0.73	0.027	0.015	150%
Alkalinity	mg/L			52	28	26	
OrthoPhosphate-P	mg/L			0.1504	0.0059	0.0037	
Phosphate-P	mg/L			0.1537	0.0273	0.0263	
Org. Carbon	mg/L			6.4	7.5	7.1	
Hardness CaCO3	mg/L			100	47	46	
Total Metals							
Aluminum Al	mg/L		0.1	0.15	0.08	0.25	84%
Antimony Sb	mg/L			0.0138	0.0031	0.0019	
Arsenic As	mg/L	0.5	0.005	0.00	0.0005	0.0005	10%
Barium Ba	mg/L			0.0097	0.0033	0.0052	
Beryllium Be	mg/L			0.00056	0.00003	0.00002	
Bismuth Bi	mg/L			0.01323	0.00048	0.00034	
Boron B	mg/L			0.035	0.035	0.030	
Cadmium Cd	mg/L		0.000038	0.000051	0.0000039	0.0000153	10%
Calcium Ca	mg/L			225	14	11	
Chromium Cr	mg/L		0.001	0.0060	0.001	0.001	77%
Cobalt Co	mg/L			0.0094	0.0011	0.0005	
Copper Cu	mg/L	0.3	0.002	0.009	0.0017	0.0020	85%
Iron Fe	mg/L		0.3	0.17	0.13	0.28	42%
Lead Pb	mg/L	0.2	0.002	0.00038	0.00007	0.00026	3%
Lithium Li	mg/L			0.0054	0.0029	0.0029	
Magnesium Mg	mg/L			8.8	7.3	7.3	
Manganese Mn	mg/L			0.026	0.021	0.024	
Mercury Hg	mg/L		0.0001	0.0000116	0.0000012	0.0000009	1%
Molybdenum Mo	mg/L		0.073	0.0081	0.00039	0.00033	1%
Nickel Ni	mg/L	0.5	0.025	0.008	0.0007	0.0007	3%
Phosphorus P	mg/L			0.227	0.029	0.027	
Potassium K	mg/L			37	3.6	3.2	
Selenium Se	mg/L		0.001	0.00096	0.00090	0.00084	90%
Silicon SiO2	mg/L			3.6	0.61	0.57	
Silver Ag	mg/L		0.0001	0.00011	0.0000068	0.0000056	7%
Sodium Na	mg/L			117	43	40	
Strontium Sr	mg/L			0.081	0.043	0.047	
Tellurium Te	mg/L			0.052	0.050	0.052	
Thallium Tl	mg/L		0.0008	0.000041	0.000031	0.002001	4%
Thorium Th	mg/L			0.000044	0.0000025	0.0000013	
Tin Sn	mg/L			0.00209	0.00046	0.00004	
Titanium Ti	mg/L			0.0133	0.0064	0.0064	
Uranium U	mg/L			0.000077	0.000039	0.000044	
Vanadium V	mg/L			0.0031	0.0006	0.0005	
Zinc Zn	mg/L	0.5	0.03	0.021	0.0036	0.0055	12%
Zirconium Zr	mg/L			0.0055	0.0050	0.0052	

Table H-1-B-2
Scenario 1

Water Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter													
TDS	mg/L				140	121	125	145	145				
TSS	mg/L				4.0	5.9	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				2.8	2.7	2.9	3.0	3.0				
Chloride	mg/L				61	61	59	63	63				
Total Ammonia	mg/L				0.008	0.011	0.017	0.016	0.016				
Nitrate	mg/L				0.03	0.03	0.03	0.03	0.03				
Nitrite	mg/L				0.003	0.003	0.003	0.003	0.003				
Alkalinity	mg/L				28	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca	mg/L				9	8	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.024	0.020	0.020				
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.51	0.51	0.51	0.51	0.51				
Silver Ag	mg/L				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-1-B-2
Scenario 1

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter													
TDS	mg/L				140	121	125	145	145				
TSS	mg/L				4.0	5.9	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				2.8	2.7	2.9	3.0	3.0				
Chloride	mg/L				61	61	59	63	63				
Total Ammonia	mg/L				0.008	0.011	0.017	0.016	0.016				
Nitrate	mg/L				0.03	0.03	0.03	0.03	0.03				
Nitrite	mg/L				0.003	0.003	0.003	0.003	0.003				
Alkalinity	mg/L				28	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca	mg/L				9	8	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.024	0.020	0.020				
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.51	0.51	0.51	0.51	0.51				
Silver Ag	mg/L				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-1-B-2
Scenario 1

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter													
TDS	mg/L				140	121	125	145	145				
TSS	mg/L				4.0	5.9	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				2.8	2.7	2.9	3.0	3.0				
Chloride	mg/L				61	61	59	63	63				
Total Ammonia	mg/L				0.008	0.011	0.017	0.016	0.016				
Nitrate	mg/L				0.03	0.03	0.03	0.03	0.03				
Nitrite	mg/L				0.003	0.003	0.003	0.003	0.003				
Alkalinity	mg/L				28	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca	mg/L				9	8	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.024	0.020	0.020				
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.51	0.51	0.51	0.51	0.51				
Silver Ag	mg/L				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-1-B-2
Scenario 1

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter													
TDS	mg/L				140	121	125	145	145				
TSS	mg/L				4.0	5.9	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				2.8	2.7	2.9	3.0	3.0				
Chloride	mg/L				61	61	59	63	63				
Total Ammonia	mg/L				0.008	0.011	0.017	0.016	0.016				
Nitrate	mg/L				0.03	0.03	0.03	0.03	0.03				
Nitrite	mg/L				0.003	0.003	0.003	0.003	0.003				
Alkalinity	mg/L				28	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca	mg/L				9	8	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.024	0.020	0.020				
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.51	0.51	0.51	0.51	0.51				
Silver Ag	mg/L				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-1-B-2
Scenario 1

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter													
TDS	mg/L				140	121	125	145	145				
TSS	mg/L				4.0	5.9	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				2.8	2.7	2.9	3.0	3.0				
Chloride	mg/L				61	61	59	63	63				
Total Ammonia	mg/L				0.008	0.011	0.017	0.016	0.016				
Nitrate	mg/L				0.03	0.03	0.03	0.03	0.03				
Nitrite	mg/L				0.003	0.003	0.003	0.003	0.003				
Alkalinity	mg/L				28	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca	mg/L				9	8	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.024	0.020	0.020				
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.51	0.51	0.51	0.51	0.51				
Silver Ag	mg/L				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-1-B-2
Scenario 1

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter													
TDS	mg/L				140	121	125	145	145				
TSS	mg/L				4.0	5.9	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				2.8	2.7	2.8	3.0	3.0				
Chloride	mg/L				61	61	59	63	63				
Total Ammonia	mg/L				0.005	0.008	0.014	0.013	0.013				
Nitrate	mg/L				0.01	0.01	0.01	0.01	0.01				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				28	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00000	0.00000	0.00000	0.00000				
Bismuth Bi	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000025	0.0000025	0.0000020	0.0000020	0.0000020				
Calcium Ca	mg/L				8	8	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.024	0.020	0.020				
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000008	0.0000010	0.0000006	0.0000007	0.0000007				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L												
Tin Sn	mg/L				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000025	0.000030	0.000038	0.000031	0.000031				
Vanadium V	mg/L				0.0006	0.0000	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0032	0.0028	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-1-B-2
Scenario 1

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter													
TDS	mg/L				140	121	125	145	145				
TSS	mg/L				4.0	5.9	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				2.8	2.7	2.8	3.0	3.0				
Chloride	mg/L				61	61	59	63	63				
Total Ammonia	mg/L				0.005	0.008	0.014	0.013	0.013				
Nitrate	mg/L				0.01	0.01	0.01	0.01	0.01				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				28	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00000	0.00000	0.00000	0.00000				
Bismuth Bi	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000025	0.0000025	0.0000020	0.0000020	0.0000020				
Calcium Ca	mg/L				8	8	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.024	0.020	0.020				
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000008	0.0000010	0.0000006	0.0000007	0.0000007				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L												
Tin Sn	mg/L				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000025	0.000030	0.000038	0.000031	0.000031				
Vanadium V	mg/L				0.0006	0.0000	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0032	0.0028	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-1-B-2
Scenario 1

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter													
TDS	mg/L				140	135	125	145	145				
TSS	mg/L				4.0	5.8	6.0	7.0	7.0				
Free CN	mg/L					0.00013							
Total CN	mg/L				0.002	0.003	0.002	0.002	0.002				
WAD CN	mg/L					0.0002							
CNO	mg/L					0.15							
SCN	mg/L					0.002							
Sulphate	mg/L				2.8	4.6	2.8	3.0	3.0				
Chloride	mg/L				61	70	59	63	63				
Total Ammonia	mg/L				0.005	0.035	0.014	0.013	0.013				
Nitrate	mg/L				0.01	0.16	0.01	0.01	0.01				
Nitrite	mg/L				0.002	0.021	0.002	0.002	0.002				
Alkalinity	mg/L				28	26	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0047	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0213	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	44	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0012	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0005	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0033	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00002	0.00000	0.00000	0.00000				
Bismuth Bi	mg/L				0.00003	0.00037	0.00003	0.00003	0.00003				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000025	0.0000038	0.0000020	0.0000020	0.0000020				
Calcium Ca	mg/L				8	13	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0003	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0017	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00007	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0029	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000006	0.0000007	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00016	0.00033	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0007	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.023	0.024	0.020	0.020				
Potassium K	mg/L				2.8	3.2	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.50	0.58	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000008	0.0000052	0.0000006	0.0000007	0.0000007				
Sodium Na	mg/L				39	34	34	32	32				
Strontium Sr	mg/L				0.041	0.043	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L					0.000001							
Tin Sn	mg/L				0.00040	0.00044	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000025	0.000031	0.000038	0.000031	0.000031				
Vanadium V	mg/L				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0036	0.0028	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-1-B-2
Scenario 1

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter													
TDS	mg/L				163	121	147	145	172				
TSS	mg/L				4.0	5.9	5.9	7.0	6.8				
Free CN	mg/L				0.00014		0.00014		0.00017				
Total CN	mg/L				0.003	0.002	0.003	0.002	0.004				
WAD CN	mg/L				0.0002		0.0002		0.0002				
CNO	mg/L				0.16		0.15		0.19				
SCN	mg/L				0.002		0.002		0.003				
Sulphate	mg/L				4.9	2.7	4.8	3.0	5.5				
Chloride	mg/L				76	61	74	63	82				
Total Ammonia	mg/L				0.034	0.008	0.041	0.013	0.048				
Nitrate	mg/L				0.17	0.01	0.16	0.01	0.20				
Nitrite	mg/L				0.023	0.002	0.022	0.002	0.027				
Alkalinity	mg/L				28	25	28	27	27				
OrthoPhosphate-P	mg/L				0.0050	0.0008	0.0048	0.0008	0.0059				
Phosphate-P	mg/L				0.0203	0.0179	0.0273	0.0195	0.0239				
Org. Carbon	mg/L				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3	mg/L				47	43	44	44	45				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0007	0.0008	0.0031	0.0005	0.0009				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0030	0.0032	0.0031	0.0031	0.0033				
Beryllium Be	mg/L				0.00002	0.00000	0.00002	0.00000	0.00003				
Bismuth Bi	mg/L				0.00040	0.00003	0.00038	0.00003	0.00048				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000039	0.0000025	0.0000034	0.0000020	0.0000038				
Calcium Ca	mg/L				14	8	13	7	14				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0003	0.0001	0.0011	0.0001	0.0004				
Copper Cu	mg/L				0.0014	0.0015	0.0014	0.0015	0.0017				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00003	0.00006	0.00005	0.00004	0.00005				
Lithium Li	mg/L				0.0029	0.0028	0.0029	0.0028	0.0029				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000008	0.0000006	0.0000008	0.0000006	0.0000009				
Molybdenum Mo	mg/L				0.00035	0.00015	0.00036	0.00016	0.00039				
Nickel Ni	mg/L				0.0006	0.0006	0.0006	0.0004	0.0007				
Phosphorus P	mg/L				0.022	0.018	0.029	0.020	0.026				
Potassium K	mg/L				3.6	2.4	3.2	2.3	3.4				
Selenium Se	mg/L				0.00088	0.00057	0.00061	0.00056	0.00056				
Silicon SiO2	mg/L				0.59	0.50	0.59	0.50	0.61				
Silver Ag	mg/L				0.0000054	0.0000010	0.0000053	0.0000007	0.0000067				
Sodium Na	mg/L				43	33	38	32	37				
Strontium Sr	mg/L				0.041	0.042	0.037	0.040	0.041				
Tellurium Te	mg/L				0.049	0.050	0.050	0.050	0.049				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000001		0.000001		0.000002				
Tin Sn	mg/L				0.00045	0.00040	0.00044	0.00040	0.00046				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000030	0.000039	0.000031	0.000033				
Vanadium V	mg/L				0.0006	0.0000	0.0003	0.0001	0.0003				
Zinc Zn	mg/L				0.0014	0.0032	0.0033	0.0017	0.0023				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-1-B-2
Scenario 1

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)												
Date		Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16
Parameter												
TDS	mg/L				161	121	146	145	145			
TSS	mg/L				4.0	5.9	5.9	7.0	7.0			
Free CN	mg/L				0.00013		0.00013					
Total CN	mg/L				0.003	0.002	0.003	0.002	0.002			
WAD CN	mg/L				0.0002		0.0002					
CNO	mg/L				0.15		0.14					
SCN	mg/L				0.002		0.002					
Sulphate	mg/L				4.7	2.7	4.7	3.0	3.0			
Chloride	mg/L				76	61	73	63	63			
Total Ammonia	mg/L				0.032	0.008	0.039	0.013	0.013			
Nitrate	mg/L				0.16	0.01	0.15	0.01	0.01			
Nitrite	mg/L				0.022	0.002	0.021	0.002	0.002			
Alkalinity	mg/L				28	25	28	27	27			
OrthoPhosphate-P	mg/L				0.0047	0.0008	0.0045	0.0008	0.0008			
Phosphate-P	mg/L				0.0200	0.0179	0.0271	0.0195	0.0195			
Org. Carbon	mg/L				5.5	5.1	7.4	5.0	5.0			
Hardness CaCO3	mg/L				47	43	44	44	44			
Total Metals												
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07			
Antimony Sb	mg/L				0.0007	0.0008	0.0031	0.0005	0.0005			
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004			
Barium Ba	mg/L				0.0030	0.0032	0.0031	0.0031	0.0031			
Beryllium Be	mg/L				0.00002	0.00000	0.00002	0.00000	0.00000			
Bismuth Bi	mg/L				0.00038	0.00003	0.00036	0.00003	0.00003			
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022			
Cadmium Cd	mg/L				0.0000039	0.0000025	0.0000033	0.0000020	0.0000020			
Calcium Ca	mg/L				14	8	13	7	7			
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000			
Cobalt Co	mg/L				0.0003	0.0001	0.0011	0.0001	0.0001			
Copper Cu	mg/L				0.0014	0.0015	0.0014	0.0015	0.0015			
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09			
Lead Pb	mg/L				0.00003	0.00006	0.00005	0.00004	0.00004			
Lithium Li	mg/L				0.0029	0.0028	0.0029	0.0028	0.0028			
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5			
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010			
Mercury Hg	mg/L				0.0000008	0.0000006	0.0000008	0.0000006	0.0000006			
Molybdenum Mo	mg/L				0.00034	0.00015	0.00035	0.00016	0.00016			
Nickel Ni	mg/L				0.0006	0.0006	0.0006	0.0004	0.0004			
Phosphorus P	mg/L				0.022	0.018	0.029	0.020	0.020			
Potassium K	mg/L				3.6	2.4	3.2	2.3	2.3			
Selenium Se	mg/L				0.00088	0.00057	0.00062	0.00056	0.00056			
Silicon SiO2	mg/L				0.59	0.50	0.58	0.50	0.50			
Silver Ag	mg/L				0.0000055	0.0000010	0.0000053	0.0000007	0.0000007			
Sodium Na	mg/L				43	33	38	32	32			
Strontium Sr	mg/L				0.041	0.042	0.037	0.040	0.040			
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050			
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030			
Thorium Th	mg/L				0.000001		0.000001					
Tin Sn	mg/L				0.00044	0.00040	0.00044	0.00040	0.00040			
Titanium Ti	mg/L				0.0060	0.0060	0.0061	0.0060	0.0060			
Uranium U	mg/L				0.000026	0.000030	0.000039	0.000031	0.000031			
Vanadium V	mg/L				0.0006	0.0000	0.0003	0.0001	0.0001			
Zinc Zn	mg/L				0.0014	0.0032	0.0032	0.0017	0.0017			
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050			

Table H 1-A-3
Scenario 1

Loadings to Tail Lake (kg/month)												
Date	Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter												
TDS	81148	78530	81148	117442	100848	86227	86140	83147	78530	81148	81148	73295
TSS	183	177	183	1239	676	336	368	233	177	183	183	166
Free CN	1.10	1.06	1.10	1.06	1.10	1.10	1.06	1.10	1.06	1.10	1.10	0.99
Total CN	11	10	11	11	11	11	10	11	10	11	11	10
WAD CN	1.47	1.42	1.47	1.42	1.47	1.47	1.42	1.47	1.42	1.47	1.47	1.32
CNO	1210	1171	1210	1171	1210	1210	1171	1210	1171	1210	1210	1093
SCN	16	16	16	16	16	16	16	16	16	16	16	15
Sulphate	14302	13840	14302	18322	17066	15395	15291	14792	13840	14302	14302	12918
Chloride	49110	47526	49110	82360	70919	57259	58093	52595	47526	49110	49110	44357
Total Ammonia	149	145	149	288	238	187	194	166	145	149	149	135
Nitrate	758	733	758	1855	1453	1051	1108	888	733	758	758	684
Nitrite	116	112	116	139	132	123	121	119	112	116	116	105
Alkalinity	6928	6704	6928	15548	12017	8299	8290	7344	6704	6928	6928	6257
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	24	22	22	21	21	21	21	21	19
Org. Carbon				2122.46	1149.16	304.79	317.09	83.28				
Hardness CaCO3	14992	14508	14992	26182	22051	16871	16918	15625	14508	14992	14992	13541
Total Metals												
Aluminum Al	4.47	4.33	4.47	19.31	12.05	9.18	8.79	5.91	4.33	4.47	4.47	4.04
Antimony Sb	1.32	1.28	1.32	4.67	3.44	2.22	2.44	1.72	1.28	1.32	1.32	1.19
Arsenic As	0.39	0.38	0.39	0.69	0.59	0.47	0.47	0.43	0.38	0.39	0.39	0.36
Barium Ba	1.56	1.51	1.56	2.29	2.00	1.75	1.72	1.62	1.51	1.56	1.56	1.41
Beryllium Be	0.05	0.05	0.05	0.23	0.15	0.08	0.09	0.06	0.05	0.05	0.05	0.04
Bismuth Bi	1.23	1.19	1.23	4.55	3.31	2.10	2.31	1.62	1.19	1.23	1.23	1.11
Boron B	2.80	2.71	2.80	10.30	7.34	4.48	4.70	3.42	2.71	2.80	2.80	2.53
Cadmium Cd	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Calcium Ca	40484	39178	40484	42156	42150	41148	39979	40728	39178	40484	40484	36566
Chromium Cr	1.02	0.99	1.02	1.32	1.26	1.11	1.06	1.04	0.99	1.02	1.02	0.92
Cobalt Co	1.67	1.62	1.67	1.85	1.81	1.73	1.69	1.70	1.62	1.67	1.67	1.51
Copper Cu	1.46	1.41	1.46	1.84	1.69	1.52	1.49	1.48	1.41	1.46	1.46	1.32
Iron Fe	4.63	4.48	4.63	21.53	11.57	9.20	9.28	5.96	4.48	4.63	4.63	4.18
Lead Pb	0.05	0.05	0.05	0.13	0.10	0.07	0.07	0.06	0.05	0.05	0.05	0.04
Lithium Li	0.46	0.45	0.46	1.84	1.14	0.69	0.73	0.54	0.45	0.46	0.46	0.42
Magnesium Mg	1082	1047	1082	2866	2073	1453	1457	1200	1047	1082	1082	977
Manganese Mn	4.56	4.41	4.56	5.17	4.97	4.80	4.75	4.66	4.41	4.56	4.56	4.12
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	1.48	1.43	1.48	1.50	1.52	1.49	1.45	1.48	1.43	1.48	1.48	1.34
Nickel Ni	1.26	1.22	1.26	1.77	1.58	1.38	1.37	1.31	1.22	1.26	1.26	1.14
Phosphorus P	33	32	33	45	40	36	36	35	32	33	33	30
Potassium K	6696	6480	6696	7119	7030	6791	6626	6737	6480	6696	6696	6048
Selenium Se	0.04	0.04	0.04	0.21	0.12	0.06	0.07	0.05	0.04	0.04	0.04	0.03
Silicon SiO2	556	538	556	963	770	630	631	583	538	556	556	502
Silver Ag	0.01	0.01	0.01	0.06	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sodium Na	6353	6148	6353	11746	9467	7284	7317	6662	6148	6353	6353	5739
Strontium Sr	12	12	12	21	18	14	14	13	12	12	12	11
Tellurium Te	0.02	0.02	0.02	17.74	8.25	2.57	3.20	0.86	0.02	0.02	0.02	0.02
Thallium Tl	0.00	0.00	0.00	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.02	0.01	0.00	0.01	0.00				
Tin Sn	0.18	0.18	0.18	0.74	0.56	0.34	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.10	0.09	0.10	2.42	1.21	0.45	0.54	0.22	0.09	0.10	0.10	0.09
Uranium U	0.00	0.00	0.00	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.36	0.35	0.36	1.09	0.79	0.52	0.54	0.43	0.35	0.36	0.36	0.33
Zinc Zn	3.5	3.4	3.5	4.4	4.1	3.8	4.2	3.7	3.4	3.5	3.5	3.2
Zirconium Zr				2.10	1.03	0.34	0.43	0.12				

Table H 1-A-3
Scenario 1

Loadings to Tail Lake (kg/month)												
Date	Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter												
TDS	81148	78530	81148	115712	100109	86048	85877	83080	78530	81148	81148	73295
TSS	183	177	183	1191	657	330	361	232	177	183	183	166
Free CN	1.10	1.06	1.10	1.06	1.10	1.10	1.06	1.10	1.06	1.10	1.10	0.99
Total CN	11	10	11	11	11	11	10	11	10	11	11	10
WAD CN	1.47	1.42	1.47	1.42	1.47	1.47	1.42	1.47	1.42	1.47	1.47	1.32
CNO	1210	1171	1210	1171	1210	1210	1171	1210	1171	1210	1210	1093
SCN	16	16	16	16	16	16	16	16	16	16	16	15
Sulphate	14302	13840	14302	18291	17050	15391	15284	14790	13840	14302	14302	12918
Chloride	49110	47526	49110	81904	70673	57198	58011	52574	47526	49110	49110	44357
Total Ammonia	149	145	149	288	238	187	194	166	145	149	149	135
Nitrate	758	733	758	1855	1453	1051	1108	888	733	758	758	684
Nitrite	116	112	116	139	132	123	121	119	112	116	116	105
Alkalinity	6928	6704	6928	15155	11826	8251	8235	7330	6704	6928	6928	6257
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	24	22	22	21	21	21	21	21	19
Org. Carbon				2028.11	1106.10	294.04	306.11	80.51				
Hardness CaCO3	14992	14508	14992	25663	21786	16805	16835	15604	14508	14992	14992	13541
Total Metals												
Aluminum Al	4.47	4.33	4.47	19.05	11.98	9.10	8.74	5.89	4.33	4.47	4.47	4.04
Antimony Sb	1.32	1.28	1.32	4.67	3.44	2.22	2.44	1.72	1.28	1.32	1.32	1.19
Arsenic As	0.39	0.38	0.39	0.69	0.59	0.47	0.47	0.43	0.38	0.39	0.39	0.36
Barium Ba	1.56	1.51	1.56	2.26	1.98	1.75	1.72	1.62	1.51	1.56	1.56	1.41
Beryllium Be	0.05	0.05	0.05	0.23	0.15	0.08	0.09	0.06	0.05	0.05	0.05	0.04
Bismuth Bi	1.23	1.19	1.23	4.55	3.31	2.10	2.31	1.62	1.19	1.23	1.23	1.11
Boron B	2.80	2.71	2.80	10.12	7.25	4.45	4.67	3.41	2.71	2.80	2.80	2.53
Cadmium Cd	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Calcium Ca	40484	39178	40484	42075	42114	41135	39965	40724	39178	40484	40484	36566
Chromium Cr	1.02	0.99	1.02	1.31	1.26	1.11	1.06	1.04	0.99	1.02	1.02	0.92
Cobalt Co	1.67	1.62	1.67	1.85	1.81	1.73	1.69	1.70	1.62	1.67	1.67	1.51
Copper Cu	1.46	1.41	1.46	1.83	1.68	1.52	1.49	1.48	1.41	1.46	1.46	1.32
Iron Fe	4.63	4.48	4.63	20.87	11.36	9.06	9.14	5.92	4.48	4.63	4.63	4.18
Lead Pb	0.05	0.05	0.05	0.13	0.10	0.07	0.07	0.06	0.05	0.05	0.05	0.04
Lithium Li	0.46	0.45	0.46	1.79	1.12	0.68	0.72	0.54	0.45	0.46	0.46	0.42
Magnesium Mg	1082	1047	1082	2802	2045	1443	1447	1198	1047	1082	1082	977
Manganese Mn	4.56	4.41	4.56	5.16	4.96	4.80	4.74	4.66	4.41	4.56	4.56	4.12
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	1.48	1.43	1.48	1.50	1.52	1.49	1.45	1.48	1.43	1.48	1.48	1.34
Nickel Ni	1.26	1.22	1.26	1.76	1.57	1.38	1.36	1.31	1.22	1.26	1.26	1.14
Phosphorus P	33	32	33	45	40	36	36	35	32	33	33	30
Potassium K	6696	6480	6696	7094	7019	6789	6622	6736	6480	6696	6696	6048
Selenium Se	0.04	0.04	0.04	0.20	0.12	0.06	0.07	0.05	0.04	0.04	0.04	0.03
Silicon SiO2	556	538	556	949	764	628	629	583	538	556	556	502
Silver Ag	0.01	0.01	0.01	0.06	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sodium Na	6353	6148	6353	11499	9351	7252	7277	6652	6148	6353	6353	5739
Strontium Sr	12	12	12	20	17	14	14	13	12	12	12	11
Tellurium Te	0.02	0.02	0.02	16.95	7.94	2.48	3.09	0.83	0.02	0.02	0.02	0.02
Thallium Tl	0.00	0.00	0.00	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.02	0.01	0.00	0.01	0.00				
Tin Sn	0.18	0.18	0.18	0.74	0.56	0.33	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.10	0.09	0.10	2.32	1.17	0.44	0.53	0.22	0.09	0.10	0.10	0.09
Uranium U	0.00	0.00	0.00	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.36	0.35	0.36	1.08	0.79	0.52	0.54	0.43	0.35	0.36	0.36	0.33
Zinc Zn	3.5	3.4	3.5	4.4	4.1	3.8	4.1	3.7	3.4	3.5	3.5	3.2
Zirconium Zr				2.02	1.00	0.33	0.42	0.12				

Table H 1-A-3
Scenario 1

Loadings to Tail Lake (kg/month)												
Date	Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter												
TDS	50662	49028	50662	85311	69216	55462	56228	52557	49028	50662	50662	45759
TSS				990	464	144	180	47				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate	1289	1247	1289	5581	3967	2350	2654	1765	1247	1289	1289	1164
Chloride	49110	47526	49110	81667	70537	57164	57966	52563	47526	49110	49110	44357
Total Ammonia	25	24	25	153	104	58	68	40	24	25	25	22
Nitrate	29	28	29	1036	654	292	365	147	28	29	29	26
Nitrite	64	62	64	86	79	71	70	67	62	64	64	58
Alkalinity				8246	4793	1296	1500	395				
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	24	22	22	21	21	21	21	21	19
Org. Carbon				1979.12	1082.35	288.03	300.01	78.97				
Hardness CaCO3				10885	6649	1776	2280	600				
Total Metals												
Aluminum Al	0.81	0.78	0.81	12.42	6.44	4.62	4.18	1.88	0.78	0.81	0.81	0.73
Antimony Sb	1.21	1.17	1.21	4.55	3.32	2.11	2.33	1.61	1.17	1.21	1.21	1.09
Arsenic As	0.03	0.03	0.03	0.27	0.18	0.08	0.10	0.05	0.03	0.03	0.03	0.02
Barium Ba	0.06	0.06	0.06	0.79	0.47	0.24	0.26	0.12	0.06	0.06	0.06	0.05
Beryllium Be	0.03	0.03	0.03	0.20	0.12	0.06	0.06	0.04	0.03	0.03	0.03	0.03
Bismuth Bi	1.21	1.17	1.21	4.52	3.28	2.08	2.29	1.60	1.17	1.21	1.21	1.09
Boron B	0.60	0.58	0.60	7.20	4.57	2.06	2.30	1.13	0.58	0.60	0.60	0.55
Cadmium Cd	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Calcium Ca	263	254	263	2936	1766	861	975	480	254	263	263	237
Chromium Cr	0.07	0.06	0.07	0.37	0.30	0.16	0.13	0.09	0.06	0.07	0.07	0.06
Cobalt Co	0.06	0.06	0.06	0.28	0.19	0.11	0.13	0.08	0.06	0.06	0.06	0.05
Copper Cu	0.03	0.03	0.03	0.42	0.24	0.09	0.10	0.05	0.03	0.03	0.03	0.03
Iron Fe	0.23	0.23	0.23	15.58	6.42	4.40	4.57	1.42	0.23	0.23	0.23	0.21
Lead Pb	0.01	0.01	0.01	0.08	0.05	0.03	0.03	0.02	0.01	0.01	0.01	0.01
Lithium Li	0.06	0.06	0.06	1.36	0.70	0.27	0.32	0.14	0.06	0.06	0.06	0.05
Magnesium Mg	121	117	121	1822	1058	473	507	234	117	121	121	110
Manganese Mn	0.16	0.15	0.16	0.88	0.55	0.39	0.47	0.26	0.15	0.16	0.16	0.14
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	0.01	0.01	0.01	0.08	0.05	0.02	0.03	0.02	0.01	0.01	0.01	0.01
Nickel Ni	0.12	0.12	0.12	0.64	0.42	0.24	0.26	0.17	0.12	0.12	0.12	0.11
Phosphorus P	23	22	23	33	29	25	25	24	22	23	23	21
Potassium K	25	24	25	621	340	115	162	64	24	25	25	23
Selenium Se	0.00	0.00	0.00	0.15	0.07	0.02	0.03	0.01	0.00	0.00	0.00	0.00
Silicon SiO2	10	9	10	380	195	72	88	33	9	10	10	9
Silver Ag	0.00	0.00	0.00	0.05	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Sodium Na	12	12	12	5230	2943	891	1117	304	12	12	12	11
Strontium Sr	0	0	0	9	5	2	2	1	0	0	0	0
Tellurium Te				16.51	7.74	2.41	3.01	0.79				
Thallium Tl	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn	0.18	0.18	0.18	0.73	0.55	0.33	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.06	0.06	0.06	2.22	1.10	0.40	0.48	0.18	0.06	0.06	0.06	0.05
Uranium U	0.00	0.00	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.18	0.18	0.18	0.87	0.59	0.33	0.36	0.24	0.18	0.18	0.18	0.16
Zinc Zn	0.2	0.2	0.2	1.1	0.8	0.5	0.9	0.4	0.2	0.2	0.2	0.2
Zirconium Zr				1.85	0.90	0.29	0.37	0.10				

Table H 1-A-3
Scenario 1

Loadings to Tail Lake (kg/month)												
Date	Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter												
TDS				35824	18335	4745	7119	1874				
TSS				977	458	142	178	47				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				788	479	136	222	63				
Chloride				9445	6112	1613	2195	578				
Total Ammonia				61	37	16	21	7				
Nitrate				470	291	122	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				8142	4737	1281	1483	391				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1954.05	1069.54	284.73	296.63	78.10				
Hardness CaCO3				10747	6570	1756	2254	594				
Total Metals												
Aluminum Al				9.66	4.43	3.29	2.74	0.85				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.16	0.10	0.04	0.04	0.01				
Barium Ba				0.55	0.30	0.13	0.14	0.04				
Beryllium Be				0.08	0.04	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				4.91	2.91	1.01	1.15	0.33				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				1938	1045	406	475	132				
Chromium Cr				0.14	0.13	0.05	0.01	0.00				
Cobalt Co				0.05	0.03	0.01	0.01	0.00				
Copper Cu				0.32	0.17	0.04	0.05	0.01				
Iron Fe				14.68	5.82	3.99	4.14	1.12				
Lead Pb				0.04	0.02	0.01	0.01	0.00				
Lithium Li				1.12	0.53	0.17	0.21	0.05				
Magnesium Mg				1354	722	261	275	73				
Manganese Mn				0.28	0.12	0.12	0.17	0.05				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.19	0.10	0.03	0.03	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				521	268	71	113	30				
Selenium Se				0.15	0.07	0.02	0.03	0.01				
Silicon SiO2				341	167	55	69	20				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				5119	2876	861	1082	285				
Strontium Sr				7	4	1	2	0				
Tellurium Te				16.30	7.65	2.38	2.97	0.78				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.05	0.06	0.02	0.02	0.01				
Titanium Ti				1.97	0.93	0.29	0.36	0.10				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.20	0.10	0.02	0.01	0.00				
Zinc Zn				0.4	0.2	0.1	0.5	0.1				
Zirconium Zr				1.83	0.89	0.29	0.36	0.10				

Table H 1-A-3
Scenario 1

Loadings to Tail Lake (kg/month)												
Date	Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter												
TDS				35462	18155	4699	7050	1856				
TSS				967	454	141	176	46				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				782	475	135	220	62				
Chloride				9349	6052	1598	2174	572				
Total Ammonia				61	37	16	21	7				
Nitrate				470	291	122	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				8060	4690	1269	1469	387				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1934.32	1059.04	281.96	293.75	77.35				
Hardness CaCO3				10639	6506	1739	2232	588				
Total Metals												
Aluminum Al				9.61	4.41	3.27	2.73	0.84				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.16	0.10	0.04	0.04	0.01				
Barium Ba				0.55	0.30	0.13	0.14	0.04				
Beryllium Be				0.08	0.04	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				4.87	2.89	1.00	1.14	0.33				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				1921	1036	403	471	131				
Chromium Cr				0.14	0.12	0.05	0.01	0.00				
Cobalt Co				0.05	0.03	0.01	0.01	0.00				
Copper Cu				0.32	0.17	0.04	0.05	0.01				
Iron Fe				14.54	5.76	3.95	4.10	1.11				
Lead Pb				0.04	0.02	0.01	0.01	0.00				
Lithium Li				1.11	0.52	0.16	0.20	0.05				
Magnesium Mg				1341	715	259	272	72				
Manganese Mn				0.28	0.12	0.11	0.17	0.05				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.19	0.09	0.03	0.03	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				516	266	70	112	30				
Selenium Se				0.15	0.07	0.02	0.03	0.01				
Silicon SiO2				338	166	55	69	19				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				5068	2848	852	1071	282				
Strontium Sr				7	4	1	2	0				
Tellurium Te				16.14	7.58	2.35	2.94	0.78				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.05	0.06	0.02	0.02	0.01				
Titanium Ti				1.95	0.92	0.29	0.36	0.10				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.19	0.10	0.02	0.01	0.00				
Zinc Zn				0.4	0.2	0.1	0.5	0.1				
Zirconium Zr				1.81	0.88	0.29	0.36	0.10				

Table H 1-A-3
Scenario 1

Loadings to Tail Lake (kg/month)												
Date	Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter												
TDS				35119	17981	4654	6983	1839				
TSS				958	450	140	175	46				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				776	472	134	218	62				
Chloride				9259	5994	1583	2153	567				
Total Ammonia				61	37	16	21	7				
Nitrate				469	291	122	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				7982	4645	1257	1455	383				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1915.59	1048.87	279.26	290.95	76.61				
Hardness CaCO3				10536	6443	1722	2211	582				
Total Metals												
Aluminum Al				9.55	4.40	3.25	2.72	0.84				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.16	0.10	0.04	0.04	0.01				
Barium Ba				0.54	0.30	0.13	0.14	0.04				
Beryllium Be				0.08	0.04	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				4.83	2.87	1.00	1.13	0.33				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				1905	1028	399	468	130				
Chromium Cr				0.14	0.12	0.04	0.01	0.00				
Cobalt Co				0.05	0.03	0.01	0.01	0.00				
Copper Cu				0.31	0.17	0.04	0.05	0.01				
Iron Fe				14.41	5.71	3.92	4.06	1.10				
Lead Pb				0.04	0.02	0.01	0.01	0.00				
Lithium Li				1.10	0.52	0.16	0.20	0.05				
Magnesium Mg				1328	708	257	270	72				
Manganese Mn				0.28	0.12	0.11	0.17	0.04				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.19	0.09	0.03	0.03	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				511	263	70	111	29				
Selenium Se				0.15	0.07	0.02	0.03	0.01				
Silicon SiO2				335	164	54	68	19				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				5019	2821	844	1061	280				
Strontium Sr				7	4	1	2	0				
Tellurium Te				15.98	7.50	2.33	2.92	0.77				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.05	0.06	0.02	0.02	0.01				
Titanium Ti				1.94	0.91	0.28	0.36	0.09				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.19	0.10	0.02	0.01	0.00				
Zinc Zn				0.4	0.2	0.1	0.5	0.1				
Zirconium Zr				1.79	0.87	0.28	0.36	0.10				

Table H 1-A-3
Scenario 1

Loadings to Tail Lake (kg/month)												
Date	Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter												
TDS				34781	17807	4610	6916	1821				
TSS				949	445	138	173	46				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				623	377	94	168	44				
Chloride				9170	5936	1567	2132	561				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				7905	4600	1245	1441	379				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1897.16	1038.72	276.57	288.16	75.87				
Hardness CaCO3				10434	6381	1706	2190	577				
Total Metals												
Aluminum Al				5.22	1.72	2.11	1.27	0.34				
Antimony Sb				0.04	0.04	0.03	0.04	0.01				
Arsenic As				0.06	0.04	0.01	0.01	0.00				
Barium Ba				0.52	0.29	0.13	0.13	0.04				
Beryllium Be				0.06	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.00	0.00	0.00	0.00				
Boron B				3.79	2.23	0.73	0.79	0.21				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				1638	864	331	380	100				
Chromium Cr				0.12	0.11	0.04	0.01	0.00				
Cobalt Co				0.03	0.01	0.00	0.01	0.00				
Copper Cu				0.28	0.15	0.03	0.04	0.01				
Iron Fe				13.28	5.05	3.62	3.69	0.97				
Lead Pb				0.02	0.01	0.00	0.00	0.00				
Lithium Li				1.07	0.50	0.16	0.19	0.05				
Magnesium Mg				1290	686	248	259	68				
Manganese Mn				0.25	0.10	0.11	0.16	0.04				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.16	0.08	0.02	0.02	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				500	257	67	108	28				
Selenium Se				0.13	0.06	0.02	0.02	0.00				
Silicon SiO2				285	134	41	52	14				
Silver Ag				0.03	0.01	0.00	0.00	0.00				
Sodium Na				4964	2790	834	1049	276				
Strontium Sr				7	4	1	2	0				
Tellurium Te				15.81	7.42	2.30	2.88	0.76				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th												
Tin Sn				0.03	0.04	0.01	0.02	0.00				
Titanium Ti				1.90	0.89	0.28	0.35	0.09				
Uranium U				0.02	0.01	0.00	0.00	0.00				
Vanadium V				0.15	0.07	0.01	0.00	0.00				
Zinc Zn				0.3	0.1	0.1	0.5	0.1				
Zirconium Zr				1.58	0.74	0.23	0.29	0.08				

Table H 1-A-3
Scenario 1

Loadings to Tail Lake (kg/month)												
Date	Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter												
TDS				412653	395842	382791	385082	380021				
TSS				1523	714	223	278	73				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				617	373	94	167	44				
Chloride				255283	243688	234261	235402	231711				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				7827	4554	1236	1431	377				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				7	3	1	1	0				
Org. Carbon				1878.57	1028.37	274.71	286.23	75.36				
Hardness CaCO3				10332	6317	1694	2175	573				
Total Metals												
Aluminum Al				55.74	25.43	9.49	10.51	2.77				
Antimony Sb				0.05	0.04	0.03	0.04	0.01				
Arsenic As				0.15	0.08	0.02	0.03	0.01				
Barium Ba				0.52	0.28	0.12	0.13	0.03				
Beryllium Be				0.06	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.01	0.00	0.00	0.00				
Boron B				10.07	5.16	1.65	1.94	0.51				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				24376	23355	22673	22740	22397				
Chromium Cr				0.22	0.16	0.05	0.02	0.01				
Cobalt Co				0.06	0.03	0.01	0.01	0.00				
Copper Cu				0.44	0.22	0.06	0.07	0.02				
Iron Fe				62.31	28.06	10.79	12.66	3.33				
Lead Pb				0.03	0.01	0.00	0.00	0.00				
Lithium Li				1.52	0.71	0.22	0.28	0.07				
Magnesium Mg				1949	994	344	380	100				
Manganese Mn				1.42	0.65	0.28	0.37	0.10				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.10	0.05	0.01	0.02	0.00				
Nickel Ni				0.21	0.10	0.03	0.03	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				1021	501	144	203	54				
Selenium Se				0.33	0.16	0.05	0.06	0.01				
Silicon SiO2				405	190	59	74	20				
Silver Ag				0.03	0.02	0.00	0.00	0.00				
Sodium Na				139847	132711	127746	128303	126271				
Strontium Sr				10	6	2	2	1				
Tellurium Te				15.66	7.35	2.29	2.86	0.75				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.04	0.05	0.01	0.02	0.00				
Titanium Ti				4.75	2.23	0.69	0.87	0.23				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.57	0.27	0.07	0.08	0.02				
Zinc Zn				0.5	0.2	0.1	0.5	0.1				
Zirconium Zr				1.58	0.74	0.23	0.29	0.08				

Table H 1-A-3
Scenario 1

Loadings to Tail Lake (kg/month)												
Date	Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter												
TDS				34270	17648	4569	6865	1807				
TSS				1515	715	222	278	73				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				614	374	94	166	44				
Chloride				24767	13309	3860	5006	1318				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				7789	4559	1233	1430	377				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				7	3	1	1	0				
Org. Carbon				1869.25	1029.46	274.11	286.05	75.31				
Hardness CaCO3				10281	6324	1690	2174	572				
Total Metals												
Aluminum Al				55.46	25.46	9.47	10.51	2.77				
Antimony Sb				0.05	0.04	0.03	0.04	0.01				
Arsenic As				0.15	0.08	0.02	0.03	0.01				
Barium Ba				0.52	0.28	0.12	0.13	0.03				
Beryllium Be				0.06	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.01	0.00	0.00	0.00				
Boron B				10.02	5.17	1.64	1.94	0.51				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				2091	1081	398	465	122				
Chromium Cr				0.21	0.16	0.05	0.02	0.01				
Cobalt Co				0.06	0.03	0.01	0.01	0.00				
Copper Cu				0.44	0.22	0.06	0.07	0.02				
Iron Fe				62.01	28.09	10.76	12.65	3.33				
Lead Pb				0.03	0.01	0.00	0.00	0.00				
Lithium Li				1.51	0.71	0.22	0.28	0.07				
Magnesium Mg				1939	995	343	380	100				
Manganese Mn				1.42	0.65	0.28	0.37	0.10				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.10	0.05	0.01	0.02	0.00				
Nickel Ni				0.21	0.10	0.03	0.03	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				1016	502	144	203	54				
Selenium Se				0.33	0.16	0.05	0.06	0.01				
Silicon SiO2				403	190	59	74	19				
Silver Ag				0.03	0.02	0.00	0.00	0.00				
Sodium Na				14231	7174	2196	2756	726				
Strontium Sr				10	6	2	2	1				
Tellurium Te				15.58	7.35	2.28	2.86	0.75				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.04	0.05	0.01	0.02	0.00				
Titanium Ti				4.72	2.23	0.69	0.87	0.23				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.57	0.27	0.07	0.08	0.02				
Zinc Zn				0.5	0.2	0.1	0.5	0.1				
Zirconium Zr				1.57	0.74	0.23	0.29	0.08				

Table H 1-A-3
Scenario 1

Loadings to Tail Lake (kg/month)												
Date	Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16	Year 10 Jan-17
Parameter												
TDS				34279	17653	4570	6867	1808				
TSS				1516	715	222	278	73				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				614	374	94	167	44				
Chloride				24774	13313	3861	5007	1318				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				7791	4560	1234	1431	377				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				7	3	1	1	0				
Org. Carbon				1869.79	1029.75	274.19	286.13	75.33				
Hardness CaCO3				10284	6326	1691	2175	573				
Total Metals												
Aluminum Al				55.48	25.47	9.47	10.51	2.77				
Antimony Sb				0.05	0.04	0.03	0.04	0.01				
Arsenic As				0.15	0.08	0.02	0.03	0.01				
Barium Ba				0.52	0.28	0.12	0.13	0.03				
Beryllium Be				0.06	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.01	0.00	0.00	0.00				
Boron B				10.02	5.17	1.64	1.94	0.51				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				2092	1082	398	465	122				
Chromium Cr				0.22	0.16	0.05	0.02	0.01				
Cobalt Co				0.06	0.03	0.01	0.01	0.00				
Copper Cu				0.44	0.22	0.06	0.07	0.02				
Iron Fe				62.02	28.10	10.77	12.65	3.33				
Lead Pb				0.03	0.01	0.00	0.00	0.00				
Lithium Li				1.51	0.71	0.22	0.28	0.07				
Magnesium Mg				1939	995	343	380	100				
Manganese Mn				1.42	0.65	0.28	0.37	0.10				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.10	0.05	0.01	0.02	0.00				
Nickel Ni				0.21	0.10	0.03	0.03	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				1017	502	144	203	54				
Selenium Se				0.33	0.16	0.05	0.06	0.01				
Silicon SiO2				403	190	59	74	19				
Silver Ag				0.03	0.02	0.00	0.00	0.00				
Sodium Na				14235	7176	2197	2757	726				
Strontium Sr				10	6	2	2	1				
Tellurium Te				15.58	7.36	2.29	2.86	0.75				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.04	0.05	0.01	0.02	0.00				
Titanium Ti				4.73	2.23	0.69	0.87	0.23				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.57	0.27	0.07	0.08	0.02				
Zinc Zn				0.5	0.2	0.1	0.5	0.1				
Zirconium Zr				1.57	0.74	0.23	0.29	0.08				

Table H-1-C-1

Scenario 1

OUTPUT SUMMARY							Fraction of CCME in Doris Creek (%)
Discharge rate		m3/year					
Degradation None		Tail Lk Cu < CME Year		35			
		MMER	CCME	Tail Lake Year 2	Doris Creek Year 9	L'Roberts L Year 9	Creek (%)
Maximum Concentration							
pH			6 to 9	7 to 8	7 to 8	7 to 8	
TDS	mg/L			652	172	178	
TSS	mg/L			4.8	7.0	8.1	
Free CN	mg/L		0.005	0.0060	0.00017	0.00009	3%
Total CN	mg/L	1.0		0.059	0.004	0.003	
WAD CN	mg/L			0.0080	0.0002	0.0001	
CNO	mg/L			6.6	0.19	0.10	
SCN	mg/L			0.090	0.003	0.001	
Sulphate	mg/L			83	5.5	5.8	
Chloride	mg/L			422	82	77	
Total Ammonia	mg/L		0.97	0.99	0.048	0.025	5%
Nitrate	mg/L		2.9	5.4	0.20	0.11	7%
Nitrite	mg/L		0.018	0.73	0.027	0.015	150%
Alkalinity	mg/L			52	28	26	
OrthoPhosphate-P	mg/L			0.1504	0.0059	0.0037	
Phosphate-P	mg/L			0.1537	0.0273	0.0263	
Org. Carbon	mg/L			6.4	7.5	7.1	
Hardness CaCO3	mg/L			100	47	46	
Total Metals							
Aluminum Al	mg/L		0.1	0.15	0.08	0.25	84%
Antimony Sb	mg/L			0.0138	0.0031	0.0019	
Arsenic As	mg/L	0.5	0.005	0.00	0.0005	0.0005	10%
Barium Ba	mg/L			0.0097	0.0033	0.0052	
Beryllium Be	mg/L			0.00056	0.00003	0.00002	
Bismuth Bi	mg/L			0.01323	0.00048	0.00034	
Boron B	mg/L			0.035	0.035	0.030	
Cadmium Cd	mg/L		0.000038	0.000051	0.0000039	0.0000153	10%
Calcium Ca	mg/L			225	14	11	
Chromium Cr	mg/L		0.001	0.0060	0.001	0.001	77%
Cobalt Co	mg/L			0.0094	0.0011	0.0005	
Copper Cu	mg/L	0.3	0.002	0.009	0.0017	0.0020	85%
Iron Fe	mg/L		0.3	0.17	0.13	0.28	42%
Lead Pb	mg/L	0.2	0.002	0.00038	0.00007	0.00026	3%
Lithium Li	mg/L			0.0054	0.0029	0.0029	
Magnesium Mg	mg/L			8.8	7.3	7.3	
Manganese Mn	mg/L			0.026	0.021	0.024	
Mercury Hg	mg/L		0.0001	0.0000116	0.0000012	0.0000009	1%
Molybdenum Mo	mg/L		0.073	0.0081	0.00039	0.00033	1%
Nickel Ni	mg/L	0.5	0.025	0.008	0.0007	0.0007	3%
Phosphorus P	mg/L			0.227	0.029	0.027	
Potassium K	mg/L			37	3.6	3.2	
Selenium Se	mg/L		0.001	0.00096	0.00090	0.00084	90%
Silicon SiO2	mg/L			3.6	0.61	0.57	
Silver Ag	mg/L		0.0001	0.00011	0.0000068	0.0000056	7%
Sodium Na	mg/L			117	43	40	
Strontium Sr	mg/L			0.081	0.043	0.047	
Tellurium Te	mg/L			0.052	0.050	0.052	
Thallium Tl	mg/L		0.0008	0.000041	0.000031	0.002001	4%
Thorium Th	mg/L			0.000044	0.0000025	0.0000013	
Tin Sn	mg/L			0.00209	0.00046	0.00004	
Titanium Ti	mg/L			0.0133	0.0064	0.0064	
Uranium U	mg/L			0.000077	0.000039	0.000044	
Vanadium V	mg/L			0.0031	0.0006	0.0005	
Zinc Zn	mg/L	0.5	0.03	0.021	0.0036	0.0055	12%
Zirconium Zr	mg/L			0.0055	0.0050	0.0052	

Table H-1-C-2
Scenario 1

Water Quality in Little Roberst Lake Outflow

Date		Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter													
TDS	mg/L				150	150	140	160	160				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				3.8	3.7	4.7	4.5	4.5				
Chloride	mg/L				61	58	57	65	65				
Total Ammonia	mg/L				0.007	0.007	0.002	0.009	0.009				
Nitrate	mg/L				0.02	0.02	0.01	0.02	0.02				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0010	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0160	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00000	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00010	0.00010	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000028	0.0000044	0.0000149	0.0000024	0.0000024				
Calcium Ca	mg/L				8	7	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00016	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0005	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.2	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000038	0.0000010	0.0000034	0.0000018	0.0000018				
Sodium Na	mg/L				37	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00000	0.00000	0.00000	0.00000	0.00000				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-1-C-2
Scenario 1

Water Quality in Little Roberst Lake Outflow

Date		Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter													
TDS	mg/L				150	150	140	160	160				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				3.8	3.7	4.7	4.5	4.5				
Chloride	mg/L				61	58	57	65	65				
Total Ammonia	mg/L				0.007	0.007	0.002	0.009	0.009				
Nitrate	mg/L				0.02	0.02	0.01	0.02	0.02				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0010	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0160	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00000	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00010	0.00010	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000028	0.0000044	0.0000149	0.0000024	0.0000024				
Calcium Ca	mg/L				8	7	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00016	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0005	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.2	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000038	0.0000010	0.0000034	0.0000018	0.0000018				
Sodium Na	mg/L				37	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00000	0.00000	0.00000	0.00000	0.00000				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-1-C-2
Scenario 1

Water Quality in Little Roberst Lake Outflow

Date		Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter													
TDS	mg/L				150	150	140	160	160				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				3.8	3.7	4.7	4.5	4.5				
Chloride	mg/L				61	58	57	65	65				
Total Ammonia	mg/L				0.007	0.007	0.002	0.009	0.009				
Nitrate	mg/L				0.02	0.02	0.01	0.02	0.02				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0010	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0160	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00000	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00010	0.00010	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000028	0.0000044	0.0000149	0.0000024	0.0000024				
Calcium Ca	mg/L				8	7	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00016	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0005	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.2	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000038	0.0000010	0.0000034	0.0000018	0.0000018				
Sodium Na	mg/L				37	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00000	0.00000	0.00000	0.00000	0.00000				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-1-C-2
Scenario 1

Water Quality in Little Roberst Lake Outflow

Date		Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter													
TDS	mg/L				150	150	140	160	160				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				3.8	3.7	4.7	4.5	4.5				
Chloride	mg/L				61	58	57	65	65				
Total Ammonia	mg/L				0.007	0.007	0.002	0.009	0.009				
Nitrate	mg/L				0.02	0.02	0.01	0.02	0.02				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0010	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0160	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00000	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00010	0.00010	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000028	0.0000044	0.0000149	0.0000024	0.0000024				
Calcium Ca	mg/L				8	7	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00016	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0005	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.2	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000038	0.0000010	0.0000034	0.0000018	0.0000018				
Sodium Na	mg/L				37	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00000	0.00000	0.00000	0.00000	0.00000				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-1-C-2
Scenario 1

Water Quality in Little Roberst Lake Outflow

Date		Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter													
TDS	mg/L				150	150	140	160	160				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				3.8	3.7	4.7	4.5	4.5				
Chloride	mg/L				61	58	57	65	65				
Total Ammonia	mg/L				0.007	0.007	0.002	0.009	0.009				
Nitrate	mg/L				0.02	0.02	0.01	0.02	0.02				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0010	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0160	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00000	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00010	0.00010	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000028	0.0000044	0.0000149	0.0000024	0.0000024				
Calcium Ca	mg/L				8	7	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00016	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0005	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.2	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000038	0.0000010	0.0000034	0.0000018	0.0000018				
Sodium Na	mg/L				37	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00000	0.00000	0.00000	0.00000	0.00000				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-1-C-2
Scenario 1

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter													
TDS	mg/L				150	150	140	160	160				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				3.8	3.7	4.7	4.4	4.4				
Chloride	mg/L				61	58	57	65	65				
Total Ammonia	mg/L				0.005	0.005		0.007	0.007				
Nitrate	mg/L				0.01	0.01		0.01	0.01				
Nitrite	mg/L				0.002	0.002		0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0010	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0160	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00000	0.00000	0.00000	0.00000				
Bismuth Bi	mg/L				0.00010	0.00010	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000024	0.0000040	0.0000145	0.0000020	0.0000020				
Calcium Ca	mg/L				8	7	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00016	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0005	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.2	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000032	0.0000005	0.0000029	0.0000013	0.0000013				
Sodium Na	mg/L				37	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L												
Tin Sn	mg/L												
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000035	0.000031	0.000034	0.000042	0.000042				
Vanadium V	mg/L				0.0004	0.0001	0.0004	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-1-C-2
Scenario 1

Water Quality in Little Roberst Lake Outflow

Date		Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter													
TDS	mg/L				150	150	140	160	160				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				3.8	3.7	4.7	4.4	4.4				
Chloride	mg/L				61	58	57	65	65				
Total Ammonia	mg/L				0.005	0.005		0.007	0.007				
Nitrate	mg/L				0.01	0.01		0.01	0.01				
Nitrite	mg/L				0.002	0.002		0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0010	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0160	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00000	0.00000	0.00000	0.00000				
Bismuth Bi	mg/L				0.00010	0.00010	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000024	0.0000040	0.0000145	0.0000020	0.0000020				
Calcium Ca	mg/L				8	7	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00016	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0005	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.2	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000032	0.0000005	0.0000029	0.0000013	0.0000013				
Sodium Na	mg/L				37	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L												
Tin Sn	mg/L												
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000035	0.000031	0.000034	0.000042	0.000042				
Vanadium V	mg/L				0.0004	0.0001	0.0004	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-1-C-2
Scenario 1

Water Quality in Little Roberst Lake Outflow

Date		Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter													
TDS	mg/L				150	159	140	160	160				
TSS	mg/L				7.0	8.1	4.0	5.0	5.0				
Free CN	mg/L					0.00007							
Total CN	mg/L				0.002	0.003	0.002	0.002	0.002				
WAD CN	mg/L					0.0001							
CNO	mg/L					0.07							
SCN	mg/L					0.001							
Sulphate	mg/L				3.8	4.7	4.7	4.4	4.4				
Chloride	mg/L				61	64	57	65	65				
Total Ammonia	mg/L				0.005	0.019		0.007	0.007				
Nitrate	mg/L				0.01	0.08		0.01	0.01				
Nitrite	mg/L				0.002	0.012		0.002	0.002				
Alkalinity	mg/L				23	24	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0030	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0181	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.1	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	39	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0019	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0004	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0035	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00001	0.00000	0.00000	0.00000				
Bismuth Bi	mg/L				0.00010	0.00028	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000024	0.0000047	0.0000145	0.0000020	0.0000020				
Calcium Ca	mg/L				8	9	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0004	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0014	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0029	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.1	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.009	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000007	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00026	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0006	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.019	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.6	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.55	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000032	0.0000026	0.0000029	0.0000013	0.0000013				
Sodium Na	mg/L				37	32	34	36	36				
Strontium Sr	mg/L				0.044	0.038	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.051	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000301	0.000300	0.002000	0.002000				
Thorium Th	mg/L					0.000000							
Tin Sn	mg/L					0.00003							
Titanium Ti	mg/L				0.0060	0.0061	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000035	0.000032	0.000034	0.000042	0.000042				
Vanadium V	mg/L				0.0004	0.0001	0.0004	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0019	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0051	0.0050	0.0050	0.0050				

Table H-1-C-2
Scenario 1

Water Quality in Little Roberst Lake Outflow

Date		Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter													
TDS	mg/L				165	150	154	160	178				
TSS	mg/L				7.1	8.0	4.1	5.0	5.1				
Free CN	mg/L				0.00007		0.00007		0.00009				
Total CN	mg/L				0.003	0.002	0.003	0.002	0.003				
WAD CN	mg/L				0.0001		0.0001		0.0001				
CNO	mg/L				0.08		0.08		0.10				
SCN	mg/L				0.001		0.001		0.001				
Sulphate	mg/L				4.9	3.7	5.7	4.4	5.8				
Chloride	mg/L				71	58	66	65	77				
Total Ammonia	mg/L				0.020	0.005	0.014	0.007	0.025				
Nitrate	mg/L				0.09	0.01	0.08	0.01	0.11				
Nitrite	mg/L				0.013	0.002	0.010	0.002	0.015				
Alkalinity	mg/L				24	23	25	25	26				
OrthoPhosphate-P	mg/L				0.0032	0.0010	0.0031	0.0010	0.0037				
Phosphate-P	mg/L				0.0263	0.0160	0.0092	0.0190	0.0219				
Org. Carbon	mg/L				6.1	4.0	7.1	5.0	5.1				
Hardness CaCO3	mg/L				45	38	42	44	46				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0006	0.0017	0.0014	0.0006	0.0009				
Arsenic As	mg/L				0.0005	0.0003	0.0005	0.0004	0.0005				
Barium Ba	mg/L				0.0052	0.0034	0.0045	0.0042	0.0043				
Beryllium Be	mg/L				0.00002	0.00000	0.00001	0.00000	0.00002				
Bismuth Bi	mg/L				0.00029	0.00010	0.00028	0.00010	0.00034				
Boron B	mg/L				0.030	0.020	0.029	0.026	0.027				
Cadmium Cd	mg/L				0.0000032	0.0000040	0.0000153	0.0000020	0.0000030				
Calcium Ca	mg/L				11	7	10	7	11				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0003	0.0003	0.0005	0.0001	0.0003				
Copper Cu	mg/L				0.0013	0.0013	0.0017	0.0018	0.0020				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00010	0.00025	0.00026				
Lithium Li	mg/L				0.0029	0.0028	0.0029	0.0028	0.0029				
Magnesium Mg	mg/L				7.1	5.0	5.3	7.1	7.3				
Manganese Mn	mg/L				0.024	0.008	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000007	0.0000006	0.0000007	0.0000006	0.0000008				
Molybdenum Mo	mg/L				0.00028	0.00016	0.00033	0.00020	0.00032				
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0007				
Phosphorus P	mg/L				0.027	0.016	0.010	0.019	0.023				
Potassium K	mg/L				3.2	2.2	2.6	2.5	3.1				
Selenium Se	mg/L				0.00065	0.00037	0.00083	0.00059	0.00061				
Silicon SiO2	mg/L				0.56	0.50	0.55	0.50	0.57				
Silver Ag	mg/L				0.0000056	0.0000005	0.0000053	0.0000013	0.0000044				
Sodium Na	mg/L				40	31	36	36	39				
Strontium Sr	mg/L				0.045	0.037	0.040	0.045	0.047				
Tellurium Te	mg/L				0.051	0.050	0.051	0.050	0.051				
Thallium Tl	mg/L				0.000101	0.000300	0.000301	0.002000	0.002001				
Thorium Th	mg/L				0.000001		0.000001		0.000001				
Tin Sn	mg/L				0.00003		0.00003		0.00004				
Titanium Ti	mg/L				0.0061	0.0060	0.0061	0.0060	0.0062				
Uranium U	mg/L				0.000036	0.000031	0.000035	0.000042	0.000044				
Vanadium V	mg/L				0.0005	0.0001	0.0005	0.0003	0.0004				
Zinc Zn	mg/L				0.0037	0.0017	0.0018	0.0051	0.0055				
Zirconium Zr	mg/L				0.0051	0.0050	0.0051	0.0050	0.0051				

Table H-1-C-2
Scenario 1

Water Quality in Little Roberst Lake Outflow

Date		Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16
Parameter												
TDS	mg/L				164	150	153	160	160			
TSS	mg/L				7.1	8.0	4.1	5.0	5.0			
Free CN	mg/L				0.00007		0.00007					
Total CN	mg/L				0.003	0.002	0.003	0.002	0.002			
WAD CN	mg/L				0.0001		0.0001					
CNO	mg/L				0.08		0.07					
SCN	mg/L				0.001		0.001					
Sulphate	mg/L				4.8	3.7	5.7	4.4	4.4			
Chloride	mg/L				70	58	66	65	65			
Total Ammonia	mg/L				0.019	0.005	0.013	0.007	0.007			
Nitrate	mg/L				0.08	0.01	0.07	0.01	0.01			
Nitrite	mg/L				0.012	0.002	0.010	0.002	0.002			
Alkalinity	mg/L				24	23	25	25	25			
OrthoPhosphate-P	mg/L				0.0031	0.0010	0.0029	0.0010	0.0010			
Phosphate-P	mg/L				0.0262	0.0160	0.0091	0.0190	0.0190			
Org. Carbon	mg/L				6.1	4.0	7.1	5.0	5.0			
Hardness CaCO3	mg/L				45	38	42	44	44			
Total Metals												
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15			
Antimony Sb	mg/L				0.0006	0.0017	0.0013	0.0006	0.0006			
Arsenic As	mg/L				0.0005	0.0003	0.0005	0.0004	0.0004			
Barium Ba	mg/L				0.0052	0.0034	0.0045	0.0042	0.0042			
Beryllium Be	mg/L				0.00002	0.00000	0.00001	0.00000	0.00000			
Bismuth Bi	mg/L				0.00028	0.00010	0.00027	0.00010	0.00010			
Boron B	mg/L				0.030	0.020	0.029	0.026	0.026			
Cadmium Cd	mg/L				0.0000032	0.0000040	0.0000152	0.0000020	0.0000020			
Calcium Ca	mg/L				11	7	10	7	7			
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000			
Cobalt Co	mg/L				0.0003	0.0003	0.0005	0.0001	0.0001			
Copper Cu	mg/L				0.0013	0.0013	0.0017	0.0018	0.0018			
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16			
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025			
Lithium Li	mg/L				0.0029	0.0028	0.0029	0.0028	0.0028			
Magnesium Mg	mg/L				7.1	5.0	5.3	7.1	7.1			
Manganese Mn	mg/L				0.024	0.008	0.013	0.008	0.008			
Mercury Hg	mg/L				0.0000007	0.0000006	0.0000007	0.0000006	0.0000006			
Molybdenum Mo	mg/L				0.00028	0.00016	0.00033	0.00020	0.00020			
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006			
Phosphorus P	mg/L				0.027	0.016	0.010	0.019	0.019			
Potassium K	mg/L				3.1	2.2	2.6	2.5	2.5			
Selenium Se	mg/L				0.00065	0.00037	0.00083	0.00059	0.00059			
Silicon SiO2	mg/L				0.56	0.50	0.55	0.50	0.50			
Silver Ag	mg/L				0.0000056	0.0000005	0.0000053	0.0000013	0.0000013			
Sodium Na	mg/L				40	31	36	36	36			
Strontium Sr	mg/L				0.045	0.037	0.040	0.045	0.045			
Tellurium Te	mg/L				0.051	0.050	0.051	0.050	0.050			
Thallium Tl	mg/L				0.000101	0.000300	0.000301	0.002000	0.002000			
Thorium Th	mg/L				0.000001		0.000001					
Tin Sn	mg/L				0.00003		0.00003					
Titanium Ti	mg/L				0.0061	0.0060	0.0062	0.0060	0.0060			
Uranium U	mg/L				0.000036	0.000031	0.000035	0.000042	0.000042			
Vanadium V	mg/L				0.0005	0.0001	0.0005	0.0003	0.0003			
Zinc Zn	mg/L				0.0037	0.0017	0.0018	0.0051	0.0051			
Zirconium Zr	mg/L				0.0051	0.0050	0.0051	0.0050	0.0050			

Table H 1-C-3
Scenario 1

Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter												
TDS				140	121	125	145	145				
TSS				4.0	5.9	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN												
Sulphate				2.8	2.7	2.9	3.0	3.0				
Chloride				61	61	59	63	63				
Total Ammonia				0.008	0.011	0.017	0.016	0.016				
Nitrate				0.03	0.03	0.03	0.03	0.03				
Nitrite				0.003	0.003	0.003	0.003	0.003				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca				9	8	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.018	0.024	0.020	0.020				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.51	0.51	0.51	0.51	0.51				
Silver Ag				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000017	0.0000017	0.0000017	0.0000017	0.0000017				
Tin Sn				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 1-C-3
Scenario 1

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter												
TDS				140	121	125	145	145				
TSS				4.0	5.9	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN												
Sulphate				2.8	2.7	2.9	3.0	3.0				
Chloride				61	61	59	63	63				
Total Ammonia				0.008	0.011	0.017	0.016	0.016				
Nitrate				0.03	0.03	0.03	0.03	0.03				
Nitrite				0.003	0.003	0.003	0.003	0.003				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca				9	8	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.018	0.024	0.020	0.020				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.51	0.51	0.51	0.51	0.51				
Silver Ag				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000017	0.0000017	0.0000017	0.0000017	0.0000017				
Tin Sn				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 1-C-3
Scenario 1

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter												
TDS				140	121	125	145	145				
TSS				4.0	5.9	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN												
Sulphate				2.8	2.7	2.9	3.0	3.0				
Chloride				61	61	59	63	63				
Total Ammonia				0.008	0.011	0.017	0.016	0.016				
Nitrate				0.03	0.03	0.03	0.03	0.03				
Nitrite				0.003	0.003	0.003	0.003	0.003				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca				9	8	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.018	0.024	0.020	0.020				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.51	0.51	0.51	0.51	0.51				
Silver Ag				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000017	0.0000017	0.0000017	0.0000017	0.0000017				
Tin Sn				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 1-C-3
Scenario 1

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter												
TDS				140	121	125	145	145				
TSS				4.0	5.9	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN												
Sulphate				2.8	2.7	2.9	3.0	3.0				
Chloride				61	61	59	63	63				
Total Ammonia				0.008	0.011	0.017	0.016	0.016				
Nitrate				0.03	0.03	0.03	0.03	0.03				
Nitrite				0.003	0.003	0.003	0.003	0.003				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca				9	8	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.018	0.024	0.020	0.020				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.51	0.51	0.51	0.51	0.51				
Silver Ag				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000017	0.0000017	0.0000017	0.0000017	0.0000017				
Tin Sn				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 1-C-3
Scenario 1

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter												
TDS				140	121	125	145	145				
TSS				4.0	5.9	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN												
Sulphate				2.8	2.7	2.9	3.0	3.0				
Chloride				61	61	59	63	63				
Total Ammonia				0.008	0.011	0.017	0.016	0.016				
Nitrate				0.03	0.03	0.03	0.03	0.03				
Nitrite				0.003	0.003	0.003	0.003	0.003				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca				9	8	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.018	0.024	0.020	0.020				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.51	0.51	0.51	0.51	0.51				
Silver Ag				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000017	0.0000017	0.0000017	0.0000017	0.0000017				
Tin Sn				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 1-C-3
Scenario 1

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter												
TDS				140	121	125	145	145				
TSS				4.0	5.9	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN												
Sulphate				2.8	2.7	2.8	3.0	3.0				
Chloride				61	61	59	63	63				
Total Ammonia				0.005	0.008	0.014	0.013	0.013				
Nitrate				0.01	0.01	0.01	0.01	0.01				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00000	0.00000	0.00000	0.00000				
Bismuth Bi				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000025	0.0000025	0.0000020	0.0000020	0.0000020				
Calcium Ca				8	8	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.018	0.024	0.020	0.020				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.50	0.50	0.50	0.50	0.50				
Silver Ag				0.0000008	0.0000010	0.0000006	0.0000007	0.0000007				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th												
Tin Sn				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000025	0.000030	0.000038	0.000031	0.000031				
Vanadium V				0.0006	0.0000	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0032	0.0028	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 1-C-3
Scenario 1

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter												
TDS				140	121	125	145	145				
TSS				4.0	5.9	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN												
Sulphate				2.8	2.7	2.8	3.0	3.0				
Chloride				61	61	59	63	63				
Total Ammonia				0.005	0.008	0.014	0.013	0.013				
Nitrate				0.01	0.01	0.01	0.01	0.01				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00000	0.00000	0.00000	0.00000				
Bismuth Bi				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000025	0.0000025	0.0000020	0.0000020	0.0000020				
Calcium Ca				8	8	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.018	0.024	0.020	0.020				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.50	0.50	0.50	0.50	0.50				
Silver Ag				0.0000008	0.0000010	0.0000006	0.0000007	0.0000007				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th												
Tin Sn				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000025	0.000030	0.000038	0.000031	0.000031				
Vanadium V				0.0006	0.0000	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0032	0.0028	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 1-C-3
Scenario 1

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter												
TDS				140	135	125	145	145				
TSS				4.0	5.8	6.0	7.0	7.0				
Free CN					0.00013							
Total CN				0.002	0.003	0.002	0.002	0.002				
WAD CN					0.0002							
CNO					0.15							
SCN					0.002							
Sulphate				2.8	4.6	2.8	3.0	3.0				
Chloride				61	70	59	63	63				
Total Ammonia				0.005	0.035	0.014	0.013	0.013				
Nitrate				0.01	0.16	0.01	0.01	0.01				
Nitrite				0.0020	0.0212	0.002	0.002	0.002				
Alkalinity				28	26	27	27	27				
OrthoPhosphate-P				0.0008	0.0047	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0213	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	44	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0012	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0005	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0033	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00002	0.00000	0.00000	0.00000				
Bismuth Bi				0.00003	0.00037	0.00003	0.00003	0.00003				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000025	0.0000038	0.0000020	0.0000020	0.0000020				
Calcium Ca				8	13	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0003	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0017	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00002	0.00007	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0029	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000006	0.0000007	0.0000006	0.0000006	0.0000006				
Molybdenum Mo				0.00016	0.00033	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0007	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.023	0.024	0.020	0.020				
Potassium K				2.8	3.2	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.50	0.58	0.50	0.50	0.50				
Silver Ag				0.0000008	0.0000052	0.0000006	0.0000007	0.0000007				
Sodium Na				39	34	34	32	32				
Strontium Sr				0.041	0.043	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th					0.0000010							
Tin Sn				0.00040	0.00044	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000025	0.000031	0.000038	0.000031	0.000031				
Vanadium V				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0036	0.0028	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 1-C-3
Scenario 1

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

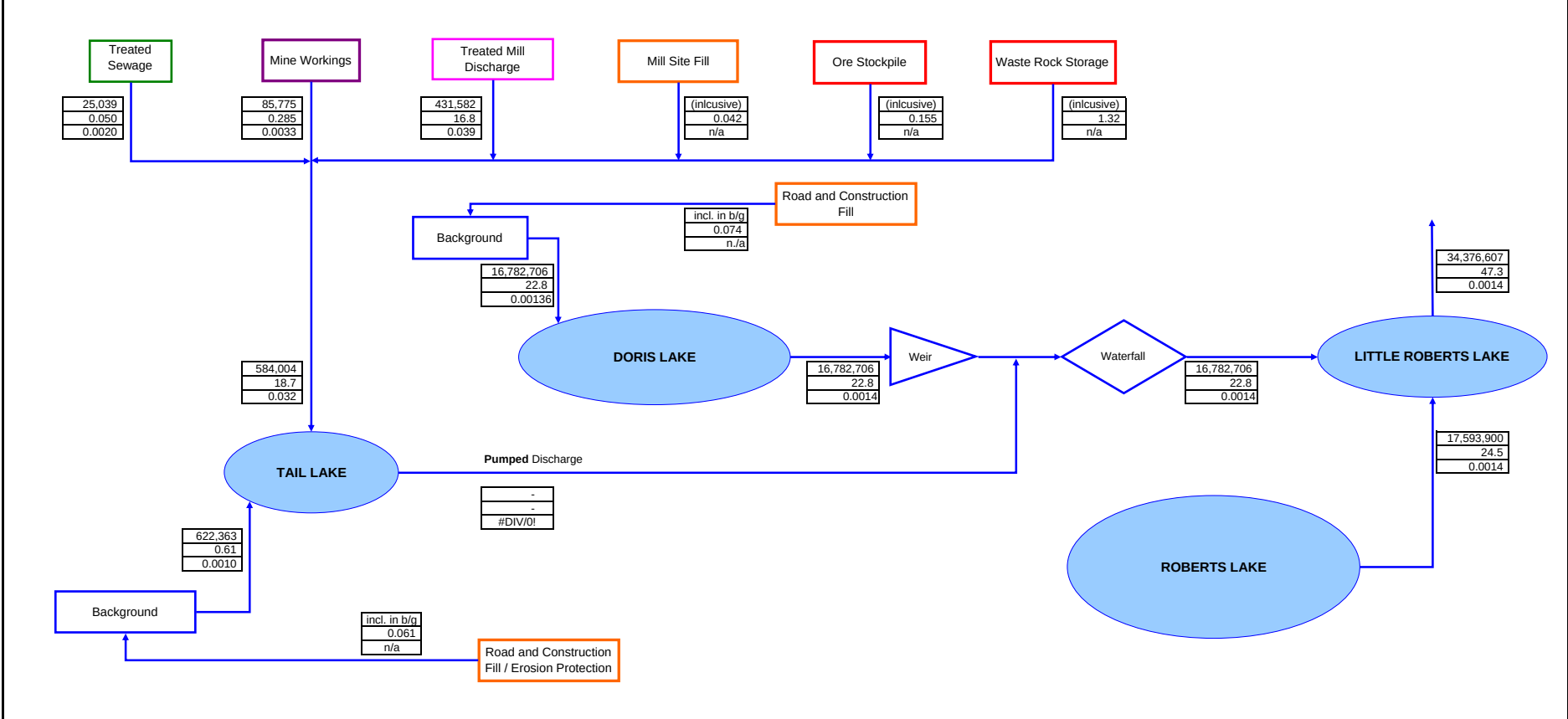
Date	Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter												
TDS				163	121	147	145	172				
TSS				4.0	5.9	5.9	7.0	6.8				
Free CN				0.00014		0.00014		0.00017				
Total CN				0.003	0.002	0.003	0.002	0.004				
WAD CN				0.0002		0.0002		0.0002				
CNO				0.16		0.15		0.19				
SCN				0.002		0.002		0.003				
Sulphate				4.9	2.7	4.8	3.0	5.5				
Chloride				76	61	74	63	82				
Total Ammonia				0.034	0.008	0.041	0.013	0.048				
Nitrate				0.17	0.01	0.16	0.01	0.20				
Nitrite				0.023	0.002	0.022	0.002	0.027				
Alkalinity				28	25	28	27	27				
OrthoPhosphate-P				0.0050	0.0008	0.0048	0.0008	0.0059				
Phosphate-P				0.0203	0.0179	0.0273	0.0195	0.0239				
Org. Carbon				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3				47	43	44	44	45				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0007	0.0008	0.0031	0.0005	0.0009				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0030	0.0032	0.0031	0.0031	0.0033				
Beryllium Be				0.00002	0.00000	0.00002	0.00000	0.00003				
Bismuth Bi				0.00040	0.00003	0.00038	0.00003	0.00048				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000039	0.0000025	0.0000034	0.0000020	0.0000038				
Calcium Ca				14	8	13	7	14				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0003	0.0001	0.0011	0.0001	0.0004				
Copper Cu				0.0014	0.0015	0.0014	0.0015	0.0017				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00003	0.00006	0.00005	0.00004	0.00005				
Lithium Li				0.0029	0.0028	0.0029	0.0028	0.0029				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000008	0.0000006	0.0000008	0.0000006	0.0000009				
Molybdenum Mo				0.00035	0.00015	0.00036	0.00016	0.00039				
Nickel Ni				0.0006	0.0006	0.0006	0.0004	0.0007				
Phosphorus P				0.022	0.018	0.029	0.020	0.026				
Potassium K				3.6	2.4	3.2	2.3	3.4				
Selenium Se				0.00088	0.00057	0.00061	0.00056	0.00056				
Silicon SiO2				0.59	0.50	0.59	0.50	0.61				
Silver Ag				0.0000054	0.0000010	0.0000053	0.0000007	0.0000067				
Sodium Na				43	33	38	32	37				
Strontium Sr				0.041	0.042	0.037	0.040	0.041				
Tellurium Te				0.049	0.050	0.050	0.050	0.049				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000011		0.0000012		0.0000016				
Tin Sn				0.00045	0.00040	0.00044	0.00040	0.00046				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000030	0.000039	0.000031	0.000033				
Vanadium V				0.0006	0.0000	0.0003	0.0001	0.0003				
Zinc Zn				0.0014	0.0032	0.0033	0.0017	0.0023				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 1-C-3
Scenario 1

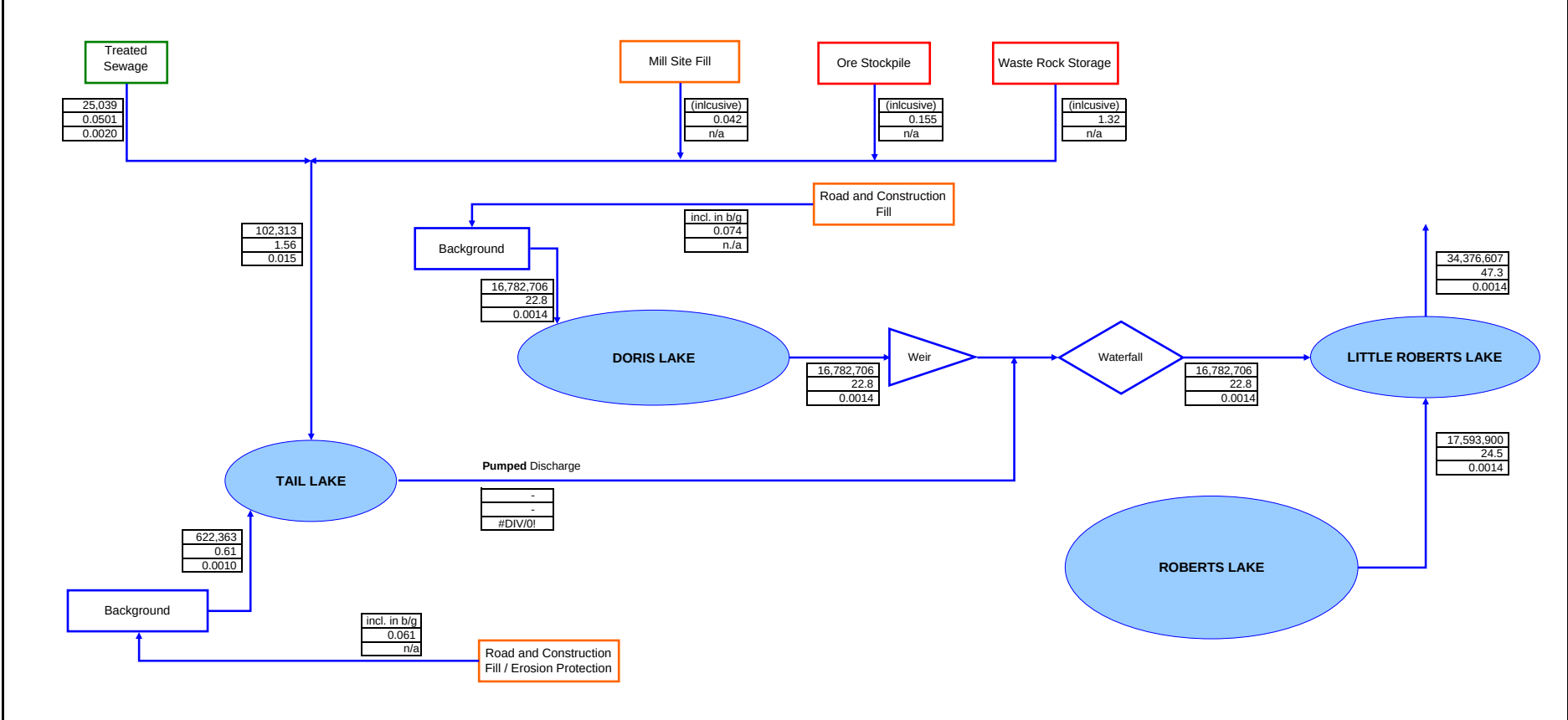
Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16	Year 10 Jan-17
Parameter												
TDS				161	121	146	145	145				
TSS				4.0	5.9	5.9	7.0	7.0				
Free CN				0.00013		0.00013						
Total CN				0.003	0.002	0.003	0.002	0.002				
WAD CN				0.0002		0.0002						
CNO				0.15		0.14						
SCN				0.002		0.002						
Sulphate				4.7	2.7	4.7	3.0	3.0				
Chloride				76	61	73	63	63				
Total Ammonia				0.032	0.008	0.039	0.013	0.013				
Nitrate				0.16	0.01	0.15	0.01	0.01				
Nitrite				0.022	0.002	0.021	0.002	0.002				
Alkalinity				28	25	28	27	27				
OrthoPhosphate-P				0.0047	0.0008	0.0045	0.0008	0.0008				
Phosphate-P				0.0200	0.0179	0.0271	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3				47	43	44	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0007	0.0008	0.0031	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0030	0.0032	0.0031	0.0031	0.0031				
Beryllium Be				0.00002	0.00000	0.00002	0.00000	0.00000				
Bismuth Bi				0.00038	0.00003	0.00036	0.00003	0.00003				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000039	0.0000025	0.0000033	0.0000020	0.0000020				
Calcium Ca				14	8	13	7	7				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0003	0.0001	0.0011	0.0001	0.0001				
Copper Cu				0.0014	0.0015	0.0014	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00003	0.00006	0.00005	0.00004	0.00004				
Lithium Li				0.0029	0.0028	0.0029	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000008	0.0000006	0.0000008	0.0000006	0.0000006				
Molybdenum Mo				0.00034	0.00015	0.00035	0.00016	0.00016				
Nickel Ni				0.0006	0.0006	0.0006	0.0004	0.0004				
Phosphorus P				0.022	0.018	0.029	0.020	0.020				
Potassium K				3.6	2.4	3.2	2.3	2.3				
Selenium Se				0.00088	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.59	0.50	0.58	0.50	0.50				
Silver Ag				0.0000055	0.0000010	0.0000053	0.0000007	0.0000007				
Sodium Na				43	33	38	32	32				
Strontium Sr				0.041	0.042	0.037	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000012		0.0000013						
Tin Sn				0.00044	0.00040	0.00044	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0061	0.0060	0.0060				
Uranium U				0.000026	0.000030	0.000039	0.000031	0.000031				
Vanadium V				0.0006	0.0000	0.0003	0.0001	0.0001				
Zinc Zn				0.0014	0.0032	0.0032	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

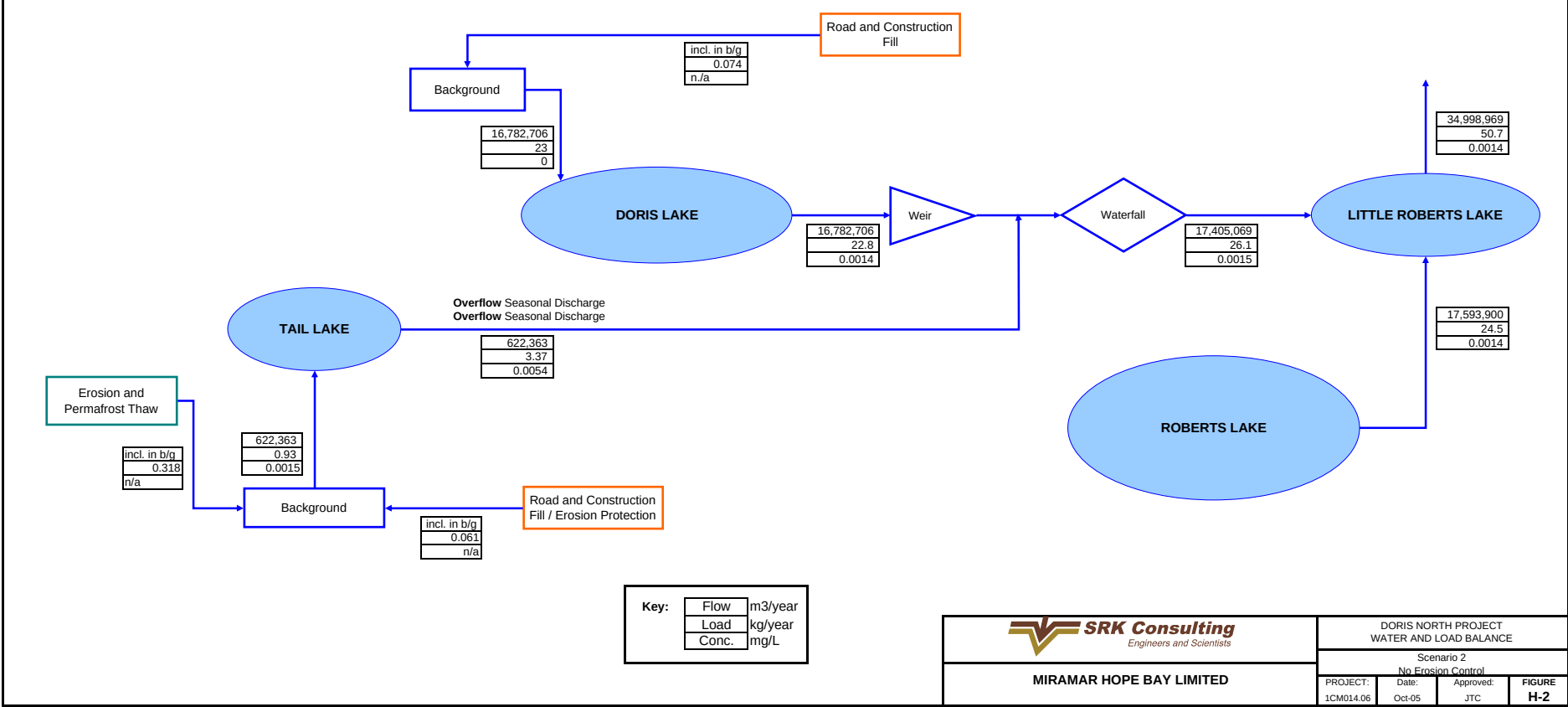
Scenario 2 - OPERATIONAL CONDITIONS
Year 2



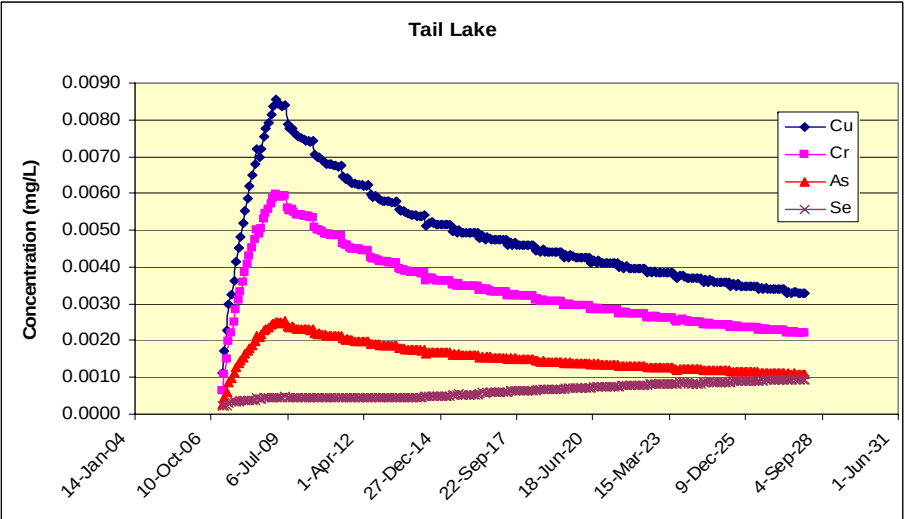
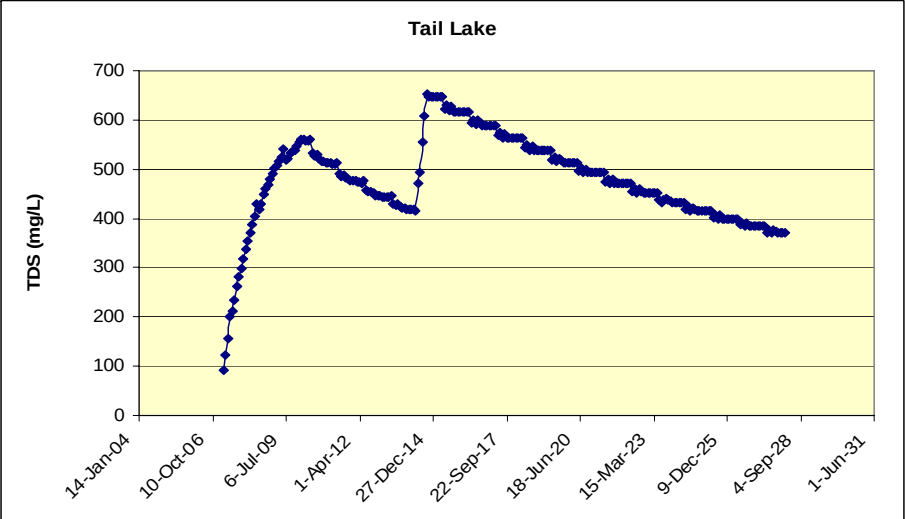
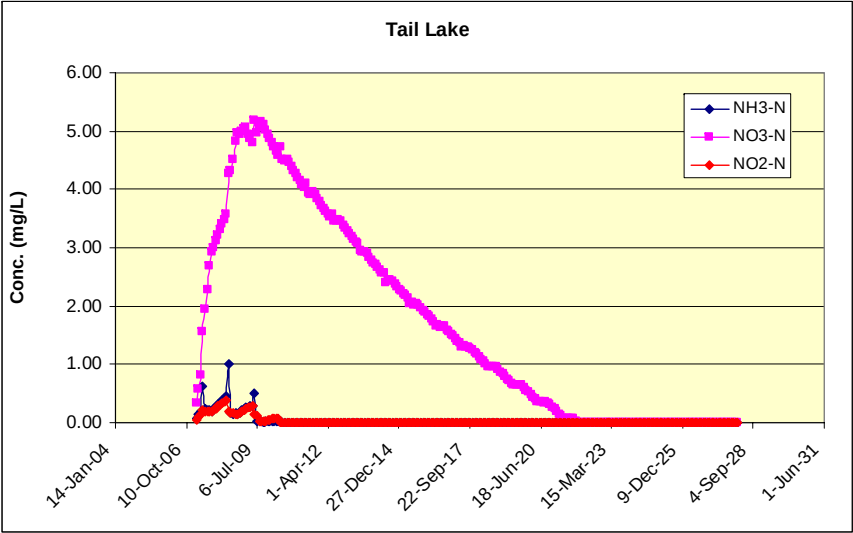
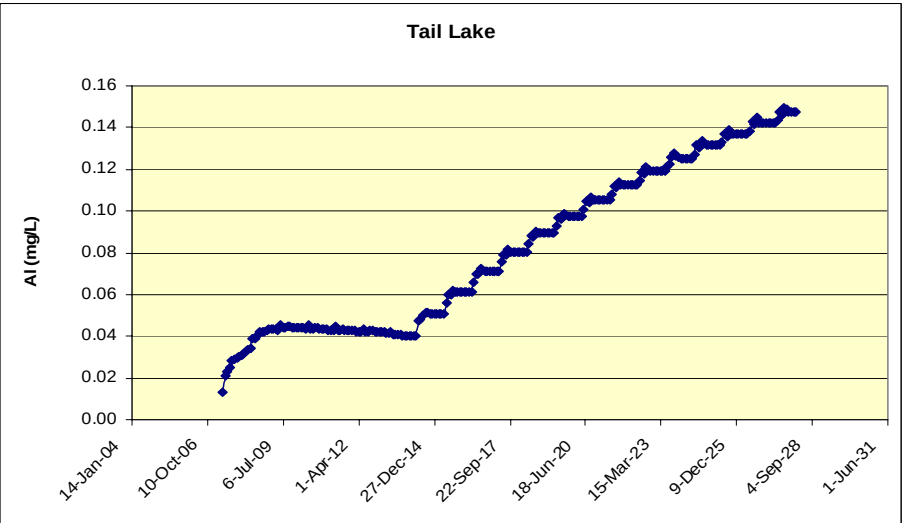
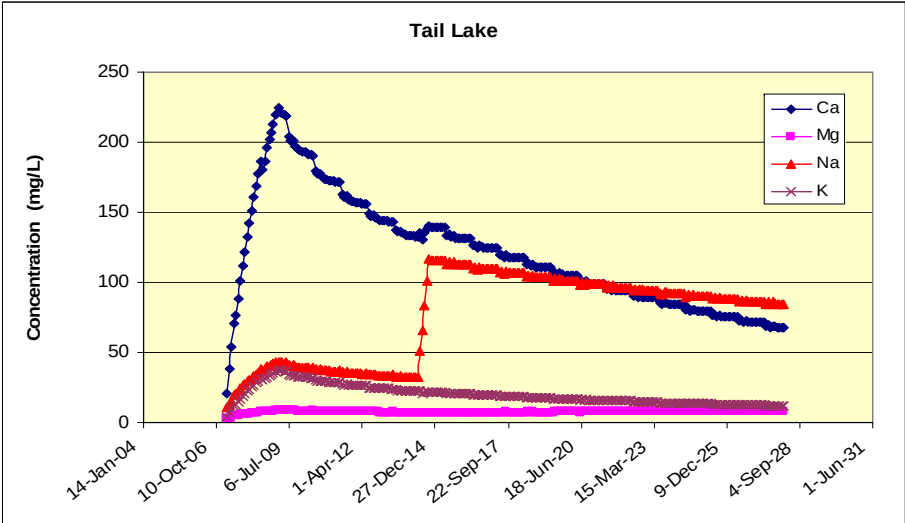
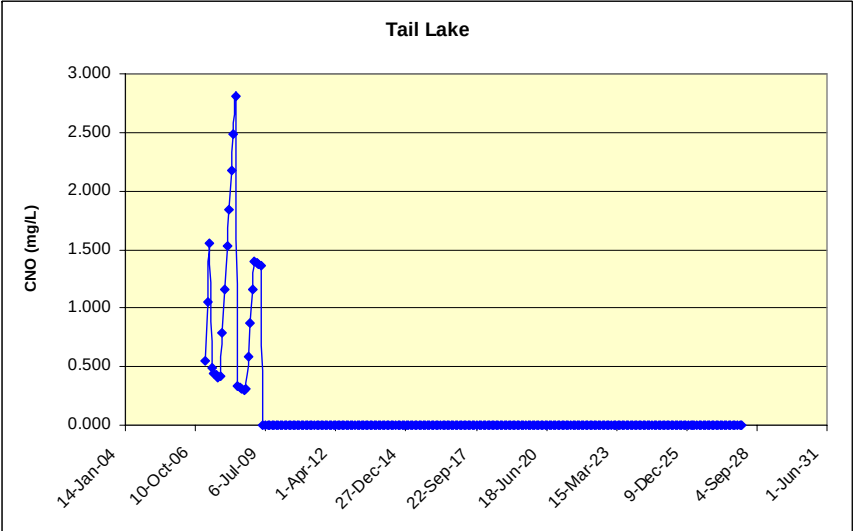
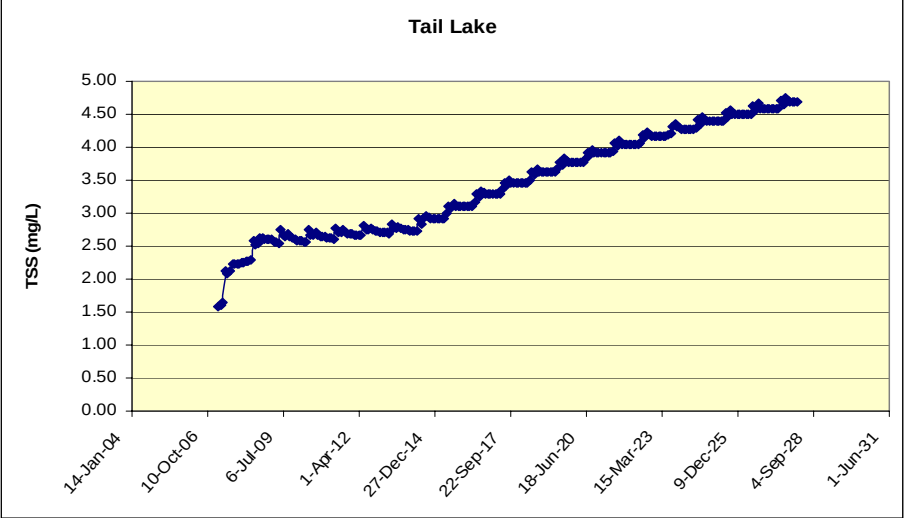
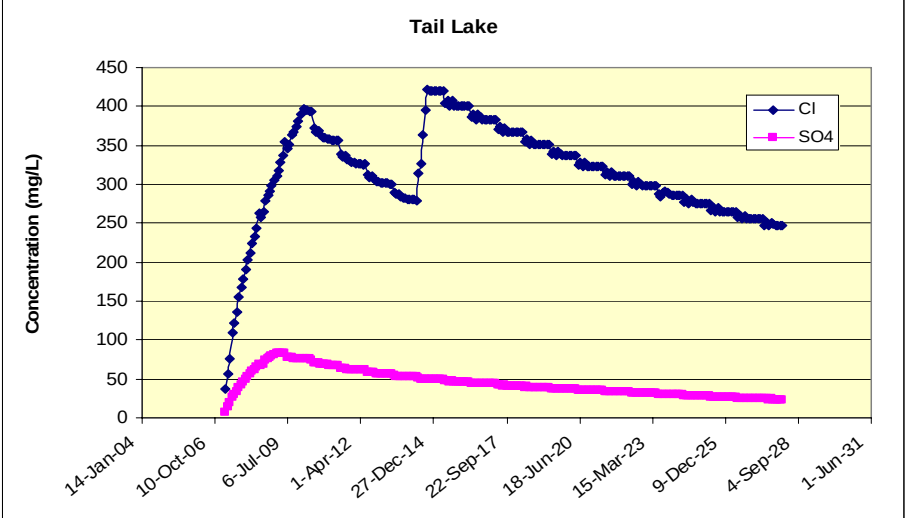
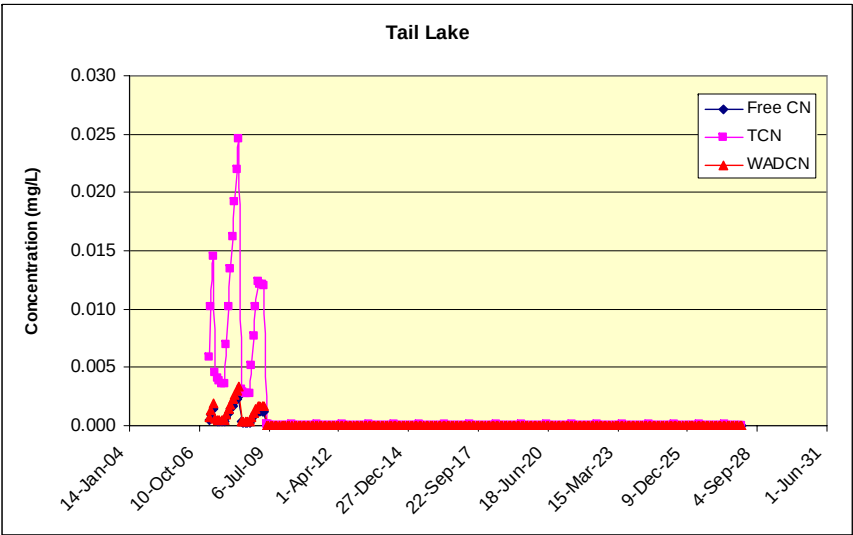
POST MILLING OPERATIONAL CONDITIONS
Year 3



POST CLOSURE CONDITIONS
Year 8



Scenario2



Scenario 2

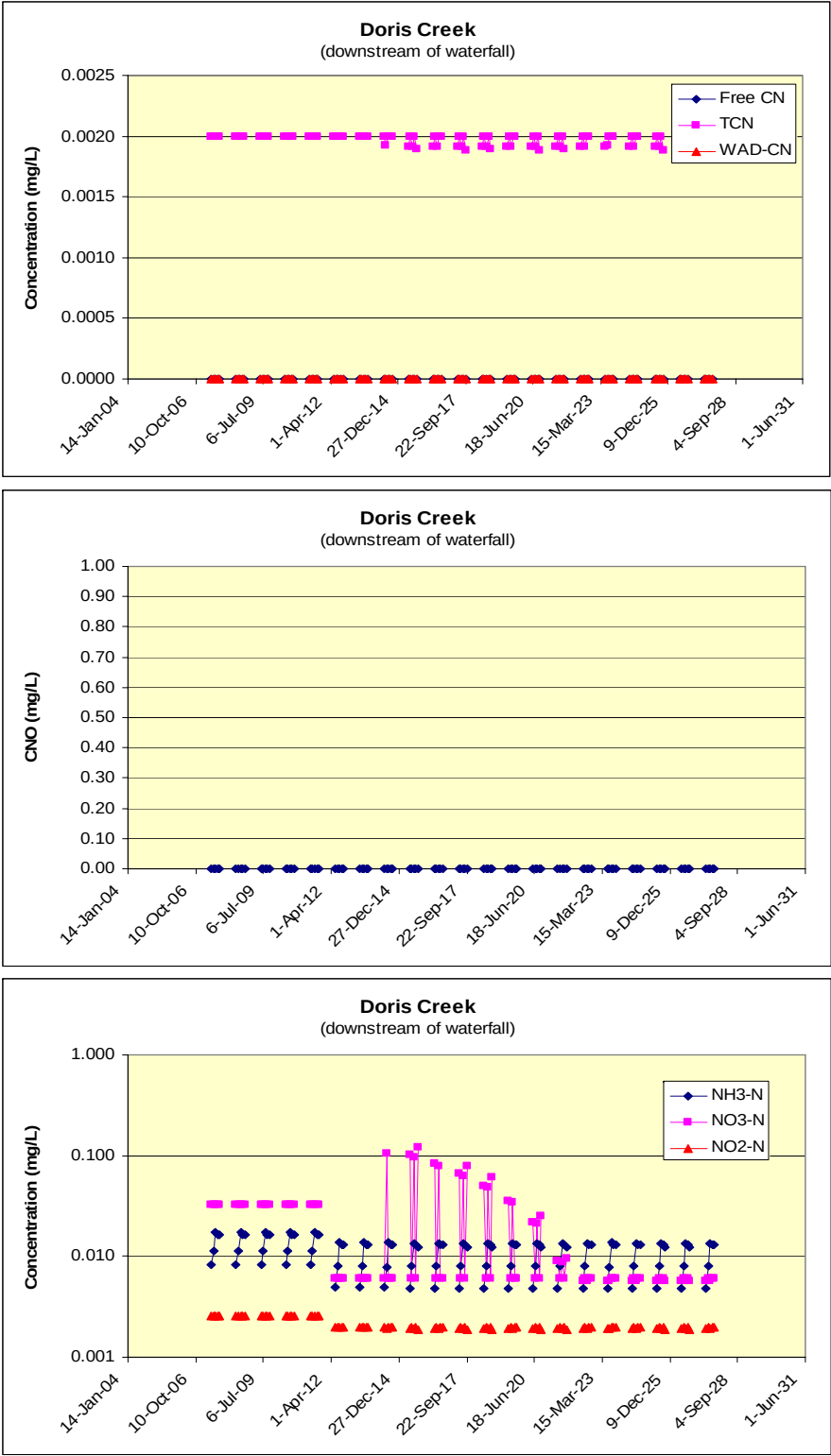


Table H-2-A-1
Scenario 2

OUTPUT SUMMARY							Fraction of CCME in Doris Creek (%)
Discharge rate		m ³ /year					
Degradation Field(age)		Tail Lk Cu < CME Year		35			
Maximum Concentration		MMER	CCME	Tail Lake Year 2	Doris Creek Year 9	L'Roberts L Year 9	
pH			6 to 9	7 to 8	7 to 8	7 to 8	
TDS	mg/L			652	172	178	
TSS	mg/L			4.8	7.0	8.1	
Free CN	mg/L		0.005	0.0025			
Total CN	mg/L	1.0		0.025	0.002	0.002	
WAD CN	mg/L			0.0034			
CNO	mg/L			2.8			
SCN	mg/L			0.090	0.003	0.001	
Sulphate	mg/L			83	5.5	5.8	
Chloride	mg/L			422	82	77	
Total Ammonia	mg/L		0.97	1.01	0.017	0.009	2%
Nitrate	mg/L		2.9	5.2	0.12	0.07	4%
Nitrite	mg/L		0.018	0.39	0.003	0.002	14%
Alkalinity	mg/L			52	28	26	
OrthoPhosphate-P	mg/L			0.1504	0.0059	0.0037	
Phosphate-P	mg/L			0.1537	0.0273	0.0263	
Org. Carbon	mg/L			6.4	7.5	7.1	
Hardness CaCO3	mg/L			100	47	46	
Total Metals							
Aluminum Al	mg/L		0.1	0.15	0.08	0.25	84%
Antimony Sb	mg/L			0.0138	0.0031	0.0019	
Arsenic As	mg/L	0.5	0.005	0.00	0.0005	0.0005	10%
Barium Ba	mg/L			0.0097	0.0033	0.0052	
Beryllium Be	mg/L			0.00056	0.00003	0.00002	
Bismuth Bi	mg/L			0.01323	0.00048	0.00034	
Boron B	mg/L			0.035	0.035	0.030	
Cadmium Cd	mg/L		0.000038	0.000051	0.0000039	0.0000153	10%
Calcium Ca	mg/L			225	14	11	
Chromium Cr	mg/L		0.001	0.0060	0.0008	0.001	77%
Cobalt Co	mg/L			0.0094	0.0011	0.0005	
Copper Cu	mg/L	0.3	0.002	0.009	0.00170	0.0020	85%
Iron Fe	mg/L		0.3	0.17	0.13	0.28	42%
Lead Pb	mg/L	0.2	0.002	0.00038	0.00007	0.00026	3%
Lithium Li	mg/L			0.0054	0.0029	0.0029	
Magnesium Mg	mg/L			8.8	7.3	7.3	
Manganese Mn	mg/L			0.026	0.021	0.024	
Mercury Hg	mg/L		0.0001	0.0000116	0.00000120	0.0000009	1%
Molybdenum Mo	mg/L		0.073	0.0081	0.00039	0.00033	1%
Nickel Ni	mg/L	0.5	0.025	0.008	0.0007	0.0007	3%
Phosphorus P	mg/L			0.227	0.029	0.027	
Potassium K	mg/L			37	3.6	3.2	
Selenium Se	mg/L		0.001	0.00096	0.0009	0.00084	90%
Silicon SiO2	mg/L			3.6	0.61	0.57	
Silver Ag	mg/L		0.0001	0.00011	0.0000068	0.0000056	7%
Sodium Na	mg/L			117	43	40	
Strontium Sr	mg/L			0.081	0.043	0.047	
Tellurium Te	mg/L			0.052	0.050	0.052	
Thallium Tl	mg/L		0.0008	0.000041	0.000031	0.0020	4%
Thorium Th	mg/L			0.000044	0.0000025	0.0000013	
Tin Sn	mg/L			0.00209	0.00046	0.00004	
Titanium Ti	mg/L			0.0133	0.0064	0.0064	
Uranium U	mg/L			0.000077	0.000039	0.000044	
Vanadium V	mg/L			0.0031	0.0006	0.0005	
Zinc Zn	mg/L	0.5	0.03	0.021	0.0036	0.0055	12%
Zirconium Zr	mg/L			0.0055	0.0050	0.0052	

Table H-2-A-2
Scenario 2

Water Quality in TAIL LAKE

Date		Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter													
TDS	mg/L	92	124	156	201	212	233	261	281	298	318	337	353
TSS	mg/L	1.6	1.6	1.6	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3
Free CN	mg/L	0.00050	0.00096	0.00141	0.00044	0.00040	0.00039	0.00037	0.00037	0.00072	0.00106	0.00139	0.00167
Total CN	mg/L	0.006	0.010	0.015	0.005	0.004	0.004	0.004	0.004	0.007	0.010	0.013	0.016
WAD CN	mg/L	0.0007	0.0013	0.0019	0.0006	0.0005	0.0005	0.0005	0.0005	0.0010	0.0014	0.0018	0.0022
CNO	mg/L	0.55	1.06	1.55	0.49	0.44	0.43	0.41	0.41	0.79	1.16	1.53	1.84
SCN	mg/L	0.008	0.014	0.021	0.027	0.030	0.034	0.040	0.044	0.048	0.052	0.056	0.060
Sulphate	mg/L	7.5	13.4	19.3	26.4	29.2	33.5	38.6	42.4	45.6	49.2	52.7	55.7
Chloride	mg/L	37	57	77	109	121	136	155	168	179	191	202	212
Total Ammonia	mg/L	0.070	0.133	0.194	0.633	0.230	0.210	0.211	0.191	0.233	0.276	0.318	0.354
Nitrate	mg/L	0.35	0.58	0.80	1.57	1.94	2.27	2.68	2.94	3.01	3.12	3.22	3.30
Nitrite	mg/L	0.054	0.102	0.150	0.222	0.200	0.192	0.191	0.187	0.218	0.251	0.283	0.310
Alkalinity	mg/L	16	18	21	27	28	29	32	33	35	36	37	39
OrthoPhosphate-P	mg/L	0.0107	0.0195	0.0282	0.0364	0.0395	0.0455	0.0523	0.0579	0.0629	0.0684	0.0737	0.0783
Phosphate-P	mg/L	0.0142	0.0229	0.0315	0.0406	0.0434	0.0492	0.0561	0.0615	0.0664	0.0718	0.0771	0.0816
Org. Carbon	mg/L	3.0	2.9	2.8	3.6	3.6	3.5	3.6	3.5	3.4	3.3	3.3	3.2
Hardness CaCO3	mg/L	23	29	35	45	47	51	57	60	63	66	70	73
Total Metals													
Aluminum Al	mg/L	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Antimony Sb	mg/L	0.0007	0.0012	0.0018	0.0037	0.0045	0.0051	0.0059	0.0063	0.0065	0.0068	0.0070	0.0073
Arsenic As	mg/L	0.0003	0.0004	0.0006	0.0009	0.0010	0.0011	0.0013	0.0014	0.0014	0.0015	0.0016	0.0017
Barium Ba	mg/L	0.0015	0.0022	0.0028	0.0037	0.0039	0.0044	0.0049	0.0053	0.0057	0.0061	0.0064	0.0067
Beryllium Be	mg/L	0.00012	0.00014	0.00016	0.00025	0.00027	0.00029	0.00032	0.00033	0.00033	0.00034	0.00035	0.00036
Bismuth Bi	mg/L	0.00057	0.00108	0.00159	0.00346	0.00423	0.00480	0.00557	0.00594	0.00614	0.00640	0.00666	0.00687
Boron B	mg/L	0.007	0.008	0.009	0.013	0.014	0.015	0.017	0.017	0.018	0.018	0.019	0.019
Cadmium Cd	mg/L	0.0000044	0.0000075	0.0000105	0.0000171	0.0000196	0.0000222	0.0000256	0.0000277	0.0000292	0.0000309	0.0000326	0.0000341
Calcium Ca	mg/L	21	38	54	71	77	88	101	112	121	132	142	151
Chromium Cr	mg/L	0.001	0.001	0.001	0.002	0.002	0.002	0.003	0.003	0.003	0.004	0.004	0.004
Cobalt Co	mg/L	0.0008	0.0015	0.0022	0.0029	0.0032	0.0037	0.0042	0.0047	0.0051	0.0055	0.0059	0.0063
Copper Cu	mg/L	0.0011	0.0017	0.0023	0.0030	0.0032	0.0036	0.0041	0.0045	0.0048	0.0052	0.0055	0.0058
Iron Fe	mg/L	0.02	0.02	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Lead Pb	mg/L	0.00005	0.00007	0.00009	0.00014	0.00016	0.00018	0.00020	0.00021	0.00022	0.00023	0.00024	0.00025
Lithium Li	mg/L	0.0019	0.0020	0.0022	0.0029	0.0029	0.0031	0.0033	0.0034	0.0034	0.0035	0.0035	0.0036
Magnesium Mg	mg/L	2.5	2.9	3.3	4.4	4.6	4.9	5.4	5.6	5.8	6.0	6.2	6.4
Manganese Mn	mg/L	0.002	0.004	0.006	0.008	0.009	0.010	0.012	0.013	0.014	0.015	0.016	0.017
Mercury Hg	mg/L	0.0000006	0.0000010	0.0000013	0.0000019	0.0000022	0.0000024	0.0000028	0.0000030	0.0000031	0.0000033	0.0000034	0.0000036
Molybdenum Mo	mg/L	0.00072	0.00134	0.00194	0.00252	0.00275	0.00316	0.00364	0.00403	0.00437	0.00476	0.00513	0.00545
Nickel Ni	mg/L	0.0008	0.0013	0.0019	0.0026	0.0028	0.0032	0.0036	0.0039	0.0042	0.0045	0.0048	0.0051
Phosphorus P	mg/L	0.020	0.033	0.047	0.065	0.071	0.081	0.093	0.102	0.109	0.117	0.126	0.133
Potassium K	mg/L	3.8	6.6	9.3	12.1	13.1	14.9	17.1	18.9	20.4	22.1	23.8	25.2
Selenium Se	mg/L	0.00022	0.00023	0.00024	0.00032	0.00032	0.00033	0.00035	0.00035	0.00035	0.00036	0.00036	0.00037
Silicon SiO2	mg/L	0.70	0.92	1.14	1.51	1.59	1.75	1.96	2.09	2.20	2.33	2.46	2.57
Silver Ag	mg/L	0.0000525	0.0000537	0.0000548	0.0000782	0.0000802	0.0000807	0.0000842	0.0000843	0.0000835	0.0000836	0.0000838	0.0000838
Sodium Na	mg/L	11	13	16	20	21	23	25	26	28	29	30	32
Strontium Sr	mg/L	0.017	0.021	0.026	0.034	0.036	0.040	0.044	0.047	0.050	0.053	0.055	0.058
Tellurium Te	mg/L	0.025	0.024	0.024	0.030	0.029	0.029	0.030	0.029	0.028	0.028	0.027	0.027
Thallium Tl	mg/L	0.000017	0.000018	0.000019	0.000026	0.000026	0.000027	0.000029	0.000030	0.000030	0.000031	0.000031	0.000032
Thorium Th	mg/L				0.000007	0.000010	0.000011	0.000013	0.000013	0.000013	0.000013	0.000012	0.000012
Tin Sn	mg/L	0.00013	0.00021	0.00028	0.00058	0.00071	0.00080	0.00093	0.00098	0.00101	0.00104	0.00108	0.00111
Titanium Ti	mg/L	0.0030	0.0030	0.0029	0.0039	0.0038	0.0038	0.0040	0.0039	0.0038	0.0038	0.0037	0.0037
Uranium U	mg/L	0.000025	0.000025	0.000024	0.000038	0.000040	0.000040	0.000042	0.000042	0.000040	0.000040	0.000039	0.000038
Vanadium V	mg/L	0.0004	0.0006	0.0007	0.0011	0.0013	0.0014	0.0016	0.0017	0.0017	0.0018	0.0019	0.0020
Zinc Zn	mg/L	0.0020	0.0034	0.0049	0.0066	0.0072	0.0083	0.0097	0.0106	0.0114	0.0123	0.0132	0.0139
Zirconium Zr	mg/L	0.0025	0.0024	0.0023	0.0032	0.0031	0.0031	0.0032	0.0032	0.0031	0.0030	0.0029	0.0029

Table H-2-A-2
Scenario 2

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter													
TDS	mg/L	372	388	405	430	418	429	450	460	468	480	491	501
TSS	mg/L	2.3	2.3	2.3	2.6	2.5	2.5	2.6	2.6	2.6	2.6	2.6	2.6
Free CN	mg/L	0.00198	0.00226	0.00255	0.00031	0.00029	0.00029	0.00028	0.00028	0.00054	0.00080	0.00105	0.00127
Total CN	mg/L	0.019	0.022	0.025	0.003	0.003	0.003	0.003	0.003	0.005	0.008	0.010	0.012
WAD CN	mg/L	0.0026	0.0030	0.0034	0.0004	0.0004	0.0004	0.0004	0.0004	0.0007	0.0011	0.0014	0.0017
CNO	mg/L	2.18	2.49	2.80	0.34	0.32	0.32	0.30	0.31	0.59	0.88	1.16	1.40
SCN	mg/L	0.064	0.067	0.071	0.074	0.072	0.074	0.078	0.080	0.082	0.085	0.088	0.090
Sulphate	mg/L	59.1	62.1	65.2	69.2	67.5	69.7	73.3	75.3	76.9	79.1	81.2	83.1
Chloride	mg/L	223	233	243	262	257	265	279	286	291	298	305	310
Total Ammonia	mg/L	0.394	0.430	0.466	1.015	0.165	0.155	0.156	0.143	0.175	0.209	0.241	0.270
Nitrate	mg/L	3.40	3.49	3.58	4.28	4.33	4.52	4.82	4.96	4.96	5.00	5.04	5.06
Nitrite	mg/L	0.340	0.368	0.395	0.190	0.161	0.156	0.156	0.153	0.177	0.202	0.227	0.249
Alkalinity	mg/L	40	41	43	46	45	46	48	49	49	50	51	52
OrthoPhosphate-P	mg/L	0.0834	0.0880	0.0926	0.0969	0.0939	0.0969	0.1019	0.1048	0.1073	0.1107	0.1140	0.1168
Phosphate-P	mg/L	0.0866	0.0911	0.0957	0.1006	0.0974	0.1004	0.1053	0.1082	0.1106	0.1139	0.1172	0.1200
Org. Carbon	mg/L	3.1	3.1	3.0	3.5	3.5	3.5	3.6	3.5	3.4	3.4	3.3	3.2
Hardness CaCO3	mg/L	76	79	82	87	85	87	91	93	94	97	99	100
Total Metals													
Aluminum Al	mg/L	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0076	0.0078	0.0080	0.0092	0.0093	0.0096	0.0102	0.0104	0.0105	0.0106	0.0108	0.0109
Arsenic As	mg/L	0.0018	0.0019	0.0020	0.0021	0.0021	0.0022	0.0023	0.0023	0.0024	0.0024	0.0025	0.0025
Barium Ba	mg/L	0.0071	0.0074	0.0077	0.0082	0.0080	0.0083	0.0087	0.0089	0.0090	0.0093	0.0095	0.0097
Beryllium Be	mg/L	0.00037	0.00037	0.00038	0.00044	0.00044	0.00045	0.00047	0.00047	0.00047	0.00048	0.00048	0.00048
Bismuth Bi	mg/L	0.00712	0.00734	0.00756	0.00874	0.00883	0.00914	0.00970	0.00988	0.00993	0.01006	0.01019	0.01030
Boron B	mg/L	0.020	0.020	0.021	0.023	0.023	0.023	0.025	0.025	0.025	0.025	0.025	0.026
Cadmium Cd	mg/L	0.0000358	0.0000373	0.0000387	0.0000427	0.0000423	0.0000437	0.0000461	0.0000472	0.0000478	0.0000488	0.0000498	0.0000506
Calcium Ca	mg/L	160	169	178	186	181	187	196	202	207	213	219	225
Chromium Cr	mg/L	0.004	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.006	0.006	0.006
Cobalt Co	mg/L	0.0067	0.0070	0.0074	0.0078	0.0076	0.0078	0.0082	0.0084	0.0086	0.0089	0.0092	0.0094
Copper Cu	mg/L	0.0062	0.0065	0.0068	0.0072	0.0070	0.0072	0.0076	0.0078	0.0079	0.0081	0.0083	0.0085
Iron Fe	mg/L	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00026	0.00027	0.00028	0.00031	0.00031	0.00032	0.00034	0.00034	0.00035	0.00035	0.00036	0.00036
Lithium Li	mg/L	0.0037	0.0037	0.0038	0.0043	0.0042	0.0042	0.0044	0.0044	0.0044	0.0045	0.0045	0.0045
Magnesium Mg	mg/L	6.6	6.8	7.0	7.7	7.5	7.7	8.0	8.2	8.2	8.3	8.5	8.6
Manganese Mn	mg/L	0.018	0.019	0.020	0.022	0.021	0.022	0.023	0.023	0.024	0.025	0.025	0.026
Mercury Hg	mg/L	0.0000038	0.0000039	0.0000041	0.0000045	0.0000044	0.0000045	0.0000048	0.0000049	0.0000050	0.0000051	0.0000052	0.0000052
Molybdenum Mo	mg/L	0.00580	0.00612	0.00644	0.00674	0.00654	0.00675	0.00710	0.00730	0.00748	0.00771	0.00794	0.00814
Nickel Ni	mg/L	0.0054	0.0057	0.0059	0.0063	0.0062	0.0064	0.0067	0.0069	0.0070	0.0072	0.0074	0.0075
Phosphorus P	mg/L	0.140	0.147	0.154	0.164	0.160	0.166	0.174	0.179	0.182	0.187	0.192	0.196
Potassium K	mg/L	26.8	28.3	29.7	31.2	30.2	31.2	32.7	33.7	34.4	35.5	36.5	37.4
Selenium Se	mg/L	0.00037	0.00037	0.00038	0.00043	0.00042	0.00043	0.00044	0.00044	0.00044	0.00044	0.00044	0.00045
Silicon SiO2	mg/L	2.70	2.80	2.91	3.13	3.05	3.14	3.28	3.35	3.40	3.48	3.56	3.62
Silver Ag	mg/L	0.0000841	0.0000842	0.0000844	0.0000995	0.0000993	0.0000994	0.0001021	0.0001017	0.0001006	0.0001004	0.0001002	0.0001000
Sodium Na	mg/L	33	34	35	38	37	38	40	40	41	42	43	43
Strontium Sr	mg/L	0.061	0.063	0.066	0.070	0.068	0.070	0.074	0.075	0.076	0.078	0.080	0.081
Tellurium Te	mg/L	0.026	0.026	0.025	0.029	0.029	0.029	0.029	0.029	0.028	0.028	0.027	0.027
Thallium Tl	mg/L	0.000032	0.000033	0.000033	0.000037	0.000037	0.000037	0.000039	0.000039	0.000039	0.000039	0.000040	0.000040
Thorium Th	mg/L	0.000012	0.000012	0.000011	0.000016	0.000017	0.000018	0.000020	0.000020	0.000019	0.000019	0.000018	0.000018
Tin Sn	mg/L	0.00115	0.00118	0.00121	0.00140	0.00142	0.00147	0.00156	0.00159	0.00159	0.00161	0.00162	0.00164
Titanium Ti	mg/L	0.0036	0.0036	0.0035	0.0042	0.0041	0.0041	0.0042	0.0042	0.0041	0.0040	0.0040	0.0040
Uranium U	mg/L	0.000038	0.000037	0.000036	0.000046	0.000047	0.000047	0.000048	0.000048	0.000047	0.000046	0.000045	0.000045
Vanadium V	mg/L	0.0020	0.0021	0.0022	0.0024	0.0024	0.0025	0.0026	0.0027	0.0027	0.0027	0.0028	0.0028
Zinc Zn	mg/L	0.0147	0.0155	0.0162	0.0172	0.0167	0.0173	0.0183	0.0188	0.0191	0.0197	0.0202	0.0206
Zirconium Zr	mg/L	0.0028	0.0028	0.0027	0.0033	0.0032	0.0032	0.0033	0.0033	0.0032	0.0031	0.0031	0.0030

Table H-2-A-2
Scenario 2

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter													
TDS	mg/L	507	516	525	542	520	522	534	535	539	546	554	561
TSS	mg/L	2.6	2.6	2.5	2.8	2.7	2.7	2.7	2.6	2.6	2.6	2.6	2.6
Free CN	mg/L	0.00126	0.00125	0.00124									
Total CN	mg/L	0.012	0.012	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L	0.0017	0.0017	0.0017									
CNO	mg/L	1.38	1.38	1.37									
SCN	mg/L	0.089	0.088	0.088	0.087	0.081	0.080	0.080	0.078	0.077	0.077	0.077	0.076
Sulphate	mg/L	82.4	82.2	82.1	82.9	78.0	77.1	77.6	76.6	76.0	75.9	75.8	75.7
Chloride	mg/L	318	328	338	354	345	351	363	368	373	381	390	397
Total Ammonia	mg/L	0.273	0.277	0.281	0.496	0.023	0.012	0.014	0.008	0.013	0.018	0.023	0.028
Nitrate	mg/L	4.95	4.87	4.79	5.18	4.98	5.07	5.16	5.11	5.01	4.93	4.86	4.80
Nitrite	mg/L	0.261	0.274	0.288	0.135	0.126	0.017	0.016	0.015	0.028	0.041	0.054	0.066
Alkalinity	mg/L	51	51	50	52	49	49	49	48	48	48	47	47
OrthoPhosphate-P	mg/L	0.1205	0.1247	0.1290	0.1331	0.1286	0.1308	0.1351	0.1371	0.1398	0.1434	0.1471	0.1504
Phosphate-P	mg/L	0.1236	0.1278	0.1321	0.1367	0.1320	0.1343	0.1385	0.1405	0.1431	0.1467	0.1504	0.1537
Org. Carbon	mg/L	3.2	3.2	3.2	3.6	3.6	3.6	3.7	3.6	3.6	3.5	3.5	3.5
Hardness CaCO3	mg/L	99	99	98	100	95	93	94	92	91	91	90	90
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0110	0.0113	0.0115	0.0125	0.0123	0.0126	0.0130	0.0131	0.0132	0.0134	0.0136	0.0138
Arsenic As	mg/L	0.0025	0.0025	0.0025	0.0025	0.0024	0.0024	0.0024	0.0024	0.0023	0.0023	0.0023	0.0023
Barium Ba	mg/L	0.0096	0.0095	0.0095	0.0096	0.0091	0.0089	0.0090	0.0089	0.0088	0.0087	0.0087	0.0087
Beryllium Be	mg/L	0.00049	0.00049	0.00049	0.00054	0.00053	0.00053	0.00054	0.00054	0.00054	0.00055	0.00055	0.00055
Bismuth Bi	mg/L	0.01046	0.01068	0.01091	0.01189	0.01178	0.01201	0.01248	0.01259	0.01269	0.01287	0.01305	0.01323
Boron B	mg/L	0.025	0.025	0.026	0.027	0.026	0.026	0.027	0.026	0.026	0.026	0.026	0.026
Cadmium Cd	mg/L	0.0000500	0.0000498	0.0000496	0.0000506	0.0000479	0.0000474	0.0000477	0.0000470	0.0000465	0.0000463	0.0000461	0.0000459
Calcium Ca	mg/L	222	221	220	219	204	201	201	197	195	194	193	193
Chromium Cr	mg/L	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005
Cobalt Co	mg/L	0.0093	0.0092	0.0092	0.0092	0.0086	0.0085	0.0085	0.0084	0.0083	0.0083	0.0082	0.0082
Copper Cu	mg/L	0.0084	0.0084	0.0084	0.0084	0.0079	0.0078	0.0078	0.0076	0.0076	0.0075	0.0075	0.0075
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00036	0.00036	0.00036	0.00038	0.00037	0.00037	0.00037	0.00037	0.00037	0.00037	0.00037	0.00037
Lithium Li	mg/L	0.0045	0.0045	0.0045	0.0048	0.0046	0.0046	0.0046	0.0046	0.0045	0.0045	0.0045	0.0045
Magnesium Mg	mg/L	8.5	8.5	8.5	8.8	8.4	8.4	8.5	8.4	8.3	8.3	8.3	8.3
Manganese Mn	mg/L	0.026	0.025	0.025	0.025	0.024	0.023	0.024	0.023	0.023	0.023	0.023	0.023
Mercury Hg	mg/L	0.0000052	0.0000052	0.0000051	0.0000053	0.0000050	0.0000049	0.0000050	0.0000049	0.0000049	0.0000048	0.0000048	0.0000048
Molybdenum Mo	mg/L	0.00804	0.00800	0.00796	0.00793	0.00740	0.00727	0.00727	0.00714	0.00706	0.00703	0.00700	0.00697
Nickel Ni	mg/L	0.0075	0.0074	0.0074	0.0075	0.0071	0.0070	0.0071	0.0070	0.0069	0.0069	0.0069	0.0069
Phosphorus P	mg/L	0.200	0.204	0.208	0.215	0.206	0.208	0.213	0.214	0.216	0.220	0.223	0.227
Potassium K	mg/L	37.0	36.8	36.6	36.5	34.1	33.5	33.5	32.9	32.5	32.4	32.2	32.1
Selenium Se	mg/L	0.00044	0.00044	0.00044	0.00047	0.00045	0.00045	0.00045	0.00045	0.00044	0.00044	0.00044	0.00044
Silicon SiO2	mg/L	3.58	3.57	3.55	3.62	3.41	3.36	3.38	3.33	3.29	3.27	3.26	3.25
Silver Ag	mg/L	0.0000993	0.0000994	0.0000994	0.0001101	0.0001081	0.0001075	0.0001089	0.0001078	0.0001070	0.0001069	0.0001069	0.0001070
Sodium Na	mg/L	43	43	42	43	41	41	41	40	40	39	39	39
Strontium Sr	mg/L	0.080	0.080	0.080	0.081	0.077	0.076	0.076	0.075	0.074	0.074	0.073	0.073
Tellurium Te	mg/L	0.027	0.026	0.026	0.030	0.030	0.030	0.030	0.030	0.029	0.029	0.029	0.029
Thallium Tl	mg/L	0.000039	0.000039	0.000039	0.000041	0.000040	0.000040	0.000040	0.000040	0.000039	0.000039	0.000039	0.000039
Thorium Th	mg/L	0.000018	0.000018	0.000018	0.000020	0.000020	0.000020	0.000021	0.000021	0.000020	0.000020	0.000020	0.000020
Tin Sn	mg/L	0.00166	0.00169	0.00173	0.00188	0.00187	0.00191	0.00199	0.00200	0.00202	0.00204	0.00207	0.00209
Titanium Ti	mg/L	0.0039	0.0039	0.0039	0.0044	0.0043	0.0043	0.0044	0.0044	0.0044	0.0043	0.0043	0.0043
Uranium U	mg/L	0.000044	0.000044	0.000044	0.000050	0.000050	0.000049	0.000050	0.000050	0.000049	0.000049	0.000049	0.000049
Vanadium V	mg/L	0.0028	0.0029	0.0029	0.0031	0.0030	0.0030	0.0031	0.0031	0.0031	0.0031	0.0031	0.0031
Zinc Zn	mg/L	0.0204	0.0204	0.0203	0.0205	0.0192	0.0190	0.0192	0.0189	0.0187	0.0187	0.0186	0.0186
Zirconium Zr	mg/L	0.0030	0.0030	0.0030	0.0034	0.0033	0.0033	0.0034	0.0034	0.0033	0.0033	0.0033	0.0033

Table H-2-A-2
Scenario 2

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter													
TDS	mg/L	559	558	556	562	533	527	529	522	517	515	514	513
TSS	mg/L	2.6	2.6	2.6	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.6	2.6
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.076	0.076	0.076	0.075	0.071	0.070	0.070	0.069	0.069	0.068	0.068	0.068
Sulphate	mg/L	75.4	75.3	75.0	74.9	70.7	69.8	69.9	69.0	68.4	68.2	68.0	67.9
Chloride	mg/L	396	395	394	394	372	368	369	364	361	360	359	358
Total Ammonia	mg/L	0.027	0.027	0.027	0.012	0.007	0.003	0.004	0.001	0.001	0.001	0.001	0.001
Nitrate	mg/L	4.73	4.66	4.60	4.74	4.52	4.49	4.52	4.47	4.38	4.32	4.26	4.20
Nitrite	mg/L	0.065	0.065	0.065	0.005	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Alkalinity	mg/L	47	47	47	48	46	46	46	46	45	45	45	45
OrthoPhosphate-P	mg/L	0.1499	0.1495	0.1491	0.1487	0.1402	0.1383	0.1386	0.1366	0.1354	0.1350	0.1347	0.1344
Phosphate-P	mg/L	0.1531	0.1527	0.1523	0.1524	0.1437	0.1419	0.1421	0.1401	0.1389	0.1385	0.1381	0.1379
Org. Carbon	mg/L	3.5	3.5	3.5	3.9	3.8	3.8	3.9	3.9	3.8	3.8	3.8	3.8
Hardness CaCO3	mg/L	89	89	89	91	87	86	87	85	85	84	84	84
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0137	0.0137	0.0136	0.0136	0.0128	0.0127	0.0127	0.0125	0.0124	0.0124	0.0123	0.0123
Arsenic As	mg/L	0.0023	0.0023	0.0023	0.0023	0.0022	0.0022	0.0022	0.0022	0.0021	0.0021	0.0021	0.0021
Barium Ba	mg/L	0.0087	0.0086	0.0086	0.0087	0.0082	0.0082	0.0082	0.0081	0.0080	0.0080	0.0080	0.0080
Beryllium Be	mg/L	0.00055	0.00055	0.00055	0.00056	0.00054	0.00053	0.00053	0.00053	0.00052	0.00052	0.00052	0.00052
Bismuth Bi	mg/L	0.01318	0.01315	0.01311	0.01307	0.01232	0.01216	0.01218	0.01201	0.01190	0.01186	0.01184	0.01181
Boron B	mg/L	0.026	0.026	0.026	0.027	0.026	0.026	0.026	0.026	0.025	0.025	0.025	0.025
Cadmium Cd	mg/L	0.0000458	0.0000456	0.0000455	0.0000465	0.0000444	0.0000441	0.0000445	0.0000440	0.0000436	0.0000435	0.0000434	0.0000433
Calcium Ca	mg/L	192	192	191	191	180	178	178	175	174	173	173	173
Chromium Cr	mg/L	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Cobalt Co	mg/L	0.0082	0.0082	0.0081	0.0081	0.0077	0.0076	0.0076	0.0075	0.0074	0.0074	0.0074	0.0074
Copper Cu	mg/L	0.0075	0.0074	0.0074	0.0074	0.0071	0.0070	0.0070	0.0069	0.0068	0.0068	0.0068	0.0068
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00037	0.00037	0.00037	0.00037	0.00035	0.00035	0.00035	0.00035	0.00034	0.00034	0.00034	0.00034
Lithium Li	mg/L	0.0045	0.0045	0.0045	0.0047	0.0045	0.0045	0.0045	0.0045	0.0044	0.0044	0.0044	0.0044
Magnesium Mg	mg/L	8.2	8.2	8.2	8.4	8.1	8.0	8.1	8.0	7.9	7.9	7.9	7.9
Manganese Mn	mg/L	0.023	0.023	0.023	0.022	0.021	0.021	0.021	0.021	0.021	0.020	0.020	0.020
Mercury Hg	mg/L	0.0000048	0.0000048	0.0000048	0.0000049	0.0000046	0.0000046	0.0000046	0.0000046	0.0000046	0.0000045	0.0000045	0.0000045
Molybdenum Mo	mg/L	0.00695	0.00693	0.00691	0.00689	0.00650	0.00642	0.00643	0.00634	0.00628	0.00626	0.00625	0.00623
Nickel Ni	mg/L	0.0069	0.0069	0.0069	0.0069	0.0065	0.0064	0.0064	0.0063	0.0063	0.0063	0.0062	0.0062
Phosphorus P	mg/L	0.226	0.225	0.225	0.225	0.213	0.210	0.211	0.208	0.206	0.205	0.205	0.204
Potassium K	mg/L	32.0	31.9	31.8	31.8	30.0	29.6	29.7	29.3	29.0	29.0	28.9	28.8
Selenium Se	mg/L	0.00043	0.00043	0.00043	0.00046	0.00045	0.00045	0.00045	0.00045	0.00044	0.00044	0.00044	0.00044
Silicon SiO2	mg/L	3.24	3.23	3.22	3.28	3.12	3.09	3.11	3.07	3.04	3.03	3.02	3.02
Silver Ag	mg/L	0.0001066	0.0001063	0.0001060	0.0001135	0.0001106	0.0001095	0.0001101	0.0001087	0.0001078	0.0001074	0.0001072	0.0001070
Sodium Na	mg/L	39	39	39	40	38	38	38	37	37	37	37	37
Strontium Sr	mg/L	0.073	0.073	0.073	0.074	0.070	0.070	0.070	0.069	0.069	0.068	0.068	0.068
Tellurium Te	mg/L	0.029	0.029	0.029	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.031	0.031
Thallium Tl	mg/L	0.000038	0.000038	0.000038	0.000040	0.000039	0.000039	0.000040	0.000039	0.000039	0.000039	0.000039	0.000039
Thorium Th	mg/L	0.000020	0.000020	0.000020	0.000022	0.000022	0.000022	0.000023	0.000023	0.000022	0.000022	0.000022	0.000022
Tin Sn	mg/L	0.00209	0.00208	0.00208	0.00208	0.00197	0.00195	0.00195	0.00193	0.00191	0.00191	0.00190	0.00190
Titanium Ti	mg/L	0.0043	0.0043	0.0043	0.0047	0.0046	0.0046	0.0046	0.0046	0.0046	0.0045	0.0045	0.0045
Uranium U	mg/L	0.000049	0.000048	0.000048	0.000053	0.000053	0.000053	0.000054	0.000053	0.000053	0.000052	0.000052	0.000052
Vanadium V	mg/L	0.0031	0.0031	0.0031	0.0031	0.0030	0.0029	0.0029	0.0029	0.0029	0.0029	0.0029	0.0029
Zinc Zn	mg/L	0.0185	0.0185	0.0184	0.0184	0.0174	0.0172	0.0173	0.0171	0.0170	0.0169	0.0169	0.0168
Zirconium Zr	mg/L	0.0033	0.0033	0.0033	0.0036	0.0036	0.0036	0.0037	0.0036	0.0036	0.0036	0.0036	0.0036

Table H-2-A-2
Scenario 2

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter													
TDS	mg/L	512	511	510	515	491	487	489	483	479	477	476	476
TSS	mg/L	2.6	2.6	2.6	2.8	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.068	0.068	0.068	0.067	0.064	0.063	0.063	0.063	0.062	0.062	0.062	0.062
Sulphate	mg/L	67.8	67.6	67.4	67.3	64.0	63.3	63.4	62.6	62.1	61.9	61.8	61.7
Chloride	mg/L	357	357	356	356	339	335	336	332	329	329	328	327
Total Ammonia	mg/L	0.001	0.001	0.001	0.011	0.006	0.003	0.004	0.001	0.001	0.001	0.001	0.001
Nitrate	mg/L	4.15	4.09	4.03	4.10	3.94	3.92	3.95	3.91	3.84	3.78	3.73	3.68
Nitrite	mg/L	0.001	0.001	0.001	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Alkalinity	mg/L	45	45	45	46	44	44	44	44	44	43	43	43
OrthoPhosphate-P	mg/L	0.1342	0.1339	0.1335	0.1332	0.1264	0.1251	0.1253	0.1237	0.1227	0.1224	0.1221	0.1219
Phosphate-P	mg/L	0.1377	0.1373	0.1370	0.1370	0.1301	0.1287	0.1290	0.1274	0.1263	0.1260	0.1257	0.1255
Org. Carbon	mg/L	3.8	3.8	3.8	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.0	4.0
Hardness CaCO3	mg/L	84	84	84	85	82	81	82	81	80	80	80	80
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0123	0.0123	0.0122	0.0122	0.0116	0.0115	0.0115	0.0113	0.0113	0.0112	0.0112	0.0112
Arsenic As	mg/L	0.0021	0.0021	0.0021	0.0021	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
Barium Ba	mg/L	0.0079	0.0079	0.0079	0.0080	0.0076	0.0076	0.0076	0.0075	0.0074	0.0074	0.0074	0.0074
Beryllium Be	mg/L	0.00052	0.00052	0.00052	0.00053	0.00051	0.00050	0.00051	0.00050	0.00050	0.00049	0.00049	0.00049
Bismuth Bi	mg/L	0.01179	0.01177	0.01174	0.01170	0.01110	0.01098	0.01100	0.01086	0.01078	0.01075	0.01072	0.01070
Boron B	mg/L	0.025	0.025	0.025	0.026	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.024
Cadmium Cd	mg/L	0.0000432	0.0000431	0.0000430	0.0000439	0.0000422	0.0000420	0.0000423	0.0000419	0.0000415	0.0000414	0.0000413	0.0000413
Calcium Ca	mg/L	172	172	172	171	163	161	161	159	158	158	157	157
Chromium Cr	mg/L	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004
Cobalt Co	mg/L	0.0073	0.0073	0.0073	0.0073	0.0069	0.0068	0.0069	0.0068	0.0067	0.0067	0.0067	0.0067
Copper Cu	mg/L	0.0068	0.0068	0.0067	0.0068	0.0065	0.0064	0.0064	0.0063	0.0063	0.0063	0.0062	0.0062
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00034	0.00034	0.00034	0.00035	0.00033	0.00033	0.00033	0.00033	0.00032	0.00032	0.00032	0.00032
Lithium Li	mg/L	0.0044	0.0044	0.0044	0.0046	0.0044	0.0044	0.0044	0.0044	0.0043	0.0043	0.0043	0.0043
Magnesium Mg	mg/L	7.9	7.8	7.8	8.0	7.7	7.7	7.8	7.7	7.6	7.6	7.6	7.6
Manganese Mn	mg/L	0.020	0.020	0.020	0.020	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019
Mercury Hg	mg/L	0.0000045	0.0000045	0.0000045	0.0000046	0.0000044	0.0000044	0.0000044	0.0000044	0.0000043	0.0000043	0.0000043	0.0000043
Molybdenum Mo	mg/L	0.00622	0.00621	0.00619	0.00618	0.00586	0.00580	0.00581	0.00574	0.00569	0.00567	0.00566	0.00565
Nickel Ni	mg/L	0.0062	0.0062	0.0062	0.0062	0.0059	0.0058	0.0059	0.0058	0.0057	0.0057	0.0057	0.0057
Phosphorus P	mg/L	0.204	0.204	0.203	0.203	0.193	0.191	0.192	0.190	0.188	0.188	0.187	0.187
Potassium K	mg/L	28.8	28.7	28.6	28.6	27.2	26.9	27.0	26.6	26.4	26.4	26.3	26.3
Selenium Se	mg/L	0.00044	0.00044	0.00044	0.00046	0.00045	0.00045	0.00045	0.00045	0.00045	0.00044	0.00044	0.00044
Silicon SiO2	mg/L	3.01	3.01	3.00	3.05	2.92	2.90	2.91	2.88	2.86	2.85	2.84	2.84
Silver Ag	mg/L	0.0001068	0.0001065	0.0001063	0.0001129	0.0001104	0.0001094	0.0001100	0.0001088	0.0001079	0.0001076	0.0001073	0.0001072
Sodium Na	mg/L	37	37	36	37	36	36	36	35	35	35	35	35
Strontium Sr	mg/L	0.068	0.068	0.068	0.069	0.066	0.065	0.066	0.065	0.064	0.064	0.064	0.064
Tellurium Te	mg/L	0.031	0.031	0.031	0.034	0.033	0.034	0.034	0.034	0.034	0.033	0.033	0.033
Thallium Tl	mg/L	0.000038	0.000038	0.000038	0.000040	0.000039	0.000039	0.000039	0.000039	0.000039	0.000039	0.000039	0.000039
Thorium Th	mg/L	0.000022	0.000022	0.000022	0.000024	0.000024	0.000024	0.000024	0.000024	0.000024	0.000024	0.000024	0.000024
Tin Sn	mg/L	0.00189	0.00189	0.00189	0.00189	0.00180	0.00178	0.00179	0.00177	0.00176	0.00175	0.00175	0.00174
Titanium Ti	mg/L	0.0045	0.0045	0.0045	0.0048	0.0047	0.0047	0.0048	0.0048	0.0047	0.0047	0.0047	0.0047
Uranium U	mg/L	0.000052	0.000052	0.000052	0.000056	0.000056	0.000056	0.000056	0.000056	0.000055	0.000055	0.000055	0.000055
Vanadium V	mg/L	0.0029	0.0028	0.0028	0.0029	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0026	0.0026
Zinc Zn	mg/L	0.0168	0.0168	0.0167	0.0167	0.0159	0.0158	0.0159	0.0157	0.0156	0.0155	0.0155	0.0155
Zirconium Zr	mg/L	0.0036	0.0035	0.0035	0.0039	0.0038	0.0038	0.0039	0.0038	0.0038	0.0038	0.0038	0.0038

Table H-2-A-2
Scenario 2

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter													
TDS	mg/L	475	474	473	477	458	454	456	451	448	446	445	445
TSS	mg/L	2.7	2.7	2.7	2.8	2.7	2.7	2.8	2.7	2.7	2.7	2.7	2.7
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.062	0.061	0.061	0.061	0.058	0.058	0.058	0.057	0.057	0.057	0.056	0.056
Sulphate	mg/L	61.6	61.5	61.3	61.3	58.5	58.0	58.1	57.4	57.0	56.9	56.7	56.6
Chloride	mg/L	327	326	325	326	312	309	310	306	304	303	302	302
Total Ammonia	mg/L	0.001	0.001	0.001	0.010	0.006	0.002	0.003	0.001	0.001	0.001	0.001	0.001
Nitrate	mg/L	3.62	3.57	3.52	3.58	3.46	3.45	3.48	3.45	3.38	3.33	3.28	3.23
Nitrite	mg/L	0.001	0.001	0.001	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Alkalinity	mg/L	43	43	43	44	43	43	43	43	42	42	42	42
OrthoPhosphate-P	mg/L	0.1217	0.1214	0.1211	0.1208	0.1153	0.1142	0.1144	0.1131	0.1123	0.1120	0.1117	0.1116
Phosphate-P	mg/L	0.1253	0.1250	0.1247	0.1248	0.1191	0.1180	0.1183	0.1169	0.1161	0.1157	0.1155	0.1153
Org. Carbon	mg/L	4.0	4.0	4.0	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.2	4.2
Hardness CaCO3	mg/L	80	79	79	81	78	77	78	77	77	76	76	76
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0112	0.0111	0.0111	0.0111	0.0106	0.0105	0.0105	0.0104	0.0103	0.0103	0.0103	0.0102
Arsenic As	mg/L	0.0020	0.0020	0.0020	0.0020	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019
Barium Ba	mg/L	0.0074	0.0074	0.0073	0.0074	0.0071	0.0071	0.0071	0.0070	0.0070	0.0070	0.0069	0.0069
Beryllium Be	mg/L	0.00049	0.00049	0.00049	0.00050	0.00048	0.00048	0.00048	0.00048	0.00047	0.00047	0.00047	0.00047
Bismuth Bi	mg/L	0.01069	0.01066	0.01064	0.01061	0.01012	0.01003	0.01004	0.00993	0.00986	0.00983	0.00981	0.00979
Boron B	mg/L	0.024	0.024	0.024	0.025	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024
Cadmium Cd	mg/L	0.0000412	0.0000411	0.0000410	0.0000418	0.0000404	0.0000402	0.0000405	0.0000402	0.0000399	0.0000398	0.0000397	0.0000396
Calcium Ca	mg/L	157	156	156	156	149	147	148	146	145	145	144	144
Chromium Cr	mg/L	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Cobalt Co	mg/L	0.0067	0.0066	0.0066	0.0066	0.0063	0.0063	0.0063	0.0062	0.0062	0.0061	0.0061	0.0061
Copper Cu	mg/L	0.0062	0.0062	0.0062	0.0062	0.0060	0.0059	0.0059	0.0059	0.0058	0.0058	0.0058	0.0058
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00032	0.00032	0.00032	0.00032	0.00031	0.00031	0.00031	0.00031	0.00031	0.00031	0.00031	0.00031
Lithium Li	mg/L	0.0043	0.0043	0.0043	0.0045	0.0043	0.0043	0.0044	0.0043	0.0043	0.0043	0.0043	0.0043
Magnesium Mg	mg/L	7.5	7.5	7.5	7.7	7.5	7.4	7.5	7.4	7.4	7.3	7.3	7.3
Manganese Mn	mg/L	0.019	0.019	0.018	0.018	0.018	0.017	0.018	0.017	0.017	0.017	0.017	0.017
Mercury Hg	mg/L	0.0000043	0.0000043	0.0000043	0.0000044	0.0000042	0.0000042	0.0000042	0.0000042	0.0000041	0.0000041	0.0000041	0.0000041
Molybdenum Mo	mg/L	0.00564	0.00563	0.00562	0.00560	0.00535	0.00530	0.00531	0.00525	0.00521	0.00519	0.00518	0.00518
Nickel Ni	mg/L	0.0057	0.0057	0.0057	0.0057	0.0054	0.0054	0.0054	0.0053	0.0053	0.0053	0.0053	0.0053
Phosphorus P	mg/L	0.186	0.186	0.186	0.186	0.178	0.176	0.177	0.175	0.174	0.173	0.173	0.172
Potassium K	mg/L	26.2	26.2	26.1	26.1	24.9	24.7	24.8	24.5	24.3	24.2	24.2	24.1
Selenium Se	mg/L	0.00044	0.00044	0.00044	0.00046	0.00045	0.00045	0.00046	0.00045	0.00045	0.00045	0.00045	0.00045
Silicon SiO2	mg/L	2.83	2.83	2.82	2.87	2.76	2.74	2.76	2.73	2.71	2.70	2.69	2.69
Silver Ag	mg/L	0.0001070	0.0001068	0.0001065	0.0001124	0.0001102	0.0001094	0.0001100	0.0001089	0.0001081	0.0001078	0.0001075	0.0001074
Sodium Na	mg/L	35	35	35	35	34	34	34	34	34	34	33	33
Strontium Sr	mg/L	0.064	0.064	0.064	0.065	0.062	0.062	0.062	0.062	0.061	0.061	0.061	0.061
Tellurium Te	mg/L	0.033	0.033	0.033	0.036	0.035	0.035	0.036	0.035	0.035	0.035	0.035	0.035
Thallium Tl	mg/L	0.000038	0.000038	0.000038	0.000040	0.000039	0.000039	0.000039	0.000039	0.000039	0.000039	0.000039	0.000039
Thorium Th	mg/L	0.000024	0.000024	0.000024	0.000025	0.000025	0.000025	0.000026	0.000026	0.000026	0.000025	0.000025	0.000025
Tin Sn	mg/L	0.00174	0.00174	0.00173	0.00174	0.00167	0.00165	0.00166	0.00164	0.00163	0.00162	0.00162	0.00162
Titanium Ti	mg/L	0.0047	0.0047	0.0047	0.0050	0.0049	0.0049	0.0049	0.0049	0.0049	0.0048	0.0048	0.0048
Uranium U	mg/L	0.000055	0.000055	0.000055	0.000059	0.000058	0.000058	0.000059	0.000058	0.000058	0.000058	0.000058	0.000057
Vanadium V	mg/L	0.0026	0.0026	0.0026	0.0026	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
Zinc Zn	mg/L	0.0154	0.0154	0.0154	0.0154	0.0147	0.0146	0.0147	0.0145	0.0144	0.0144	0.0144	0.0143
Zirconium Zr	mg/L	0.0038	0.0038	0.0038	0.0040	0.0040	0.0040	0.0041	0.0040	0.0040	0.0040	0.0040	0.0040

Table H-2-A-2
Scenario 2

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter													
TDS	mg/L	444	443	442	446	430	427	429	424	421	420	420	419
TSS	mg/L	2.7	2.7	2.7	2.8	2.8	2.8	2.8	2.8	2.8	2.7	2.7	2.7
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.056	0.056	0.056	0.056	0.054	0.053	0.053	0.053	0.052	0.052	0.052	0.052
Sulphate	mg/L	56.6	56.4	56.3	56.2	53.9	53.5	53.6	53.1	52.7	52.6	52.5	52.4
Chloride	mg/L	302	301	300	301	289	287	288	285	283	282	281	281
Total Ammonia	mg/L	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nitrate	mg/L	3.19	3.14	3.09	3.08	2.95	2.93	2.93	2.90	2.84	2.79	2.75	2.70
Nitrite	mg/L	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alkalinity	mg/L	42	42	42	43	42	41	42	41	41	41	41	41
OrthoPhosphate-P	mg/L	0.1114	0.1112	0.1109	0.1107	0.1061	0.1052	0.1055	0.1043	0.1036	0.1034	0.1031	0.1030
Phosphate-P	mg/L	0.1151	0.1149	0.1146	0.1147	0.1100	0.1092	0.1094	0.1082	0.1075	0.1072	0.1070	0.1068
Org. Carbon	mg/L	4.2	4.2	4.2	4.5	4.4	4.4	4.5	4.5	4.4	4.4	4.4	4.4
Hardness CaCO3	mg/L	76	76	76	77	75	74	75	74	73	73	73	73
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0102	0.0102	0.0102	0.0102	0.0097	0.0097	0.0097	0.0096	0.0095	0.0095	0.0095	0.0095
Arsenic As	mg/L	0.0019	0.0019	0.0019	0.0019	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0017	0.0017
Barium Ba	mg/L	0.0069	0.0069	0.0069	0.0069	0.0067	0.0067	0.0067	0.0066	0.0066	0.0066	0.0066	0.0065
Beryllium Be	mg/L	0.00047	0.00047	0.00047	0.00048	0.00046	0.00046	0.00046	0.00045	0.00045	0.00045	0.00045	0.00045
Bismuth Bi	mg/L	0.00978	0.00976	0.00974	0.00971	0.00930	0.00923	0.00924	0.00915	0.00908	0.00906	0.00904	0.00903
Boron B	mg/L	0.024	0.024	0.024	0.024	0.024	0.023	0.024	0.023	0.023	0.023	0.023	0.023
Cadmium Cd	mg/L	0.0000396	0.0000395	0.0000394	0.0000394	0.0000378	0.0000375	0.0000376	0.0000372	0.0000369	0.0000368	0.0000367	0.0000367
Calcium Ca	mg/L	144	144	143	143	137	136	136	135	134	134	133	133
Chromium Cr	mg/L	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Cobalt Co	mg/L	0.0061	0.0061	0.0061	0.0061	0.0058	0.0058	0.0058	0.0057	0.0057	0.0057	0.0056	0.0056
Copper Cu	mg/L	0.0058	0.0058	0.0058	0.0058	0.0056	0.0055	0.0055	0.0055	0.0054	0.0054	0.0054	0.0054
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00030	0.00030	0.00030	0.00031	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029	0.00029
Lithium Li	mg/L	0.0042	0.0042	0.0042	0.0044	0.0043	0.0042	0.0043	0.0042	0.0042	0.0042	0.0042	0.0042
Magnesium Mg	mg/L	7.3	7.3	7.3	7.4	7.2	7.2	7.2	7.2	7.1	7.1	7.1	7.1
Manganese Mn	mg/L	0.017	0.017	0.017	0.017	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016
Mercury Hg	mg/L	0.0000041	0.0000041	0.0000041	0.0000041	0.0000040	0.0000039	0.0000039	0.0000039	0.0000039	0.0000039	0.0000039	0.0000038
Molybdenum Mo	mg/L	0.00517	0.00516	0.00514	0.00513	0.00492	0.00488	0.00489	0.00484	0.00481	0.00479	0.00478	0.00478
Nickel Ni	mg/L	0.0053	0.0052	0.0052	0.0052	0.0050	0.0050	0.0050	0.0050	0.0049	0.0049	0.0049	0.0049
Phosphorus P	mg/L	0.172	0.172	0.171	0.171	0.164	0.163	0.163	0.162	0.160	0.160	0.160	0.159
Potassium K	mg/L	24.1	24.1	24.0	24.0	23.0	22.9	22.9	22.7	22.5	22.5	22.4	22.4
Selenium Se	mg/L	0.00044	0.00044	0.00044	0.00046	0.00045	0.00045	0.00045	0.00045	0.00044	0.00044	0.00044	0.00044
Silicon SiO2	mg/L	2.69	2.68	2.67	2.71	2.61	2.60	2.61	2.58	2.57	2.56	2.55	2.55
Silver Ag	mg/L	0.0001072	0.0001070	0.0001067	0.0001111	0.0001086	0.0001077	0.0001079	0.0001068	0.0001061	0.0001058	0.0001056	0.0001054
Sodium Na	mg/L	33	33	33	34	33	33	33	33	32	32	32	32
Strontium Sr	mg/L	0.061	0.060	0.060	0.061	0.059	0.059	0.059	0.059	0.058	0.058	0.058	0.058
Tellurium Te	mg/L	0.035	0.035	0.035	0.037	0.036	0.036	0.037	0.037	0.036	0.036	0.036	0.036
Thallium Tl	mg/L	0.000038	0.000038	0.000038	0.000040	0.000039	0.000038	0.000039	0.000038	0.000038	0.000038	0.000038	0.000038
Thorium Th	mg/L	0.000025	0.000025	0.000025	0.000025	0.000024	0.000024	0.000024	0.000024	0.000024	0.000023	0.000023	0.000023
Tin Sn	mg/L	0.00162	0.00161	0.00161	0.00161	0.00155	0.00154	0.00154	0.00153	0.00152	0.00151	0.00151	0.00151
Titanium Ti	mg/L	0.0048	0.0048	0.0048	0.0051	0.0050	0.0050	0.0050	0.0050	0.0050	0.0049	0.0049	0.0049
Uranium U	mg/L	0.000057	0.000057	0.000057	0.000059	0.000058	0.000057	0.000058	0.000057	0.000057	0.000056	0.000056	0.000056
Vanadium V	mg/L	0.0025	0.0025	0.0025	0.0025	0.0024	0.0024	0.0024	0.0023	0.0023	0.0023	0.0023	0.0023
Zinc Zn	mg/L	0.0143	0.0143	0.0142	0.0142	0.0137	0.0136	0.0137	0.0135	0.0134	0.0134	0.0134	0.0134
Zirconium Zr	mg/L	0.0040	0.0040	0.0039	0.0042	0.0041	0.0041	0.0042	0.0041	0.0041	0.0041	0.0041	0.0041

Table H-2-A-2
Scenario 2

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter													
TDS	mg/L	418	418	417	472	495	555	607	652	647	647	647	647
TSS	mg/L	2.7	2.7	2.7	2.9	2.8	2.9	3.0	2.9	2.9	2.9	2.9	2.9
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.052	0.052	0.052	0.052	0.048	0.049	0.049	0.049	0.048	0.048	0.048	0.048
Sulphate	mg/L	52.3	52.2	52.1	52.0	48.9	49.7	49.8	49.3	49.0	49.0	49.0	49.0
Chloride	mg/L	281	280	280	314	326	363	395	422	420	420	420	420
Total Ammonia	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nitrate	mg/L	2.66	2.61	2.57	2.56	2.40	2.44	2.45	2.42	2.37	2.33	2.29	2.25
Nitrite	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alkalinity	mg/L	41	41	41	42	40	40	41	40	40	40	40	40
OrthoPhosphate-P	mg/L	0.1028	0.1026	0.1024	0.1022	0.0960	0.0976	0.0978	0.0968	0.0961	0.0961	0.0961	0.0961
Phosphate-P	mg/L	0.1067	0.1065	0.1062	0.1069	0.1006	0.1024	0.1027	0.1017	0.1010	0.1010	0.1010	0.1010
Org. Carbon	mg/L	4.4	4.4	4.4	4.6	4.5	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Hardness CaCO3	mg/L	73	73	73	74	70	71	72	71	71	71	71	71
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Antimony Sb	mg/L	0.0095	0.0094	0.0094	0.0094	0.0088	0.0090	0.0090	0.0089	0.0088	0.0088	0.0088	0.0088
Arsenic As	mg/L	0.0017	0.0017	0.0017	0.0018	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017
Barium Ba	mg/L	0.0065	0.0065	0.0065	0.0066	0.0062	0.0063	0.0063	0.0063	0.0062	0.0062	0.0062	0.0062
Beryllium Be	mg/L	0.00045	0.00045	0.00044	0.00045	0.00043	0.00044	0.00044	0.00043	0.00043	0.00043	0.00043	0.00043
Bismuth Bi	mg/L	0.00901	0.00900	0.00898	0.00896	0.00840	0.00854	0.00856	0.00847	0.00842	0.00842	0.00842	0.00842
Boron B	mg/L	0.023	0.023	0.023	0.024	0.023	0.024	0.024	0.024	0.024	0.024	0.024	0.024
Cadmium Cd	mg/L	0.0000366	0.0000366	0.0000365	0.0000367	0.0000346	0.0000353	0.0000354	0.0000351	0.0000348	0.0000348	0.0000348	0.0000348
Calcium Ca	mg/L	133	133	132	135	130	135	139	140	139	139	139	139
Chromium Cr	mg/L	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Cobalt Co	mg/L	0.0056	0.0056	0.0056	0.0056	0.0053	0.0053	0.0054	0.0053	0.0053	0.0053	0.0053	0.0053
Copper Cu	mg/L	0.0054	0.0054	0.0054	0.0054	0.0051	0.0052	0.0052	0.0052	0.0051	0.0051	0.0051	0.0051
Iron Fe	mg/L	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Lead Pb	mg/L	0.00028	0.00028	0.00028	0.00029	0.00027	0.00028	0.00028	0.00027	0.00027	0.00027	0.00027	0.00027
Lithium Li	mg/L	0.0042	0.0042	0.0042	0.0044	0.0042	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043
Magnesium Mg	mg/L	7.1	7.1	7.0	7.3	7.0	7.1	7.2	7.1	7.1	7.1	7.1	7.1
Manganese Mn	mg/L	0.016	0.016	0.016	0.016	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015
Mercury Hg	mg/L	0.0000038	0.0000038	0.0000038	0.0000044	0.0000044	0.0000045	0.0000047	0.0000046	0.0000046	0.0000046	0.0000046	0.0000046
Molybdenum Mo	mg/L	0.00477	0.00476	0.00475	0.00475	0.00446	0.00454	0.00455	0.00451	0.00448	0.00448	0.00448	0.00448
Nickel Ni	mg/L	0.0049	0.0049	0.0049	0.0049	0.0046	0.0047	0.0047	0.0046	0.0046	0.0046	0.0046	0.0046
Phosphorus P	mg/L	0.159	0.159	0.159	0.159	0.149	0.151	0.152	0.150	0.149	0.149	0.149	0.149
Potassium K	mg/L	22.4	22.3	22.3	22.3	21.0	21.4	21.5	21.3	21.1	21.1	21.1	21.1
Selenium Se	mg/L	0.00044	0.00044	0.00044	0.00048	0.00047	0.00049	0.00050	0.00049	0.00049	0.00049	0.00049	0.00049
Silicon SiO2	mg/L	2.55	2.54	2.54	2.59	2.45	2.50	2.51	2.49	2.48	2.48	2.48	2.48
Silver Ag	mg/L	0.0001053	0.0001051	0.0001048	0.0001091	0.0001044	0.0001062	0.0001065	0.0001054	0.0001047	0.0001047	0.0001047	0.0001047
Sodium Na	mg/L	32	32	32	51	65	84	101	117	116	116	116	116
Strontium Sr	mg/L	0.058	0.058	0.058	0.059	0.056	0.057	0.057	0.057	0.057	0.057	0.057	0.057
Tellurium Te	mg/L	0.036	0.036	0.036	0.038	0.037	0.038	0.038	0.038	0.037	0.037	0.037	0.037
Thallium Tl	mg/L	0.000038	0.000038	0.000038	0.000039	0.000037	0.000038	0.000038	0.000038	0.000038	0.000038	0.000038	0.000038
Thorium Th	mg/L	0.000023	0.000023	0.000023	0.000025	0.000025	0.000025	0.000026	0.000025	0.000025	0.000025	0.000025	0.000025
Tin Sn	mg/L	0.00150	0.00150	0.00150	0.00150	0.00141	0.00144	0.00144	0.00143	0.00142	0.00142	0.00142	0.00142
Titanium Ti	mg/L	0.0049	0.0049	0.0049	0.0055	0.0055	0.0057	0.0058	0.0058	0.0057	0.0057	0.0057	0.0057
Uranium U	mg/L	0.000056	0.000056	0.000056	0.000059	0.000057	0.000058	0.000059	0.000058	0.000058	0.000058	0.000058	0.000058
Vanadium V	mg/L	0.0023	0.0023	0.0023	0.0024	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023
Zinc Zn	mg/L	0.0133	0.0133	0.0133	0.0133	0.0125	0.0128	0.0128	0.0127	0.0127	0.0127	0.0127	0.0127
Zirconium Zr	mg/L	0.0041	0.0041	0.0040	0.0042	0.0041	0.0042	0.0042	0.0042	0.0042	0.0042	0.0042	0.0042

Table H-2-A-2
Scenario 2

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter													
TDS	mg/L	647	647	647	623	629	618	628	617	617	617	617	617
TSS	mg/L	2.9	2.9	2.9	3.0	3.1	3.1	3.2	3.1	3.1	3.1	3.1	3.1
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.048	0.048	0.048	0.046	0.047	0.046	0.046	0.046	0.046	0.046	0.046	0.046
Sulphate	mg/L	49.0	49.0	49.0	46.9	47.3	46.4	47.0	46.3	46.3	46.3	46.3	46.3
Chloride	mg/L	420	420	420	404	409	401	407	401	401	401	401	401
Total Ammonia	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nitrate	mg/L	2.21	2.17	2.14	2.04	2.05	2.02	2.04	2.01	1.97	1.93	1.89	1.85
Nitrite	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alkalinity	mg/L	40	40	40	39	40	40	40	40	40	40	40	40
OrthoPhosphate-P	mg/L	0.0961	0.0961	0.0961	0.0920	0.0926	0.0909	0.0921	0.0906	0.0906	0.0906	0.0906	0.0906
Phosphate-P	mg/L	0.1010	0.1010	0.1010	0.0974	0.0983	0.0966	0.0980	0.0964	0.0964	0.0964	0.0964	0.0964
Org. Carbon	mg/L	4.6	4.6	4.6	4.6	4.8	4.7	4.8	4.8	4.8	4.8	4.8	4.8
Hardness CaCO3	mg/L	71	71	71	69	70	69	70	69	69	69	69	69
Total Metals													
Aluminum Al	mg/L	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Antimony Sb	mg/L	0.0088	0.0088	0.0088	0.0085	0.0085	0.0084	0.0085	0.0083	0.0083	0.0083	0.0083	0.0083
Arsenic As	mg/L	0.0017	0.0017	0.0017	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016
Barium Ba	mg/L	0.0062	0.0062	0.0062	0.0060	0.0061	0.0060	0.0061	0.0060	0.0060	0.0060	0.0060	0.0060
Beryllium Be	mg/L	0.00043	0.00043	0.00043	0.00042	0.00042	0.00042	0.00042	0.00042	0.00042	0.00042	0.00042	0.00042
Bismuth Bi	mg/L	0.00842	0.00842	0.00842	0.00805	0.00810	0.00795	0.00805	0.00792	0.00792	0.00792	0.00792	0.00792
Boron B	mg/L	0.024	0.024	0.024	0.024	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
Cadmium Cd	mg/L	0.0000348	0.0000348	0.0000348	0.0000336	0.0000340	0.0000334	0.0000339	0.0000334	0.0000334	0.0000334	0.0000334	0.0000334
Calcium Ca	mg/L	139	139	139	133	134	132	134	132	132	132	132	132
Chromium Cr	mg/L	0.004	0.004	0.004	0.004	0.004	0.003	0.004	0.003	0.003	0.003	0.003	0.003
Cobalt Co	mg/L	0.0053	0.0053	0.0053	0.0050	0.0051	0.0050	0.0051	0.0050	0.0050	0.0050	0.0050	0.0050
Copper Cu	mg/L	0.0051	0.0051	0.0051	0.0050	0.0050	0.0049	0.0050	0.0049	0.0049	0.0049	0.0049	0.0049
Iron Fe	mg/L	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Lead Pb	mg/L	0.00027	0.00027	0.00027	0.00026	0.00027	0.00026	0.00027	0.00026	0.00026	0.00026	0.00026	0.00026
Lithium Li	mg/L	0.0043	0.0043	0.0043	0.0043	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044
Magnesium Mg	mg/L	7.1	7.1	7.1	7.0	7.2	7.1	7.3	7.2	7.2	7.2	7.2	7.2
Manganese Mn	mg/L	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015
Mercury Hg	mg/L	0.0000046	0.0000046	0.0000046	0.0000050	0.0000053	0.0000052	0.0000054	0.0000054	0.0000054	0.0000054	0.0000054	0.0000054
Molybdenum Mo	mg/L	0.00448	0.00448	0.00448	0.00429	0.00432	0.00424	0.00430	0.00423	0.00423	0.00423	0.00423	0.00423
Nickel Ni	mg/L	0.0046	0.0046	0.0046	0.0044	0.0045	0.0044	0.0045	0.0044	0.0044	0.0044	0.0044	0.0044
Phosphorus P	mg/L	0.149	0.149	0.149	0.143	0.144	0.141	0.143	0.141	0.141	0.141	0.141	0.141
Potassium K	mg/L	21.1	21.1	21.1	20.3	20.5	20.1	20.4	20.1	20.1	20.1	20.1	20.1
Selenium Se	mg/L	0.00049	0.00049	0.00049	0.00051	0.00054	0.00053	0.00055	0.00054	0.00054	0.00054	0.00054	0.00054
Silicon SiO2	mg/L	2.48	2.48	2.48	2.42	2.46	2.42	2.46	2.43	2.43	2.43	2.43	2.43
Silver Ag	mg/L	0.0001047	0.0001047	0.0001047	0.0001045	0.0001072	0.0001053	0.0001068	0.0001050	0.0001050	0.0001050	0.0001050	0.0001050
Sodium Na	mg/L	116	116	116	113	114	112	114	113	113	113	113	113
Strontium Sr	mg/L	0.057	0.057	0.057	0.055	0.057	0.056	0.057	0.056	0.056	0.056	0.056	0.056
Tellurium Te	mg/L	0.037	0.037	0.037	0.038	0.039	0.039	0.040	0.039	0.039	0.039	0.039	0.039
Thallium Tl	mg/L	0.000038	0.000038	0.000038	0.000037	0.000038	0.000038	0.000038	0.000038	0.000038	0.000038	0.000038	0.000038
Thorium Th	mg/L	0.000025	0.000025	0.000025	0.000026	0.000027	0.000027	0.000028	0.000027	0.000027	0.000027	0.000027	0.000027
Tin Sn	mg/L	0.00142	0.00142	0.00142	0.00136	0.00138	0.00135	0.00137	0.00135	0.00135	0.00135	0.00135	0.00135
Titanium Ti	mg/L	0.0057	0.0057	0.0057	0.0061	0.0064	0.0064	0.0066	0.0065	0.0065	0.0065	0.0065	0.0065
Uranium U	mg/L	0.000058	0.000058	0.000058	0.000059	0.000060	0.000060	0.000061	0.000060	0.000060	0.000060	0.000060	0.000060
Vanadium V	mg/L	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023
Zinc Zn	mg/L	0.0127	0.0127	0.0127	0.0122	0.0123	0.0121	0.0123	0.0121	0.0121	0.0121	0.0121	0.0121
Zirconium Zr	mg/L	0.0042	0.0042	0.0042	0.0042	0.0043	0.0043	0.0044	0.0043	0.0043	0.0043	0.0043	0.0043

Table H-2-A-2
Scenario 2

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE										
Date		Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16
Parameter												
TDS	mg/L	617	617	617	595	601	590	599	593	589	589	589
TSS	mg/L	3.1	3.1	3.1	3.2	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Free CN	mg/L											
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L											
CNO	mg/L											
SCN	mg/L	0.046	0.046	0.046	0.044	0.044	0.043	0.044	0.043	0.043	0.043	0.043
Sulphate	mg/L	46.3	46.3	46.3	44.3	44.6	43.8	44.4	44.0	43.7	43.7	43.7
Chloride	mg/L	401	401	401	386	391	384	390	386	383	383	383
Total Ammonia	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nitrate	mg/L	1.81	1.78	1.74	1.66	1.67	1.64	1.66	1.64	1.59	1.56	1.52
Nitrite	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alkalinity	mg/L	40	40	40	39	40	39	40	40	39	39	39
OrthoPhosphate-P	mg/L	0.0906	0.0906	0.0906	0.0867	0.0872	0.0856	0.0868	0.0859	0.0854	0.0854	0.0854
Phosphate-P	mg/L	0.0964	0.0964	0.0964	0.0930	0.0939	0.0923	0.0936	0.0927	0.0921	0.0921	0.0921
Org. Carbon	mg/L	4.8	4.8	4.8	4.8	5.0	4.9	5.0	5.0	4.9	4.9	4.9
Hardness CaCO3	mg/L	69	69	69	68	69	68	69	68	68	68	68
Total Metals												
Aluminum Al	mg/L	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Antimony Sb	mg/L	0.0083	0.0083	0.0083	0.0080	0.0080	0.0079	0.0080	0.0079	0.0079	0.0079	0.0079
Arsenic As	mg/L	0.0016	0.0016	0.0016	0.0015	0.0016	0.0015	0.0016	0.0016	0.0015	0.0015	0.0015
Barium Ba	mg/L	0.0060	0.0060	0.0060	0.0058	0.0059	0.0058	0.0059	0.0058	0.0058	0.0058	0.0058
Beryllium Be	mg/L	0.00042	0.00042	0.00042	0.00041	0.00041	0.00040	0.00041	0.00041	0.00040	0.00040	0.00040
Bismuth Bi	mg/L	0.00792	0.00792	0.00792	0.00757	0.00762	0.00748	0.00758	0.00750	0.00745	0.00745	0.00745
Boron B	mg/L	0.025	0.025	0.025	0.025	0.026	0.026	0.027	0.026	0.026	0.026	0.026
Cadmium Cd	mg/L	0.0000334	0.0000334	0.0000334	0.0000323	0.0000326	0.0000321	0.0000326	0.0000323	0.0000320	0.0000320	0.0000320
Calcium Ca	mg/L	132	132	132	126	127	125	126	125	124	124	124
Chromium Cr	mg/L	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Cobalt Co	mg/L	0.0050	0.0050	0.0050	0.0048	0.0048	0.0047	0.0048	0.0047	0.0047	0.0047	0.0047
Copper Cu	mg/L	0.0049	0.0049	0.0049	0.0048	0.0048	0.0048	0.0048	0.0048	0.0048	0.0048	0.0048
Iron Fe	mg/L	0.07	0.07	0.07	0.08	0.08	0.08	0.09	0.08	0.08	0.08	0.08
Lead Pb	mg/L	0.00026	0.00026	0.00026	0.00025	0.00026	0.00025	0.00026	0.00025	0.00025	0.00025	0.00025
Lithium Li	mg/L	0.0044	0.0044	0.0044	0.0044	0.0045	0.0045	0.0046	0.0045	0.0045	0.0045	0.0045
Magnesium Mg	mg/L	7.2	7.2	7.2	7.1	7.3	7.2	7.3	7.3	7.2	7.2	7.2
Manganese Mn	mg/L	0.015	0.015	0.015	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014
Mercury Hg	mg/L	0.0000054	0.0000054	0.0000054	0.0000057	0.0000060	0.0000059	0.0000061	0.0000061	0.0000061	0.0000061	0.0000061
Molybdenum Mo	mg/L	0.00423	0.00423	0.00423	0.00406	0.00409	0.00401	0.00407	0.00403	0.00400	0.00400	0.00400
Nickel Ni	mg/L	0.0044	0.0044	0.0044	0.0042	0.0043	0.0042	0.0042	0.0042	0.0042	0.0042	0.0042
Phosphorus P	mg/L	0.141	0.141	0.141	0.135	0.136	0.133	0.135	0.134	0.133	0.133	0.133
Potassium K	mg/L	20.1	20.1	20.1	19.4	19.5	19.2	19.5	19.3	19.2	19.2	19.2
Selenium Se	mg/L	0.00054	0.00054	0.00054	0.00056	0.00058	0.00058	0.00059	0.00059	0.00059	0.00059	0.00059
Silicon SiO2	mg/L	2.43	2.43	2.43	2.37	2.41	2.37	2.42	2.39	2.38	2.38	2.38
Silver Ag	mg/L	0.0001050	0.0001050	0.0001050	0.0001048	0.0001075	0.0001055	0.0001070	0.0001060	0.0001053	0.0001053	0.0001053
Sodium Na	mg/L	113	113	113	109	111	109	111	110	109	109	109
Strontium Sr	mg/L	0.056	0.056	0.056	0.055	0.056	0.055	0.056	0.056	0.055	0.055	0.055
Tellurium Te	mg/L	0.039	0.039	0.039	0.039	0.041	0.040	0.041	0.041	0.040	0.040	0.040
Thallium Tl	mg/L	0.000038	0.000038	0.000038	0.000037	0.000038	0.000038	0.000039	0.000038	0.000038	0.000038	0.000038
Thorium Th	mg/L	0.000027	0.000027	0.000027	0.000028	0.000029	0.000029	0.000030	0.000029	0.000029	0.000029	0.000029
Tin Sn	mg/L	0.00135	0.00135	0.00135	0.00130	0.00131	0.00129	0.00131	0.00130	0.00129	0.00129	0.00129
Titanium Ti	mg/L	0.0065	0.0065	0.0065	0.0069	0.0072	0.0072	0.0074	0.0073	0.0073	0.0073	0.0073
Uranium U	mg/L	0.000060	0.000060	0.000060	0.000060	0.000062	0.000061	0.000062	0.000062	0.000062	0.000062	0.000062
Vanadium V	mg/L	0.0023	0.0023	0.0023	0.0022	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023
Zinc Zn	mg/L	0.0121	0.0121	0.0121	0.0116	0.0117	0.0115	0.0118	0.0117	0.0116	0.0116	0.0116
Zirconium Zr	mg/L	0.0043	0.0043	0.0043	0.0043	0.0044	0.0044	0.0045	0.0045	0.0044	0.0044	0.0044

Table H 2-A-3
Scenario 2

Loadings to Tail Lake (kg/month)												
Date	Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter												
TDS	81148	78530	81148	117442	100848	86227	86140	83147	78530	81148	81148	73295
TSS	183	177	183	1239	676	336	368	233	177	183	183	166
Free CN	1.10	1.06	1.10	1.06	1.10	1.10	1.06	1.10	1.06	1.10	1.10	0.99
Total CN	11	10	11	11	11	11	10	11	10	11	11	10
WAD CN	1.47	1.42	1.47	1.42	1.47	1.47	1.42	1.47	1.42	1.47	1.47	1.32
CNO	1210	1171	1210	1171	1210	1210	1171	1210	1171	1210	1210	1093
SCN	16	16	16	16	16	16	16	16	16	16	16	15
Sulphate	14302	13840	14302	18322	17066	15395	15291	14792	13840	14302	14302	12918
Chloride	49110	47526	49110	82360	70919	57259	58093	52595	47526	49110	49110	44357
Total Ammonia	149	145	149	288	238	187	194	166	145	149	149	135
Nitrate	758	733	758	1855	1453	1051	1108	888	733	758	758	684
Nitrite	116	112	116	139	132	123	121	119	112	116	116	105
Alkalinity	6928	6704	6928	15548	12017	8299	8290	7344	6704	6928	6928	6257
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	24	22	22	21	21	21	21	21	19
Org. Carbon				2122.46	1149.16	304.79	317.09	83.28				
Hardness CaCO3	14992	14508	14992	26182	22051	16871	16918	15625	14508	14992	14992	13541
Total Metals												
Aluminum Al	4.47	4.33	4.47	19.31	12.05	9.18	8.79	5.91	4.33	4.47	4.47	4.04
Antimony Sb	1.32	1.28	1.32	4.67	3.44	2.22	2.44	1.72	1.28	1.32	1.32	1.19
Arsenic As	0.39	0.38	0.39	0.69	0.59	0.47	0.47	0.43	0.38	0.39	0.39	0.36
Barium Ba	1.56	1.51	1.56	2.29	2.00	1.75	1.72	1.62	1.51	1.56	1.56	1.41
Beryllium Be	0.05	0.05	0.05	0.23	0.15	0.08	0.09	0.06	0.05	0.05	0.05	0.04
Bismuth Bi	1.23	1.19	1.23	4.55	3.31	2.10	2.31	1.62	1.19	1.23	1.23	1.11
Boron B	2.80	2.71	2.80	10.30	7.34	4.48	4.70	3.42	2.71	2.80	2.80	2.53
Cadmium Cd	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Calcium Ca	40484	39178	40484	42156	42150	41148	39979	40728	39178	40484	40484	36566
Chromium Cr	1.02	0.99	1.02	1.32	1.26	1.11	1.06	1.04	0.99	1.02	1.02	0.92
Cobalt Co	1.67	1.62	1.67	1.85	1.81	1.73	1.69	1.70	1.62	1.67	1.67	1.51
Copper Cu	1.46	1.41	1.46	1.84	1.69	1.52	1.49	1.48	1.41	1.46	1.46	1.32
Iron Fe	4.63	4.48	4.63	21.53	11.57	9.20	9.28	5.96	4.48	4.63	4.63	4.18
Lead Pb	0.05	0.05	0.05	0.13	0.10	0.07	0.07	0.06	0.05	0.05	0.05	0.04
Lithium Li	0.46	0.45	0.46	1.84	1.14	0.69	0.73	0.54	0.45	0.46	0.46	0.42
Magnesium Mg	1082	1047	1082	2866	2073	1453	1457	1200	1047	1082	1082	977
Manganese Mn	4.56	4.41	4.56	5.17	4.97	4.80	4.75	4.66	4.41	4.56	4.56	4.12
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	1.48	1.43	1.48	1.50	1.52	1.49	1.45	1.48	1.43	1.48	1.48	1.34
Nickel Ni	1.26	1.22	1.26	1.77	1.58	1.38	1.37	1.31	1.22	1.26	1.26	1.14
Phosphorus P	33	32	33	45	40	36	36	35	32	33	33	30
Potassium K	6696	6480	6696	7119	7030	6791	6626	6737	6480	6696	6696	6048
Selenium Se	0.04	0.04	0.04	0.21	0.12	0.06	0.07	0.05	0.04	0.04	0.04	0.03
Silicon SiO2	556	538	556	963	770	630	631	583	538	556	556	502
Silver Ag	0.01	0.01	0.01	0.06	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sodium Na	6353	6148	6353	11746	9467	7284	7317	6662	6148	6353	6353	5739
Strontium Sr	12	12	12	21	18	14	14	13	12	12	12	11
Tellurium Te	0.02	0.02	0.02	17.74	8.25	2.57	3.20	0.86	0.02	0.02	0.02	0.02
Thallium Tl	0.00	0.00	0.00	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.02	0.01	0.00	0.01	0.00				
Tin Sn	0.18	0.18	0.18	0.74	0.56	0.34	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.10	0.09	0.10	2.42	1.21	0.45	0.54	0.22	0.09	0.10	0.10	0.09
Uranium U	0.00	0.00	0.00	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.36	0.35	0.36	1.09	0.79	0.52	0.54	0.43	0.35	0.36	0.36	0.33
Zinc Zn	3.5	3.4	3.5	4.4	4.1	3.8	4.2	3.7	3.4	3.5	3.5	3.2
Zirconium Zr				2.10	1.03	0.34	0.43	0.12				

Table H 2-A-3
Scenario 2

Loadings to Tail Lake (kg/month)												
Date	Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter												
TDS	81148	78530	81148	115712	100109	86048	85877	83080	78530	81148	81148	73295
TSS	183	177	183	1191	657	330	361	232	177	183	183	166
Free CN	1.10	1.06	1.10	1.06	1.10	1.10	1.06	1.10	1.06	1.10	1.10	0.99
Total CN	11	10	11	11	11	11	10	11	10	11	11	10
WAD CN	1.47	1.42	1.47	1.42	1.47	1.47	1.42	1.47	1.42	1.47	1.47	1.32
CNO	1210	1171	1210	1171	1210	1210	1171	1210	1171	1210	1210	1093
SCN	16	16	16	16	16	16	16	16	16	16	16	15
Sulphate	14302	13840	14302	18291	17050	15391	15284	14790	13840	14302	14302	12918
Chloride	49110	47526	49110	81904	70673	57198	58011	52574	47526	49110	49110	44357
Total Ammonia	149	145	149	288	238	187	194	166	145	149	149	135
Nitrate	758	733	758	1855	1453	1051	1108	888	733	758	758	684
Nitrite	116	112	116	139	132	123	121	119	112	116	116	105
Alkalinity	6928	6704	6928	15155	11826	8251	8235	7330	6704	6928	6928	6257
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	24	22	22	21	21	21	21	21	19
Org. Carbon				2028.11	1106.10	294.04	306.11	80.51				
Hardness CaCO3	14992	14508	14992	25663	21786	16805	16835	15604	14508	14992	14992	13541
Total Metals												
Aluminum Al	4.47	4.33	4.47	19.05	11.98	9.10	8.74	5.89	4.33	4.47	4.47	4.04
Antimony Sb	1.32	1.28	1.32	4.67	3.44	2.22	2.44	1.72	1.28	1.32	1.32	1.19
Arsenic As	0.39	0.38	0.39	0.69	0.59	0.47	0.47	0.43	0.38	0.39	0.39	0.36
Barium Ba	1.56	1.51	1.56	2.26	1.98	1.75	1.72	1.62	1.51	1.56	1.56	1.41
Beryllium Be	0.05	0.05	0.05	0.23	0.15	0.08	0.09	0.06	0.05	0.05	0.05	0.04
Bismuth Bi	1.23	1.19	1.23	4.55	3.31	2.10	2.31	1.62	1.19	1.23	1.23	1.11
Boron B	2.80	2.71	2.80	10.12	7.25	4.45	4.67	3.41	2.71	2.80	2.80	2.53
Cadmium Cd	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Calcium Ca	40484	39178	40484	42075	42114	41135	39965	40724	39178	40484	40484	36566
Chromium Cr	1.02	0.99	1.02	1.31	1.26	1.11	1.06	1.04	0.99	1.02	1.02	0.92
Cobalt Co	1.67	1.62	1.67	1.85	1.81	1.73	1.69	1.70	1.62	1.67	1.67	1.51
Copper Cu	1.46	1.41	1.46	1.83	1.68	1.52	1.49	1.48	1.41	1.46	1.46	1.32
Iron Fe	4.63	4.48	4.63	20.87	11.36	9.06	9.14	5.92	4.48	4.63	4.63	4.18
Lead Pb	0.05	0.05	0.05	0.13	0.10	0.07	0.07	0.06	0.05	0.05	0.05	0.04
Lithium Li	0.46	0.45	0.46	1.79	1.12	0.68	0.72	0.54	0.45	0.46	0.46	0.42
Magnesium Mg	1082	1047	1082	2802	2045	1443	1447	1198	1047	1082	1082	977
Manganese Mn	4.56	4.41	4.56	5.16	4.96	4.80	4.74	4.66	4.41	4.56	4.56	4.12
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	1.48	1.43	1.48	1.50	1.52	1.49	1.45	1.48	1.43	1.48	1.48	1.34
Nickel Ni	1.26	1.22	1.26	1.76	1.57	1.38	1.36	1.31	1.22	1.26	1.26	1.14
Phosphorus P	33	32	33	45	40	36	36	35	32	33	33	30
Potassium K	6696	6480	6696	7094	7019	6789	6622	6736	6480	6696	6696	6048
Selenium Se	0.04	0.04	0.04	0.20	0.12	0.06	0.07	0.05	0.04	0.04	0.04	0.03
Silicon SiO2	556	538	556	949	764	628	629	583	538	556	556	502
Silver Ag	0.01	0.01	0.01	0.06	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sodium Na	6353	6148	6353	11499	9351	7252	7277	6652	6148	6353	6353	5739
Strontium Sr	12	12	12	20	17	14	14	13	12	12	12	11
Tellurium Te	0.02	0.02	0.02	16.95	7.94	2.48	3.09	0.83	0.02	0.02	0.02	0.02
Thallium Tl	0.00	0.00	0.00	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.02	0.01	0.00	0.01	0.00				
Tin Sn	0.18	0.18	0.18	0.74	0.56	0.33	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.10	0.09	0.10	2.32	1.17	0.44	0.53	0.22	0.09	0.10	0.10	0.09
Uranium U	0.00	0.00	0.00	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.36	0.35	0.36	1.08	0.79	0.52	0.54	0.43	0.35	0.36	0.36	0.33
Zinc Zn	3.5	3.4	3.5	4.4	4.1	3.8	4.1	3.7	3.4	3.5	3.5	3.2
Zirconium Zr				2.02	1.00	0.33	0.42	0.12				

Table H 2-A-3
Scenario 2

Loadings to Tail Lake (kg/month)												
Date	Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter												
TDS	50662	49028	50662	85311	69216	55462	56228	52557	49028	50662	50662	45759
TSS				990	464	144	180	47				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate	1289	1247	1289	5581	3967	2350	2654	1765	1247	1289	1289	1164
Chloride	49110	47526	49110	81667	70537	57164	57966	52563	47526	49110	49110	44357
Total Ammonia	25	24	25	153	104	58	68	40	24	25	25	22
Nitrate	29	28	29	1036	654	292	365	147	28	29	29	26
Nitrite	64	62	64	86	79	71	70	67	62	64	64	58
Alkalinity				8246	4793	1296	1500	395				
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	24	22	22	21	21	21	21	21	19
Org. Carbon				1979.12	1082.35	288.03	300.01	78.97				
Hardness CaCO3				10885	6649	1776	2280	600				
Total Metals												
Aluminum Al	0.81	0.78	0.81	12.42	6.44	4.62	4.18	1.88	0.78	0.81	0.81	0.73
Antimony Sb	1.21	1.17	1.21	4.55	3.32	2.11	2.33	1.61	1.17	1.21	1.21	1.09
Arsenic As	0.03	0.03	0.03	0.27	0.18	0.08	0.10	0.05	0.03	0.03	0.03	0.02
Barium Ba	0.06	0.06	0.06	0.79	0.47	0.24	0.26	0.12	0.06	0.06	0.06	0.05
Beryllium Be	0.03	0.03	0.03	0.20	0.12	0.06	0.06	0.04	0.03	0.03	0.03	0.03
Bismuth Bi	1.21	1.17	1.21	4.52	3.28	2.08	2.29	1.60	1.17	1.21	1.21	1.09
Boron B	0.60	0.58	0.60	7.20	4.57	2.06	2.30	1.13	0.58	0.60	0.60	0.55
Cadmium Cd	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Calcium Ca	263	254	263	2936	1766	861	975	480	254	263	263	237
Chromium Cr	0.07	0.06	0.07	0.37	0.30	0.16	0.13	0.09	0.06	0.07	0.07	0.06
Cobalt Co	0.06	0.06	0.06	0.28	0.19	0.11	0.13	0.08	0.06	0.06	0.06	0.05
Copper Cu	0.03	0.03	0.03	0.42	0.24	0.09	0.10	0.05	0.03	0.03	0.03	0.03
Iron Fe	0.23	0.23	0.23	15.58	6.42	4.40	4.57	1.42	0.23	0.23	0.23	0.21
Lead Pb	0.01	0.01	0.01	0.08	0.05	0.03	0.03	0.02	0.01	0.01	0.01	0.01
Lithium Li	0.06	0.06	0.06	1.36	0.70	0.27	0.32	0.14	0.06	0.06	0.06	0.05
Magnesium Mg	121	117	121	1822	1058	473	507	234	117	121	121	110
Manganese Mn	0.16	0.15	0.16	0.88	0.55	0.39	0.47	0.26	0.15	0.16	0.16	0.14
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	0.01	0.01	0.01	0.08	0.05	0.02	0.03	0.02	0.01	0.01	0.01	0.01
Nickel Ni	0.12	0.12	0.12	0.64	0.42	0.24	0.26	0.17	0.12	0.12	0.12	0.11
Phosphorus P	23	22	23	33	29	25	25	24	22	23	23	21
Potassium K	25	24	25	621	340	115	162	64	24	25	25	23
Selenium Se	0.00	0.00	0.00	0.15	0.07	0.02	0.03	0.01	0.00	0.00	0.00	0.00
Silicon SiO2	10	9	10	380	195	72	88	33	9	10	10	9
Silver Ag	0.00	0.00	0.00	0.05	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Sodium Na	12	12	12	5230	2943	891	1117	304	12	12	12	11
Strontium Sr	0	0	0	9	5	2	2	1	0	0	0	0
Tellurium Te				16.51	7.74	2.41	3.01	0.79				
Thallium Tl	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn	0.18	0.18	0.18	0.73	0.55	0.33	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.06	0.06	0.06	2.22	1.10	0.40	0.48	0.18	0.06	0.06	0.06	0.05
Uranium U	0.00	0.00	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.18	0.18	0.18	0.87	0.59	0.33	0.36	0.24	0.18	0.18	0.18	0.16
Zinc Zn	0.2	0.2	0.2	1.1	0.8	0.5	0.9	0.4	0.2	0.2	0.2	0.2
Zirconium Zr				1.85	0.90	0.29	0.37	0.10				

Table H 2-A-3
Scenario 2

Loadings to Tail Lake (kg/month)												
Date	Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter												
TDS				35824	18335	4745	7119	1874				
TSS				977	458	142	178	47				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				788	479	136	222	63				
Chloride				9445	6112	1613	2195	578				
Total Ammonia				61	37	16	21	7				
Nitrate				470	291	122	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				8142	4737	1281	1483	391				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1954.05	1069.54	284.73	296.63	78.10				
Hardness CaCO3				10747	6570	1756	2254	594				
Total Metals												
Aluminum Al				9.66	4.43	3.29	2.74	0.85				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.16	0.10	0.04	0.04	0.01				
Barium Ba				0.55	0.30	0.13	0.14	0.04				
Beryllium Be				0.08	0.04	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				4.91	2.91	1.01	1.15	0.33				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				1938	1045	406	475	132				
Chromium Cr				0.14	0.13	0.05	0.01	0.00				
Cobalt Co				0.05	0.03	0.01	0.01	0.00				
Copper Cu				0.32	0.17	0.04	0.05	0.01				
Iron Fe				14.68	5.82	3.99	4.14	1.12				
Lead Pb				0.04	0.02	0.01	0.01	0.00				
Lithium Li				1.12	0.53	0.17	0.21	0.05				
Magnesium Mg				1354	722	261	275	73				
Manganese Mn				0.28	0.12	0.12	0.17	0.05				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.19	0.10	0.03	0.03	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				521	268	71	113	30				
Selenium Se				0.15	0.07	0.02	0.03	0.01				
Silicon SiO2				341	167	55	69	20				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				5119	2876	861	1082	285				
Strontium Sr				7	4	1	2	0				
Tellurium Te				16.30	7.65	2.38	2.97	0.78				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.05	0.06	0.02	0.02	0.01				
Titanium Ti				1.97	0.93	0.29	0.36	0.10				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.20	0.10	0.02	0.01	0.00				
Zinc Zn				0.4	0.2	0.1	0.5	0.1				
Zirconium Zr				1.83	0.89	0.29	0.36	0.10				

Table H 2-A-3
Scenario 2

Loadings to Tail Lake (kg/month)												
Date	Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter												
TDS				35462	18155	4699	7050	1856				
TSS				967	454	141	176	46				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				782	475	135	220	62				
Chloride				9349	6052	1598	2174	572				
Total Ammonia				61	37	16	21	7				
Nitrate				470	291	122	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				8060	4690	1269	1469	387				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1934.32	1059.04	281.96	293.75	77.35				
Hardness CaCO3				10639	6506	1739	2232	588				
Total Metals												
Aluminum Al				9.61	4.41	3.27	2.73	0.84				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.16	0.10	0.04	0.04	0.01				
Barium Ba				0.55	0.30	0.13	0.14	0.04				
Beryllium Be				0.08	0.04	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				4.87	2.89	1.00	1.14	0.33				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				1921	1036	403	471	131				
Chromium Cr				0.14	0.12	0.05	0.01	0.00				
Cobalt Co				0.05	0.03	0.01	0.01	0.00				
Copper Cu				0.32	0.17	0.04	0.05	0.01				
Iron Fe				14.54	5.76	3.95	4.10	1.11				
Lead Pb				0.04	0.02	0.01	0.01	0.00				
Lithium Li				1.11	0.52	0.16	0.20	0.05				
Magnesium Mg				1341	715	259	272	72				
Manganese Mn				0.28	0.12	0.11	0.17	0.05				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.19	0.09	0.03	0.03	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				516	266	70	112	30				
Selenium Se				0.15	0.07	0.02	0.03	0.01				
Silicon SiO2				338	166	55	69	19				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				5068	2848	852	1071	282				
Strontium Sr				7	4	1	2	0				
Tellurium Te				16.14	7.58	2.35	2.94	0.78				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.05	0.06	0.02	0.02	0.01				
Titanium Ti				1.95	0.92	0.29	0.36	0.10				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.19	0.10	0.02	0.01	0.00				
Zinc Zn				0.4	0.2	0.1	0.5	0.1				
Zirconium Zr				1.81	0.88	0.29	0.36	0.10				

Table H 2-A-3
Scenario 2

Loadings to Tail Lake (kg/month)												
Date	Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter												
TDS				35119	17981	4654	6983	1839				
TSS				958	450	140	175	46				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				776	472	134	218	62				
Chloride				9259	5994	1583	2153	567				
Total Ammonia				61	37	16	21	7				
Nitrate				469	291	122	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				7982	4645	1257	1455	383				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1915.59	1048.87	279.26	290.95	76.61				
Hardness CaCO3				10536	6443	1722	2211	582				
Total Metals												
Aluminum Al				9.55	4.40	3.25	2.72	0.84				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.16	0.10	0.04	0.04	0.01				
Barium Ba				0.54	0.30	0.13	0.14	0.04				
Beryllium Be				0.08	0.04	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				4.83	2.87	1.00	1.13	0.33				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				1905	1028	399	468	130				
Chromium Cr				0.14	0.12	0.04	0.01	0.00				
Cobalt Co				0.05	0.03	0.01	0.01	0.00				
Copper Cu				0.31	0.17	0.04	0.05	0.01				
Iron Fe				14.41	5.71	3.92	4.06	1.10				
Lead Pb				0.04	0.02	0.01	0.01	0.00				
Lithium Li				1.10	0.52	0.16	0.20	0.05				
Magnesium Mg				1328	708	257	270	72				
Manganese Mn				0.28	0.12	0.11	0.17	0.04				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.19	0.09	0.03	0.03	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				511	263	70	111	29				
Selenium Se				0.15	0.07	0.02	0.03	0.01				
Silicon SiO2				335	164	54	68	19				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				5019	2821	844	1061	280				
Strontium Sr				7	4	1	2	0				
Tellurium Te				15.98	7.50	2.33	2.92	0.77				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.05	0.06	0.02	0.02	0.01				
Titanium Ti				1.94	0.91	0.28	0.36	0.09				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.19	0.10	0.02	0.01	0.00				
Zinc Zn				0.4	0.2	0.1	0.5	0.1				
Zirconium Zr				1.79	0.87	0.28	0.36	0.10				

Table H 2-A-3
Scenario 2

Loadings to Tail Lake (kg/month)												
Date	Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter												
TDS				34781	17807	4610	6916	1821				
TSS				949	445	138	173	46				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				623	377	94	168	44				
Chloride				9170	5936	1567	2132	561				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				7905	4600	1245	1441	379				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1897.16	1038.72	276.57	288.16	75.87				
Hardness CaCO3				10434	6381	1706	2190	577				
Total Metals												
Aluminum Al				5.22	1.72	2.11	1.27	0.34				
Antimony Sb				0.04	0.04	0.03	0.04	0.01				
Arsenic As				0.06	0.04	0.01	0.01	0.00				
Barium Ba				0.52	0.29	0.13	0.13	0.04				
Beryllium Be				0.06	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.00	0.00	0.00	0.00				
Boron B				3.79	2.23	0.73	0.79	0.21				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				1638	864	331	380	100				
Chromium Cr				0.12	0.11	0.04	0.01	0.00				
Cobalt Co				0.03	0.01	0.00	0.01	0.00				
Copper Cu				0.28	0.15	0.03	0.04	0.01				
Iron Fe				13.28	5.05	3.62	3.69	0.97				
Lead Pb				0.02	0.01	0.00	0.00	0.00				
Lithium Li				1.07	0.50	0.16	0.19	0.05				
Magnesium Mg				1290	686	248	259	68				
Manganese Mn				0.25	0.10	0.11	0.16	0.04				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.16	0.08	0.02	0.02	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				500	257	67	108	28				
Selenium Se				0.13	0.06	0.02	0.02	0.00				
Silicon SiO2				285	134	41	52	14				
Silver Ag				0.03	0.01	0.00	0.00	0.00				
Sodium Na				4964	2790	834	1049	276				
Strontium Sr				7	4	1	2	0				
Tellurium Te				15.81	7.42	2.30	2.88	0.76				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th												
Tin Sn				0.03	0.04	0.01	0.02	0.00				
Titanium Ti				1.90	0.89	0.28	0.35	0.09				
Uranium U				0.02	0.01	0.00	0.00	0.00				
Vanadium V				0.15	0.07	0.01	0.00	0.00				
Zinc Zn				0.3	0.1	0.1	0.5	0.1				
Zirconium Zr				1.58	0.74	0.23	0.29	0.08				

Table H 2-A-3
Scenario 2

Loadings to Tail Lake (kg/month)												
Date	Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter												
TDS				412653	395842	382791	385082	380021				
TSS				1523	714	223	278	73				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				617	373	94	167	44				
Chloride				255283	243688	234261	235402	231711				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				7827	4554	1236	1431	377				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				7	3	1	1	0				
Org. Carbon				1878.57	1028.37	274.71	286.23	75.36				
Hardness CaCO3				10332	6317	1694	2175	573				
Total Metals												
Aluminum Al				55.74	25.43	9.49	10.51	2.77				
Antimony Sb				0.05	0.04	0.03	0.04	0.01				
Arsenic As				0.15	0.08	0.02	0.03	0.01				
Barium Ba				0.52	0.28	0.12	0.13	0.03				
Beryllium Be				0.06	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.01	0.00	0.00	0.00				
Boron B				10.07	5.16	1.65	1.94	0.51				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				24376	23355	22673	22740	22397				
Chromium Cr				0.22	0.16	0.05	0.02	0.01				
Cobalt Co				0.06	0.03	0.01	0.01	0.00				
Copper Cu				0.44	0.22	0.06	0.07	0.02				
Iron Fe				62.31	28.06	10.79	12.66	3.33				
Lead Pb				0.03	0.01	0.00	0.00	0.00				
Lithium Li				1.52	0.71	0.22	0.28	0.07				
Magnesium Mg				1949	994	344	380	100				
Manganese Mn				1.42	0.65	0.28	0.37	0.10				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.10	0.05	0.01	0.02	0.00				
Nickel Ni				0.21	0.10	0.03	0.03	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				1021	501	144	203	54				
Selenium Se				0.33	0.16	0.05	0.06	0.01				
Silicon SiO2				405	190	59	74	20				
Silver Ag				0.03	0.02	0.00	0.00	0.00				
Sodium Na				139847	132711	127746	128303	126271				
Strontium Sr				10	6	2	2	1				
Tellurium Te				15.66	7.35	2.29	2.86	0.75				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.04	0.05	0.01	0.02	0.00				
Titanium Ti				4.75	2.23	0.69	0.87	0.23				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.57	0.27	0.07	0.08	0.02				
Zinc Zn				0.5	0.2	0.1	0.5	0.1				
Zirconium Zr				1.58	0.74	0.23	0.29	0.08				

Table H 2-A-3
Scenario 2

Loadings to Tail Lake (kg/month)												
Date	Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter												
TDS				34270	17648	4569	6865	1807				
TSS				1515	715	222	278	73				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				614	374	94	166	44				
Chloride				24767	13309	3860	5006	1318				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				7789	4559	1233	1430	377				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				7	3	1	1	0				
Org. Carbon				1869.25	1029.46	274.11	286.05	75.31				
Hardness CaCO3				10281	6324	1690	2174	572				
Total Metals												
Aluminum Al				55.46	25.46	9.47	10.51	2.77				
Antimony Sb				0.05	0.04	0.03	0.04	0.01				
Arsenic As				0.15	0.08	0.02	0.03	0.01				
Barium Ba				0.52	0.28	0.12	0.13	0.03				
Beryllium Be				0.06	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.01	0.00	0.00	0.00				
Boron B				10.02	5.17	1.64	1.94	0.51				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				2091	1081	398	465	122				
Chromium Cr				0.21	0.16	0.05	0.02	0.01				
Cobalt Co				0.06	0.03	0.01	0.01	0.00				
Copper Cu				0.44	0.22	0.06	0.07	0.02				
Iron Fe				62.01	28.09	10.76	12.65	3.33				
Lead Pb				0.03	0.01	0.00	0.00	0.00				
Lithium Li				1.51	0.71	0.22	0.28	0.07				
Magnesium Mg				1939	995	343	380	100				
Manganese Mn				1.42	0.65	0.28	0.37	0.10				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.10	0.05	0.01	0.02	0.00				
Nickel Ni				0.21	0.10	0.03	0.03	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				1016	502	144	203	54				
Selenium Se				0.33	0.16	0.05	0.06	0.01				
Silicon SiO2				403	190	59	74	19				
Silver Ag				0.03	0.02	0.00	0.00	0.00				
Sodium Na				14231	7174	2196	2756	726				
Strontium Sr				10	6	2	2	1				
Tellurium Te				15.58	7.35	2.28	2.86	0.75				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.04	0.05	0.01	0.02	0.00				
Titanium Ti				4.72	2.23	0.69	0.87	0.23				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.57	0.27	0.07	0.08	0.02				
Zinc Zn				0.5	0.2	0.1	0.5	0.1				
Zirconium Zr				1.57	0.74	0.23	0.29	0.08				

Table H 2-A-3
Scenario 2

Loadings to Tail Lake (kg/month)												
Date	Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16	Year 10 Jan-17
Parameter												
TDS				34279	17653	4570	6867	1808				
TSS				1516	715	222	278	73				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				614	374	94	167	44				
Chloride				24774	13313	3861	5007	1318				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				7791	4560	1234	1431	377				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				7	3	1	1	0				
Org. Carbon				1869.79	1029.75	274.19	286.13	75.33				
Hardness CaCO3				10284	6326	1691	2175	573				
Total Metals												
Aluminum Al				55.48	25.47	9.47	10.51	2.77				
Antimony Sb				0.05	0.04	0.03	0.04	0.01				
Arsenic As				0.15	0.08	0.02	0.03	0.01				
Barium Ba				0.52	0.28	0.12	0.13	0.03				
Beryllium Be				0.06	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.01	0.00	0.00	0.00				
Boron B				10.02	5.17	1.64	1.94	0.51				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				2092	1082	398	465	122				
Chromium Cr				0.22	0.16	0.05	0.02	0.01				
Cobalt Co				0.06	0.03	0.01	0.01	0.00				
Copper Cu				0.44	0.22	0.06	0.07	0.02				
Iron Fe				62.02	28.10	10.77	12.65	3.33				
Lead Pb				0.03	0.01	0.00	0.00	0.00				
Lithium Li				1.51	0.71	0.22	0.28	0.07				
Magnesium Mg				1939	995	343	380	100				
Manganese Mn				1.42	0.65	0.28	0.37	0.10				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.10	0.05	0.01	0.02	0.00				
Nickel Ni				0.21	0.10	0.03	0.03	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				1017	502	144	203	54				
Selenium Se				0.33	0.16	0.05	0.06	0.01				
Silicon SiO2				403	190	59	74	19				
Silver Ag				0.03	0.02	0.00	0.00	0.00				
Sodium Na				14235	7176	2197	2757	726				
Strontium Sr				10	6	2	2	1				
Tellurium Te				15.58	7.36	2.29	2.86	0.75				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.04	0.05	0.01	0.02	0.00				
Titanium Ti				4.73	2.23	0.69	0.87	0.23				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.57	0.27	0.07	0.08	0.02				
Zinc Zn				0.5	0.2	0.1	0.5	0.1				
Zirconium Zr				1.57	0.74	0.23	0.29	0.08				

Table H-2-A-1
Scenario 2

OUTPUT SUMMARY							Fraction of CCME in Doris Creek (%)
Discharge rate		m3/year					
Degradation Field(age)		Tail Lk Cu < CME Year		35			
Maximum Concentration		MMER	CCME	Tail Lake Year 2	Doris Creek Year 9	L'Roberts L Year 9	
pH			6 to 9	7 to 8	7 to 8	7 to 8	
TDS	mg/L			652	172	178	
TSS	mg/L			4.8	7.0	8.1	
Free CN	mg/L		0.005	0.0025			
Total CN	mg/L	1.0		0.025	0.002	0.002	
WAD CN	mg/L			0.0034			
CNO	mg/L			2.8			
SCN	mg/L			0.090	0.003	0.001	
Sulphate	mg/L			83	5.5	5.8	
Chloride	mg/L			422	82	77	
Total Ammonia	mg/L		0.97	1.01	0.017	0.009	2%
Nitrate	mg/L		2.9	5.2	0.12	0.07	4%
Nitrite	mg/L		0.018	0.39	0.003	0.002	14%
Alkalinity	mg/L			52	28	26	
OrthoPhosphate-P	mg/L			0.1504	0.0059	0.0037	
Phosphate-P	mg/L			0.1537	0.0273	0.0263	
Org. Carbon	mg/L			6.4	7.5	7.1	
Hardness CaCO3	mg/L			100	47	46	
Total Metals							
Aluminum Al	mg/L		0.1	0.15	0.08	0.25	84%
Antimony Sb	mg/L			0.0138	0.0031	0.0019	
Arsenic As	mg/L	0.5	0.005	0.00	0.0005	0.0005	10%
Barium Ba	mg/L			0.0097	0.0033	0.0052	
Beryllium Be	mg/L			0.00056	0.00003	0.00002	
Bismuth Bi	mg/L			0.01323	0.00048	0.00034	
Boron B	mg/L			0.035	0.035	0.030	
Cadmium Cd	mg/L		0.000038	0.000051	0.0000039	0.0000153	10%
Calcium Ca	mg/L			225	14	11	
Chromium Cr	mg/L		0.001	0.0060	0.001	0.001	77%
Cobalt Co	mg/L			0.0094	0.0011	0.0005	
Copper Cu	mg/L	0.3	0.002	0.009	0.0017	0.0020	85%
Iron Fe	mg/L		0.3	0.17	0.13	0.28	42%
Lead Pb	mg/L	0.2	0.002	0.00038	0.00007	0.00026	3%
Lithium Li	mg/L			0.0054	0.0029	0.0029	
Magnesium Mg	mg/L			8.8	7.3	7.3	
Manganese Mn	mg/L			0.026	0.021	0.024	
Mercury Hg	mg/L		0.0001	0.0000116	0.0000012	0.0000009	1%
Molybdenum Mo	mg/L		0.073	0.0081	0.00039	0.00033	1%
Nickel Ni	mg/L	0.5	0.025	0.008	0.0007	0.0007	3%
Phosphorus P	mg/L			0.227	0.029	0.027	
Potassium K	mg/L			37	3.6	3.2	
Selenium Se	mg/L		0.001	0.00096	0.00090	0.00084	90%
Silicon SiO2	mg/L			3.6	0.61	0.57	
Silver Ag	mg/L		0.0001	0.00011	0.0000068	0.0000056	7%
Sodium Na	mg/L			117	43	40	
Strontium Sr	mg/L			0.081	0.043	0.047	
Tellurium Te	mg/L			0.052	0.050	0.052	
Thallium Tl	mg/L		0.0008	0.000041	0.000031	0.002001	4%
Thorium Th	mg/L			0.000044	0.0000025	0.0000013	
Tin Sn	mg/L			0.00209	0.00046	0.00004	
Titanium Ti	mg/L			0.0133	0.0064	0.0064	
Uranium U	mg/L			0.000077	0.000039	0.000044	
Vanadium V	mg/L			0.0031	0.0006	0.0005	
Zinc Zn	mg/L	0.5	0.03	0.021	0.0036	0.0055	12%
Zirconium Zr	mg/L			0.0055	0.0050	0.0052	

Table H-2-A-2
Scenario 2

Water Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter													
TDS	mg/L				140	121	125	145	145				
TSS	mg/L				4.0	5.9	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				2.8	2.7	2.9	3.0	3.0				
Chloride	mg/L				61	61	59	63	63				
Total Ammonia	mg/L				0.008	0.011	0.017	0.016	0.016				
Nitrate	mg/L				0.03	0.03	0.03	0.03	0.03				
Nitrite	mg/L				0.003	0.003	0.003	0.003	0.003				
Alkalinity	mg/L				28	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca	mg/L				9	8	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.024	0.020	0.020				
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.51	0.51	0.51	0.51	0.51				
Silver Ag	mg/L				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-2-A-2
Scenario 2

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter													
TDS	mg/L				140	121	125	145	145				
TSS	mg/L				4.0	5.9	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				2.8	2.7	2.9	3.0	3.0				
Chloride	mg/L				61	61	59	63	63				
Total Ammonia	mg/L				0.008	0.011	0.017	0.016	0.016				
Nitrate	mg/L				0.03	0.03	0.03	0.03	0.03				
Nitrite	mg/L				0.003	0.003	0.003	0.003	0.003				
Alkalinity	mg/L				28	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca	mg/L				9	8	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.024	0.020	0.020				
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.51	0.51	0.51	0.51	0.51				
Silver Ag	mg/L				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-2-A-2
Scenario 2

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter													
TDS	mg/L				140	121	125	145	145				
TSS	mg/L				4.0	5.9	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				2.8	2.7	2.9	3.0	3.0				
Chloride	mg/L				61	61	59	63	63				
Total Ammonia	mg/L				0.008	0.011	0.017	0.016	0.016				
Nitrate	mg/L				0.03	0.03	0.03	0.03	0.03				
Nitrite	mg/L				0.003	0.003	0.003	0.003	0.003				
Alkalinity	mg/L				28	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca	mg/L				9	8	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.024	0.020	0.020				
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.51	0.51	0.51	0.51	0.51				
Silver Ag	mg/L				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-2-A-2
Scenario 2

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter	mg/L				140	121	125	145	145				
TDS	mg/L				4.0	5.9	6.0	7.0	7.0				
TSS	mg/L												
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				2.8	2.7	2.9	3.0	3.0				
Chloride	mg/L				61	61	59	63	63				
Total Ammonia	mg/L				0.008	0.011	0.017	0.016	0.016				
Nitrate	mg/L				0.03	0.03	0.03	0.03	0.03				
Nitrite	mg/L				0.003	0.003	0.003	0.003	0.003				
Alkalinity	mg/L				28	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca	mg/L				9	8	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.024	0.020	0.020				
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.51	0.51	0.51	0.51	0.51				
Silver Ag	mg/L				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-2-A-2
Scenario 2

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter													
TDS	mg/L				140	121	125	145	145				
TSS	mg/L				4.0	5.9	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				2.8	2.7	2.9	3.0	3.0				
Chloride	mg/L				61	61	59	63	63				
Total Ammonia	mg/L				0.008	0.011	0.017	0.016	0.016				
Nitrate	mg/L				0.03	0.03	0.03	0.03	0.03				
Nitrite	mg/L				0.003	0.003	0.003	0.003	0.003				
Alkalinity	mg/L				28	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca	mg/L				9	8	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.024	0.020	0.020				
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.51	0.51	0.51	0.51	0.51				
Silver Ag	mg/L				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-2-A-2
Scenario 2

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter													
TDS	mg/L				140	121	125	145	145				
TSS	mg/L				4.0	5.9	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				2.8	2.7	2.8	3.0	3.0				
Chloride	mg/L				61	61	59	63	63				
Total Ammonia	mg/L				0.005	0.008	0.014	0.013	0.013				
Nitrate	mg/L				0.01	0.01	0.01	0.01	0.01				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				28	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00000	0.00000	0.00000	0.00000				
Bismuth Bi	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000025	0.0000025	0.0000020	0.0000020	0.0000020				
Calcium Ca	mg/L				8	8	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.024	0.020	0.020				
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000008	0.0000010	0.0000006	0.0000007	0.0000007				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L												
Tin Sn	mg/L				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000025	0.000030	0.000038	0.000031	0.000031				
Vanadium V	mg/L				0.0006	0.0000	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0032	0.0028	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-2-A-2
Scenario 2

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter													
TDS	mg/L				140	121	125	145	145				
TSS	mg/L				4.0	5.9	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				2.8	2.7	2.8	3.0	3.0				
Chloride	mg/L				61	61	59	63	63				
Total Ammonia	mg/L				0.005	0.008	0.014	0.013	0.013				
Nitrate	mg/L				0.01	0.01	0.01	0.01	0.01				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				28	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00000	0.00000	0.00000	0.00000				
Bismuth Bi	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000025	0.0000025	0.0000020	0.0000020	0.0000020				
Calcium Ca	mg/L				8	8	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.024	0.020	0.020				
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000008	0.0000010	0.0000006	0.0000007	0.0000007				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L												
Tin Sn	mg/L				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000025	0.000030	0.000038	0.000031	0.000031				
Vanadium V	mg/L				0.0006	0.0000	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0032	0.0028	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-2-A-2
Scenario 2

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter													
TDS	mg/L				140	135	125	145	145				
TSS	mg/L				4.0	5.8	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L					0.002							
Sulphate	mg/L				2.8	4.6	2.8	3.0	3.0				
Chloride	mg/L				61	70	59	63	63				
Total Ammonia	mg/L				0.005	0.008	0.014	0.013	0.013				
Nitrate	mg/L				0.01	0.10	0.01	0.01	0.01				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				28	26	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0047	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0213	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	44	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0012	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0005	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0033	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00002	0.00000	0.00000	0.00000				
Bismuth Bi	mg/L				0.00003	0.00037	0.00003	0.00003	0.00003				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000025	0.0000038	0.0000020	0.0000020	0.0000020				
Calcium Ca	mg/L				8	13	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0003	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0017	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00007	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0029	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000006	0.0000007	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00016	0.00033	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0007	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.023	0.024	0.020	0.020				
Potassium K	mg/L				2.8	3.2	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.50	0.58	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000008	0.0000052	0.0000006	0.0000007	0.0000007				
Sodium Na	mg/L				39	34	34	32	32				
Strontium Sr	mg/L				0.041	0.043	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L					0.000001							
Tin Sn	mg/L				0.00040	0.00044	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000025	0.000031	0.000038	0.000031	0.000031				
Vanadium V	mg/L				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0036	0.0028	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-2-A-2
Scenario 2

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter	mg/L				163	121	147	145	172				
TDS	mg/L				4.0	5.9	5.9	7.0	6.8				
TSS	mg/L												
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.002		0.002		0.003				
Sulphate	mg/L				4.9	2.7	4.8	3.0	5.5				
Chloride	mg/L				76	61	74	63	82				
Total Ammonia	mg/L				0.005	0.008	0.013	0.013	0.012				
Nitrate	mg/L				0.10	0.01	0.10	0.01	0.12				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				28	25	28	27	27				
OrthoPhosphate-P	mg/L				0.0050	0.0008	0.0048	0.0008	0.0059				
Phosphate-P	mg/L				0.0203	0.0179	0.0273	0.0195	0.0239				
Org. Carbon	mg/L				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3	mg/L				47	43	44	44	45				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0007	0.0008	0.0031	0.0005	0.0009				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0030	0.0032	0.0031	0.0031	0.0033				
Beryllium Be	mg/L				0.00002	0.00000	0.00002	0.00000	0.00003				
Bismuth Bi	mg/L				0.00040	0.00003	0.00038	0.00003	0.00048				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000039	0.0000025	0.0000034	0.0000020	0.0000038				
Calcium Ca	mg/L				14	8	13	7	14				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0003	0.0001	0.0011	0.0001	0.0004				
Copper Cu	mg/L				0.0014	0.0015	0.0014	0.0015	0.0017				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00003	0.00006	0.00005	0.00004	0.00005				
Lithium Li	mg/L				0.0029	0.0028	0.0029	0.0028	0.0029				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000008	0.0000006	0.0000008	0.0000006	0.0000009				
Molybdenum Mo	mg/L				0.00035	0.00015	0.00036	0.00016	0.00039				
Nickel Ni	mg/L				0.0006	0.0006	0.0006	0.0004	0.0007				
Phosphorus P	mg/L				0.022	0.018	0.029	0.020	0.026				
Potassium K	mg/L				3.6	2.4	3.2	2.3	3.4				
Selenium Se	mg/L				0.00088	0.00057	0.00061	0.00056	0.00056				
Silicon SiO2	mg/L				0.59	0.50	0.59	0.50	0.61				
Silver Ag	mg/L				0.0000054	0.0000010	0.0000053	0.0000007	0.0000067				
Sodium Na	mg/L				43	33	38	32	37				
Strontium Sr	mg/L				0.041	0.042	0.037	0.040	0.041				
Tellurium Te	mg/L				0.049	0.050	0.050	0.050	0.049				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000001		0.000001		0.000002				
Tin Sn	mg/L				0.00045	0.00040	0.00044	0.00040	0.00046				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000030	0.000039	0.000031	0.000033				
Vanadium V	mg/L				0.0006	0.0000	0.0003	0.0001	0.0003				
Zinc Zn	mg/L				0.0014	0.0032	0.0033	0.0017	0.0023				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-2-A-2
Scenario 2

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16
Parameter												
TDS	mg/L				161	121	146	145	145			
TSS	mg/L				4.0	5.9	5.9	7.0	7.0			
Free CN	mg/L											
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002			
WAD CN	mg/L											
CNO	mg/L											
SCN	mg/L				0.002		0.002					
Sulphate	mg/L				4.7	2.7	4.7	3.0	3.0			
Chloride	mg/L				76	61	73	63	63			
Total Ammonia	mg/L				0.005	0.008	0.013	0.013	0.013			
Nitrate	mg/L				0.08	0.01	0.08	0.01	0.01			
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002			
Alkalinity	mg/L				28	25	28	27	27			
OrthoPhosphate-P	mg/L				0.0047	0.0008	0.0045	0.0008	0.0008			
Phosphate-P	mg/L				0.0200	0.0179	0.0271	0.0195	0.0195			
Org. Carbon	mg/L				5.5	5.1	7.4	5.0	5.0			
Hardness CaCO3	mg/L				47	43	44	44	44			
Total Metals												
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07			
Antimony Sb	mg/L				0.0007	0.0008	0.0031	0.0005	0.0005			
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004			
Barium Ba	mg/L				0.0030	0.0032	0.0031	0.0031	0.0031			
Beryllium Be	mg/L				0.00002	0.00000	0.00002	0.00000	0.00000			
Bismuth Bi	mg/L				0.00038	0.00003	0.00036	0.00003	0.00003			
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022			
Cadmium Cd	mg/L				0.0000039	0.0000025	0.0000033	0.0000020	0.0000020			
Calcium Ca	mg/L				14	8	13	7	7			
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000			
Cobalt Co	mg/L				0.0003	0.0001	0.0011	0.0001	0.0001			
Copper Cu	mg/L				0.0014	0.0015	0.0014	0.0015	0.0015			
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09			
Lead Pb	mg/L				0.00003	0.00006	0.00005	0.00004	0.00004			
Lithium Li	mg/L				0.0029	0.0028	0.0029	0.0028	0.0028			
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5			
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010			
Mercury Hg	mg/L				0.0000008	0.0000006	0.0000008	0.0000006	0.0000006			
Molybdenum Mo	mg/L				0.00034	0.00015	0.00035	0.00016	0.00016			
Nickel Ni	mg/L				0.0006	0.0006	0.0006	0.0004	0.0004			
Phosphorus P	mg/L				0.022	0.018	0.029	0.020	0.020			
Potassium K	mg/L				3.6	2.4	3.2	2.3	2.3			
Selenium Se	mg/L				0.00088	0.00057	0.00062	0.00056	0.00056			
Silicon SiO2	mg/L				0.59	0.50	0.58	0.50	0.50			
Silver Ag	mg/L				0.0000055	0.0000010	0.0000053	0.0000007	0.0000007			
Sodium Na	mg/L				43	33	38	32	32			
Strontium Sr	mg/L				0.041	0.042	0.037	0.040	0.040			
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050			
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030			
Thorium Th	mg/L				0.000001		0.000001					
Tin Sn	mg/L				0.00044	0.00040	0.00044	0.00040	0.00040			
Titanium Ti	mg/L				0.0060	0.0060	0.0061	0.0060	0.0060			
Uranium U	mg/L				0.000026	0.000030	0.000039	0.000031	0.000031			
Vanadium V	mg/L				0.0006	0.0000	0.0003	0.0001	0.0001			
Zinc Zn	mg/L				0.0014	0.0032	0.0032	0.0017	0.0017			
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050			

Table H 2-A-3
Scenario 2**Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter												
TDS				1007213	541020	235008	348940	121765				
TSS				28778	26214	11280	16845	5878				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN												
Sulphate				20357	12213	5395	7242	2527				
Chloride				435260	269952	109984	150405	52485				
Total Ammonia				60	50	33	39	14				
Nitrate				231	143	60	77	27				
Nitrite				19	12	5	6	2				
Alkalinity				197845	113224	50762	63772	22254				
OrthoPhosphate-P				5	3	1	2	1				
Phosphate-P				119	80	45	47	16				
Org. Carbon				39569	22868	14100	12032	4199				
Hardness CaCO3				327344	190751	79903	105885	36950				
Total Metals												
Aluminum Al				244	270	153	175	61				
Antimony Sb				2.6	3.7	5.4	1.1	0.4				
Arsenic As				3.5	1.8	0.7	0.9	0.3				
Barium Ba				21	14	6	7	3				
Beryllium Be				0.06	0.03	0.01	0.02	0.01				
Bismuth Bi				0.24	0.15	0.06	0.08	0.03				
Boron B				249	101	44	54	19				
Cadmium Cd				0.02	0.01	0.01	0.01	0.00				
Calcium Ca				61239	35036	14368	17701	6177				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.36	0.62	1.67	0.19	0.07				
Copper Cu				9	7	2	4	1				
Iron Fe				368	558	160	218	76				
Lead Pb				0.15	0.29	0.08	0.09	0.03				
Lithium Li				20	13	5	7	2				
Magnesium Mg				52549	29290	12454	15596	5442				
Manganese Mn				48	93	25	24	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.13	0.68	0.34	0.39	0.13				
Nickel Ni				2.93	2.55	0.87	1.05	0.37				
Phosphorus P				122	82	46	48	17				
Potassium K				20296	10803	4524	5634	1966				
Selenium Se				6.48	2.56	1.17	1.35	0.47				
Silicon SiO2				3654	2266	955	1222	427				
Silver Ag				0.01	0.01	0.00	0.00	0.00				
Sodium Na				282747	147697	64676	77331	26985				
Strontium Sr				292	188	67	96	34				
Tellurium Te				360	223	94	120	42				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				2.90	1.80	0.76	0.97	0.34				
Titanium Ti				43	27	11	14	5				
Uranium U				0.19	0.14	0.07	0.08	0.03				
Vanadium V				4.01	0.23	0.45	0.35	0.12				
Zinc Zn				6.60	14.17	5.37	4.12	1.44				
Zirconium Zr				36	22	9	12	4				

Table H 2-A-3
Scenario 2

Solute Loadings in DSolute Loadings in DORIS CREEK D/S of waterfall (kg/month)

Date	Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter												
TDS				1007213	541020	235008	348940	121765				
TSS				28778	26214	11280	16845	5878				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN												
Sulphate				20357	12213	5395	7242	2527				
Chloride				435260	269952	109984	150405	52485				
Total Ammonia				60	50	33	39	14				
Nitrate				231	143	60	77	27				
Nitrite				19	12	5	6	2				
Alkalinity				197845	113224	50762	63772	22254				
OrthoPhosphate-P				5	3	1	2	1				
Phosphate-P				119	80	45	47	16				
Org. Carbon				39569	22868	14100	12032	4199				
Hardness CaCO3				327344	190751	79903	105885	36950				
Total Metals												
Aluminum Al				244	270	153	175	61				
Antimony Sb				2.6	3.7	5.4	1.1	0.4				
Arsenic As				3.5	1.8	0.7	0.9	0.3				
Barium Ba				21	14	6	7	3				
Beryllium Be				0.06	0.03	0.01	0.02	0.01				
Bismuth Bi				0.24	0.15	0.06	0.08	0.03				
Boron B				249	101	44	54	19				
Cadmium Cd				0.02	0.01	0.01	0.01	0.00				
Calcium Ca				61239	35036	14368	17701	6177				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.36	0.62	1.67	0.19	0.07				
Copper Cu				9	7	2	4	1				
Iron Fe				368	558	160	218	76				
Lead Pb				0.15	0.29	0.08	0.09	0.03				
Lithium Li				20	13	5	7	2				
Magnesium Mg				52549	29290	12454	15596	5442				
Manganese Mn				48	93	25	24	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.13	0.68	0.34	0.39	0.13				
Nickel Ni				2.93	2.55	0.87	1.05	0.37				
Phosphorus P				122	82	46	48	17				
Potassium K				20296	10803	4524	5634	1966				
Selenium Se				6.48	2.56	1.17	1.35	0.47				
Silicon SiO2				3654	2266	955	1222	427				
Silver Ag				0.01	0.01	0.00	0.00	0.00				
Sodium Na				282747	147697	64676	77331	26985				
Strontium Sr				292	188	67	96	34				
Tellurium Te				360	223	94	120	42				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				2.90	1.80	0.76	0.97	0.34				
Titanium Ti				43	27	11	14	5				
Uranium U				0.19	0.14	0.07	0.08	0.03				
Vanadium V				4.01	0.23	0.45	0.35	0.12				
Zinc Zn				6.60	14.17	5.37	4.12	1.44				
Zirconium Zr				36	22	9	12	4				

Table H 2-A-3
Scenario 2**Solute Loadings in D**
Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)

Date	Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter												
TDS				1007213	541020	235008	348940	121765				
TSS				28778	26214	11280	16845	5878				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN												
Sulphate				20357	12213	5395	7242	2527				
Chloride				435260	269952	109984	150405	52485				
Total Ammonia				60	50	33	39	14				
Nitrate				231	143	60	77	27				
Nitrite				19	12	5	6	2				
Alkalinity				197845	113224	50762	63772	22254				
OrthoPhosphate-P				5	3	1	2	1				
Phosphate-P				119	80	45	47	16				
Org. Carbon				39569	22868	14100	12032	4199				
Hardness CaCO3				327344	190751	79903	105885	36950				
Total Metals												
Aluminum Al				244	270	153	175	61				
Antimony Sb				2.6	3.7	5.4	1.1	0.4				
Arsenic As				3.5	1.8	0.7	0.9	0.3				
Barium Ba				21	14	6	7	3				
Beryllium Be				0.06	0.03	0.01	0.02	0.01				
Bismuth Bi				0.24	0.15	0.06	0.08	0.03				
Boron B				249	101	44	54	19				
Cadmium Cd				0.02	0.01	0.01	0.01	0.00				
Calcium Ca				61239	35036	14368	17701	6177				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.36	0.62	1.67	0.19	0.07				
Copper Cu				9	7	2	4	1				
Iron Fe				368	558	160	218	76				
Lead Pb				0.15	0.29	0.08	0.09	0.03				
Lithium Li				20	13	5	7	2				
Magnesium Mg				52549	29290	12454	15596	5442				
Manganese Mn				48	93	25	24	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.13	0.68	0.34	0.39	0.13				
Nickel Ni				2.93	2.55	0.87	1.05	0.37				
Phosphorus P				122	82	46	48	17				
Potassium K				20296	10803	4524	5634	1966				
Selenium Se				6.48	2.56	1.17	1.35	0.47				
Silicon SiO2				3654	2266	955	1222	427				
Silver Ag				0.01	0.01	0.00	0.00	0.00				
Sodium Na				282747	147697	64676	77331	26985				
Strontium Sr				292	188	67	96	34				
Tellurium Te				360	223	94	120	42				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				2.90	1.80	0.76	0.97	0.34				
Titanium Ti				43	27	11	14	5				
Uranium U				0.19	0.14	0.07	0.08	0.03				
Vanadium V				4.01	0.23	0.45	0.35	0.12				
Zinc Zn				6.60	14.17	5.37	4.12	1.44				
Zirconium Zr				36	22	9	12	4				

Table H 2-A-3
Scenario 2**Solute Loadings in D**Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)

Date	Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter												
TDS				1007213	541020	235008	348940	121765				
TSS				28778	26214	11280	16845	5878				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN												
Sulphate				20357	12213	5395	7242	2527				
Chloride				435260	269952	109984	150405	52485				
Total Ammonia				60	50	33	39	14				
Nitrate				231	143	60	77	27				
Nitrite				19	12	5	6	2				
Alkalinity				197845	113224	50762	63772	22254				
OrthoPhosphate-P				5	3	1	2	1				
Phosphate-P				119	80	45	47	16				
Org. Carbon				39569	22868	14100	12032	4199				
Hardness CaCO3				327344	190751	79903	105885	36950				
Total Metals												
Aluminum Al				244	270	153	175	61				
Antimony Sb				2.6	3.7	5.4	1.1	0.4				
Arsenic As				3.5	1.8	0.7	0.9	0.3				
Barium Ba				21	14	6	7	3				
Beryllium Be				0.06	0.03	0.01	0.02	0.01				
Bismuth Bi				0.24	0.15	0.06	0.08	0.03				
Boron B				249	101	44	54	19				
Cadmium Cd				0.02	0.01	0.01	0.01	0.00				
Calcium Ca				61239	35036	14368	17701	6177				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.36	0.62	1.67	0.19	0.07				
Copper Cu				9	7	2	4	1				
Iron Fe				368	558	160	218	76				
Lead Pb				0.15	0.29	0.08	0.09	0.03				
Lithium Li				20	13	5	7	2				
Magnesium Mg				52549	29290	12454	15596	5442				
Manganese Mn				48	93	25	24	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.13	0.68	0.34	0.39	0.13				
Nickel Ni				2.93	2.55	0.87	1.05	0.37				
Phosphorus P				122	82	46	48	17				
Potassium K				20296	10803	4524	5634	1966				
Selenium Se				6.48	2.56	1.17	1.35	0.47				
Silicon SiO2				3654	2266	955	1222	427				
Silver Ag				0.01	0.01	0.00	0.00	0.00				
Sodium Na				282747	147697	64676	77331	26985				
Strontium Sr				292	188	67	96	34				
Tellurium Te				360	223	94	120	42				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				2.90	1.80	0.76	0.97	0.34				
Titanium Ti				43	27	11	14	5				
Uranium U				0.19	0.14	0.07	0.08	0.03				
Vanadium V				4.01	0.23	0.45	0.35	0.12				
Zinc Zn				6.60	14.17	5.37	4.12	1.44				
Zirconium Zr				36	22	9	12	4				

Table H 2-A-3
Scenario 2**Solute Loadings in D**
Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)

Date	Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter												
TDS				1007213	541020	235008	348940	121765				
TSS				28778	26214	11280	16845	5878				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN												
Sulphate				20357	12213	5395	7242	2527				
Chloride				435260	269952	109984	150405	52485				
Total Ammonia				60	50	33	39	14				
Nitrate				231	143	60	77	27				
Nitrite				19	12	5	6	2				
Alkalinity				197845	113224	50762	63772	22254				
OrthoPhosphate-P				5	3	1	2	1				
Phosphate-P				119	80	45	47	16				
Org. Carbon				39569	22868	14100	12032	4199				
Hardness CaCO3				327344	190751	79903	105885	36950				
Total Metals												
Aluminum Al				244	270	153	175	61				
Antimony Sb				2.6	3.7	5.4	1.1	0.4				
Arsenic As				3.5	1.8	0.7	0.9	0.3				
Barium Ba				21	14	6	7	3				
Beryllium Be				0.06	0.03	0.01	0.02	0.01				
Bismuth Bi				0.24	0.15	0.06	0.08	0.03				
Boron B				249	101	44	54	19				
Cadmium Cd				0.02	0.01	0.01	0.01	0.00				
Calcium Ca				61239	35036	14368	17701	6177				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.36	0.62	1.67	0.19	0.07				
Copper Cu				9	7	2	4	1				
Iron Fe				368	558	160	218	76				
Lead Pb				0.15	0.29	0.08	0.09	0.03				
Lithium Li				20	13	5	7	2				
Magnesium Mg				52549	29290	12454	15596	5442				
Manganese Mn				48	93	25	24	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.13	0.68	0.34	0.39	0.13				
Nickel Ni				2.93	2.55	0.87	1.05	0.37				
Phosphorus P				122	82	46	48	17				
Potassium K				20296	10803	4524	5634	1966				
Selenium Se				6.48	2.56	1.17	1.35	0.47				
Silicon SiO2				3654	2266	955	1222	427				
Silver Ag				0.01	0.01	0.00	0.00	0.00				
Sodium Na				282747	147697	64676	77331	26985				
Strontium Sr				292	188	67	96	34				
Tellurium Te				360	223	94	120	42				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				2.90	1.80	0.76	0.97	0.34				
Titanium Ti				43	27	11	14	5				
Uranium U				0.19	0.14	0.07	0.08	0.03				
Vanadium V				4.01	0.23	0.45	0.35	0.12				
Zinc Zn				6.60	14.17	5.37	4.12	1.44				
Zirconium Zr				36	22	9	12	4				

Table H 2-A-3
Scenario 2

Solute Loadings in DSolute Loadings in DORIS CREEK D/S of waterfall (kg/month)

Date	Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter												
TDS				1007213	541020	235008	348940	121765				
TSS				28778	26214	11280	16845	5878				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN												
Sulphate				20180	12103	5349	7183	2507				
Chloride				435260	269952	109984	150405	52485				
Total Ammonia				36	36	26	31	11				
Nitrate				43	27	11	14	5				
Nitrite				14	9	4	5	2				
Alkalinity				197845	113224	50762	63772	22254				
OrthoPhosphate-P				5	3	1	2	1				
Phosphate-P				119	80	45	47	16				
Org. Carbon				39569	22868	14100	12032	4199				
Hardness CaCO3				327344	190751	79903	105885	36950				
Total Metals												
Aluminum Al				239	266	152	174	61				
Antimony Sb				2.6	3.7	5.3	1.1	0.4				
Arsenic As				3.4	1.8	0.7	0.9	0.3				
Barium Ba				21	14	6	7	3				
Beryllium Be				0.04	0.01	0.01	0.01	0.00				
Bismuth Bi				0.22	0.13	0.06	0.07	0.03				
Boron B				247	100	44	54	19				
Cadmium Cd				0.02	0.01	0.00	0.00	0.00				
Calcium Ca				60936	34848	14288	17599	6141				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.33	0.60	1.67	0.18	0.06				
Copper Cu				9	7	2	4	1				
Iron Fe				367	558	159	217	76				
Lead Pb				0.13	0.27	0.07	0.09	0.03				
Lithium Li				20	12	5	7	2				
Magnesium Mg				52519	29271	12446	15586	5439				
Manganese Mn				47	93	25	24	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.13	0.68	0.34	0.39	0.13				
Nickel Ni				2.91	2.53	0.87	1.04	0.36				
Phosphorus P				119	80	45	47	16				
Potassium K				20288	10798	4522	5631	1965				
Selenium Se				6.46	2.55	1.16	1.34	0.47				
Silicon SiO2				3597	2231	940	1203	420				
Silver Ag				0.01	0.00	0.00	0.00	0.00				
Sodium Na				282739	147693	64674	77328	26984				
Strontium Sr				292	187	67	96	34				
Tellurium Te				360	223	94	120	42				
Thallium Tl				0.22	0.13	0.06	0.07	0.03				
Thorium Th												
Tin Sn				2.88	1.78	0.75	0.96	0.34				
Titanium Ti				43	27	11	14	5				
Uranium U				0.18	0.13	0.07	0.08	0.03				
Vanadium V				3.96	0.20	0.44	0.33	0.12				
Zinc Zn				6.47	14.10	5.34	4.08	1.42				
Zirconium Zr				36	22	9	12	4				

Table H 2-A-3
Scenario 2

Solute Loadings in DSolute Loadings in DORIS CREEK D/S of waterfall (kg/month)

Date	Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter												
TDS				1007213	541020	235008	348940	121765				
TSS				28778	26214	11280	16845	5878				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN												
Sulphate				20180	12103	5349	7183	2507				
Chloride				435260	269952	109984	150405	52485				
Total Ammonia				36	36	26	31	11				
Nitrate				43	27	11	14	5				
Nitrite				14	9	4	5	2				
Alkalinity				197845	113224	50762	63772	22254				
OrthoPhosphate-P				5	3	1	2	1				
Phosphate-P				119	80	45	47	16				
Org. Carbon				39569	22868	14100	12032	4199				
Hardness CaCO3				327344	190751	79903	105885	36950				
Total Metals												
Aluminum Al				239	266	152	174	61				
Antimony Sb				2.6	3.7	5.3	1.1	0.4				
Arsenic As				3.4	1.8	0.7	0.9	0.3				
Barium Ba				21	14	6	7	3				
Beryllium Be				0.04	0.01	0.01	0.01	0.00				
Bismuth Bi				0.22	0.13	0.06	0.07	0.03				
Boron B				247	100	44	54	19				
Cadmium Cd				0.02	0.01	0.00	0.00	0.00				
Calcium Ca				60936	34848	14288	17599	6141				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.33	0.60	1.67	0.18	0.06				
Copper Cu				9	7	2	4	1				
Iron Fe				367	558	159	217	76				
Lead Pb				0.13	0.27	0.07	0.09	0.03				
Lithium Li				20	12	5	7	2				
Magnesium Mg				52519	29271	12446	15586	5439				
Manganese Mn				47	93	25	24	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.13	0.68	0.34	0.39	0.13				
Nickel Ni				2.91	2.53	0.87	1.04	0.36				
Phosphorus P				119	80	45	47	16				
Potassium K				20288	10798	4522	5631	1965				
Selenium Se				6.46	2.55	1.16	1.34	0.47				
Silicon SiO2				3597	2231	940	1203	420				
Silver Ag				0.01	0.00	0.00	0.00	0.00				
Sodium Na				282739	147693	64674	77328	26984				
Strontium Sr				292	187	67	96	34				
Tellurium Te				360	223	94	120	42				
Thallium Tl				0.22	0.13	0.06	0.07	0.03				
Thorium Th												
Tin Sn				2.88	1.78	0.75	0.96	0.34				
Titanium Ti				43	27	11	14	5				
Uranium U				0.18	0.13	0.07	0.08	0.03				
Vanadium V				3.96	0.20	0.44	0.33	0.12				
Zinc Zn				6.47	14.10	5.34	4.08	1.42				
Zirconium Zr				36	22	9	12	4				

Table H 2-A-3
Scenario 2**Solute Loadings in D**
Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)

Date	Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter												
TDS				1007213	625406	235008	348940	121765				
TSS				28778	26737	11280	16845	5878				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN					9							
Sulphate				20180	21407	5349	7183	2507				
Chloride				435260	326034	109984	150405	52485				
Total Ammonia				36	36	26	31	11				
Nitrate				43	485	11	14	5				
Nitrite				14	9	4	5	2				
Alkalinity				197845	120651	50762	63772	22254				
OrthoPhosphate-P				5	22	1	2	1				
Phosphate-P				119	99	45	47	16				
Org. Carbon				39569	23694	14100	12032	4199				
Hardness CaCO3				327344	203950	79903	105885	36950				
Total Metals												
Aluminum Al				239	275	152	174	61				
Antimony Sb				2.6	5.4	5.3	1.1	0.4				
Arsenic As				3.4	2.1	0.7	0.9	0.3				
Barium Ba				21	15	6	7	3				
Beryllium Be				0.04	0.09	0.01	0.01	0.00				
Bismuth Bi				0.22	1.73	0.06	0.07	0.03				
Boron B				247	105	44	54	19				
Cadmium Cd				0.02	0.02	0.00	0.00	0.00				
Calcium Ca				60936	59063	14288	17599	6141				
Chromium Cr				5	2	1	1	0				
Cobalt Co				0.33	1.60	1.67	0.18	0.06				
Copper Cu				9	8	2	4	1				
Iron Fe				367	568	159	217	76				
Lead Pb				0.13	0.32	0.07	0.09	0.03				
Lithium Li				20	13	5	7	2				
Magnesium Mg				52519	30575	12446	15586	5439				
Manganese Mn				47	96	25	24	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.13	1.53	0.34	0.39	0.13				
Nickel Ni				2.91	3.41	0.87	1.04	0.36				
Phosphorus P				119	108	45	47	16				
Potassium K				20288	14792	4522	5631	1965				
Selenium Se				6.46	2.63	1.16	1.34	0.47				
Silicon SiO2				3597	2693	940	1203	420				
Silver Ag				0.01	0.02	0.00	0.00	0.00				
Sodium Na				282739	156815	64674	77328	26984				
Strontium Sr				292	198	67	96	34				
Tellurium Te				360	230	94	120	42				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th					0.00							
Tin Sn				2.88	2.05	0.75	0.96	0.34				
Titanium Ti				43	28	11	14	5				
Uranium U				0.18	0.14	0.07	0.08	0.03				
Vanadium V				3.96	0.62	0.44	0.33	0.12				
Zinc Zn				6.47	16.48	5.34	4.08	1.42				
Zirconium Zr				36	23	9	12	4				

Table H 2-A-3
Scenario 2**Solute Loadings in D**
Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)

Date	Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter												
TDS				1223495	541020	289157	348940	153315				
TSS				29753	26214	11547	16845	6037				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				16		4		2				
Sulphate				36552	12103	9414	7183	4871				
Chloride				575431	269952	145128	150405	72972				
Total Ammonia				36	36	26	31	11				
Nitrate				757	27	188	14	108				
Nitrite				14	9	4	5	2				
Alkalinity				211226	113224	54216	63772	24279				
OrthoPhosphate-P				38	3	9	2	5				
Phosphate-P				152	80	54	47	21				
Org. Carbon				41093	22868	14511	12032	4441				
Hardness CaCO3				351000	190751	85950	105885	40490				
Total Metals												
Aluminum Al				256	266	157	174	64				
Antimony Sb				5.5	3.7	6.1	1.1	0.8				
Arsenic As				3.9	1.8	0.8	0.9	0.4				
Barium Ba				23	14	6	7	3				
Beryllium Be				0.18	0.01	0.04	0.01	0.02				
Bismuth Bi				3.03	0.13	0.75	0.07	0.43				
Boron B				256	100	46	54	20				
Cadmium Cd				0.03	0.01	0.01	0.00	0.00				
Calcium Ca				107487	34848	25852	17599	12868				
Chromium Cr				6	1	1	1	0				
Cobalt Co				2.09	0.60	2.11	0.18	0.32				
Copper Cu				10	7	3	4	2				
Iron Fe				388	558	165	217	80				
Lead Pb				0.22	0.27	0.09	0.09	0.04				
Lithium Li				22	12	6	7	3				
Magnesium Mg				54890	29271	13067	15586	5804				
Manganese Mn				53	93	26	24	9				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				2.62	0.68	0.71	0.39	0.35				
Nickel Ni				4.45	2.53	1.25	1.04	0.59				
Phosphorus P				169	80	58	47	24				
Potassium K				27343	10798	6286	5631	2993				
Selenium Se				6.62	2.55	1.21	1.34	0.49				
Silicon SiO2				4424	2231	1152	1203	544				
Silver Ag				0.04	0.00	0.01	0.00	0.01				
Sodium Na				321471	147693	74510	77328	32734				
Strontium Sr				311	187	72	96	36				
Tellurium Te				372	223	97	120	44				
Thallium Tl				0.23	0.13	0.06	0.07	0.03				
Thorium Th				0.01		0.00		0.00				
Tin Sn				3.35	1.78	0.87	0.96	0.41				
Titanium Ti				45	27	12	14	5				
Uranium U				0.20	0.13	0.08	0.08	0.03				
Vanadium V				4.72	0.20	0.64	0.33	0.23				
Zinc Zn				10.70	14.10	6.40	4.08	2.04				
Zirconium Zr				37	22	10	12	4				

Table H 2-A-3
Scenario 2**Solute Loadings in D**Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)

Date	Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16	Year 10 Jan-17
Parameter												
TDS				1213529	541020	286666	348940	121765				
TSS				29817	26214	11563	16845	5878				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				15		4						
Sulphate				35639	12103	9186	7183	2507				
Chloride				569235	269952	143579	150405	52485				
Total Ammonia				36	36	26	31	11				
Nitrate				623	27	155	14	5				
Nitrite				14	9	4	5	2				
Alkalinity				211103	113224	54184	63772	22254				
OrthoPhosphate-P				36	3	9	2	1				
Phosphate-P				151	80	53	47	16				
Org. Carbon				41157	22868	14527	12032	4199				
Hardness CaCO3				350516	190751	85828	105885	36950				
Total Metals												
Aluminum Al				259	266	158	174	61				
Antimony Sb				5.4	3.7	6.0	1.1	0.4				
Arsenic As				3.9	1.8	0.8	0.9	0.3				
Barium Ba				23	14	6	7	3				
Beryllium Be				0.18	0.01	0.04	0.01	0.00				
Bismuth Bi				2.86	0.13	0.71	0.07	0.03				
Boron B				256	100	46	54	19				
Cadmium Cd				0.03	0.01	0.01	0.00	0.00				
Calcium Ca				104913	34848	25209	17599	6141				
Chromium Cr				6	1	1	1	0				
Cobalt Co				1.99	0.60	2.08	0.18	0.06				
Copper Cu				10	7	3	4	1				
Iron Fe				391	558	166	217	76				
Lead Pb				0.21	0.27	0.09	0.09	0.03				
Lithium Li				22	12	6	7	2				
Magnesium Mg				54913	29271	13072	15586	5439				
Manganese Mn				52	93	26	24	9				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				2.54	0.68	0.69	0.39	0.13				
Nickel Ni				4.37	2.53	1.23	1.04	0.36				
Phosphorus P				166	80	57	47	16				
Potassium K				27009	10798	6202	5631	1965				
Selenium Se				6.64	2.55	1.21	1.34	0.47				
Silicon SiO2				4408	2231	1147	1203	420				
Silver Ag				0.04	0.00	0.01	0.00	0.00				
Sodium Na				320357	147693	74230	77328	26984				
Strontium Sr				311	187	72	96	34				
Tellurium Te				373	223	97	120	42				
Thallium Tl				0.23	0.13	0.06	0.07	0.03				
Thorium Th				0.01		0.00						
Tin Sn				3.33	1.78	0.86	0.96	0.34				
Titanium Ti				45	27	12	14	5				
Uranium U				0.20	0.13	0.08	0.08	0.03				
Vanadium V				4.72	0.20	0.64	0.33	0.12				
Zinc Zn				10.52	14.10	6.35	4.08	1.42				
Zirconium Zr				37	22	10	12	4				

Table H-2-A-1
Scenario 2

OUTPUT SUMMARY							Fraction of CCME in Doris Creek (%)
Discharge rate Degradation Field(age)		m3/year Tail Lk Cu < CME Year					
		MMER	CCME	Tail Lake Year 2	Doris Creek Year 9	L'Roberts L Year 9	
Maximum Concentration							
pH			6 to 9	7 to 8	7 to 8	7 to 8	
TDS	mg/L			652	172	178	
TSS	mg/L			4.8	7.0	8.1	
Free CN	mg/L		0.005	0.0025			
Total CN	mg/L	1.0		0.025	0.002	0.002	
WAD CN	mg/L			0.0034			
CNO	mg/L			2.8			
SCN	mg/L			0.090	0.003	0.001	
Sulphate	mg/L			83	5.5	5.8	
Chloride	mg/L			422	82	77	
Total Ammonia	mg/L		0.97	1.01	0.017	0.009	2%
Nitrate	mg/L		2.9	5.2	0.12	0.07	4%
Nitrite	mg/L		0.018	0.39	0.003	0.002	14%
Alkalinity	mg/L			52	28	26	
OrthoPhosphate-P	mg/L			0.1504	0.0059	0.0037	
Phosphate-P	mg/L			0.1537	0.0273	0.0263	
Org. Carbon	mg/L			6.4	7.5	7.1	
Hardness CaCO3	mg/L			100	47	46	
Total Metals							
Aluminum Al	mg/L		0.1	0.15	0.08	0.25	84%
Antimony Sb	mg/L			0.0138	0.0031	0.0019	
Arsenic As	mg/L	0.5	0.005	0.00	0.0005	0.0005	10%
Barium Ba	mg/L			0.0097	0.0033	0.0052	
Beryllium Be	mg/L			0.00056	0.00003	0.00002	
Bismuth Bi	mg/L			0.01323	0.00048	0.00034	
Boron B	mg/L			0.035	0.035	0.030	
Cadmium Cd	mg/L		0.000038	0.000051	0.0000039	0.0000153	10%
Calcium Ca	mg/L			225	14	11	
Chromium Cr	mg/L		0.001	0.0060	0.001	0.001	77%
Cobalt Co	mg/L			0.0094	0.0011	0.0005	
Copper Cu	mg/L	0.3	0.002	0.009	0.0017	0.0020	85%
Iron Fe	mg/L		0.3	0.17	0.13	0.28	42%
Lead Pb	mg/L	0.2	0.002	0.00038	0.00007	0.00026	3%
Lithium Li	mg/L			0.0054	0.0029	0.0029	
Magnesium Mg	mg/L			8.8	7.3	7.3	
Manganese Mn	mg/L			0.026	0.021	0.024	
Mercury Hg	mg/L		0.0001	0.0000116	0.0000012	0.0000009	1%
Molybdenum Mo	mg/L		0.073	0.0081	0.00039	0.00033	1%
Nickel Ni	mg/L	0.5	0.025	0.008	0.0007	0.0007	3%
Phosphorus P	mg/L			0.227	0.029	0.027	
Potassium K	mg/L			37	3.6	3.2	
Selenium Se	mg/L		0.001	0.00096	0.00090	0.00084	90%
Silicon SiO2	mg/L			3.6	0.61	0.57	
Silver Ag	mg/L		0.0001	0.00011	0.0000068	0.0000056	7%
Sodium Na	mg/L			117	43	40	
Strontium Sr	mg/L			0.081	0.043	0.047	
Tellurium Te	mg/L			0.052	0.050	0.052	
Thallium Tl	mg/L		0.0008	0.000041	0.000031	0.002001	4%
Thorium Th	mg/L			0.000044	0.0000025	0.0000013	
Tin Sn	mg/L			0.00209	0.00046	0.00004	
Titanium Ti	mg/L			0.0133	0.0064	0.0064	
Uranium U	mg/L			0.000077	0.000039	0.000044	
Vanadium V	mg/L			0.0031	0.0006	0.0005	
Zinc Zn	mg/L	0.5	0.03	0.021	0.0036	0.0055	12%
Zirconium Zr	mg/L			0.0055	0.0050	0.0052	

Table H-2-A-2
Scenario 2

Water Quality in Little Roberst Lake Outflow

Date		Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter													
TDS	mg/L				150	150	140	160	160				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				3.8	3.7	4.7	4.5	4.5				
Chloride	mg/L				61	58	57	65	65				
Total Ammonia	mg/L				0.007	0.007	0.002	0.009	0.009				
Nitrate	mg/L				0.02	0.02	0.01	0.02	0.02				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0010	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0160	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00000	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00010	0.00010	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000028	0.0000044	0.0000149	0.0000024	0.0000024				
Calcium Ca	mg/L				8	7	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00016	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0005	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.2	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000038	0.0000010	0.0000034	0.0000018	0.0000018				
Sodium Na	mg/L				37	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00000	0.00000	0.00000	0.00000	0.00000				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-2-A-2
Scenario 2

Water Quality in Little Roberst Lake Outflow

Date		Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter													
TDS	mg/L				150	150	140	160	160				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				3.8	3.7	4.7	4.5	4.5				
Chloride	mg/L				61	58	57	65	65				
Total Ammonia	mg/L				0.007	0.007	0.002	0.009	0.009				
Nitrate	mg/L				0.02	0.02	0.01	0.02	0.02				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0010	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0160	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00000	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00010	0.00010	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000028	0.0000044	0.0000149	0.0000024	0.0000024				
Calcium Ca	mg/L				8	7	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00016	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0005	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.2	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000038	0.0000010	0.0000034	0.0000018	0.0000018				
Sodium Na	mg/L				37	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00000	0.00000	0.00000	0.00000	0.00000				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-2-A-2
Scenario 2

Water Quality in Little Roberst Lake Outflow

Date		Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter													
TDS	mg/L				150	150	140	160	160				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				3.8	3.7	4.7	4.5	4.5				
Chloride	mg/L				61	58	57	65	65				
Total Ammonia	mg/L				0.007	0.007	0.002	0.009	0.009				
Nitrate	mg/L				0.02	0.02	0.01	0.02	0.02				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0010	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0160	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00000	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00010	0.00010	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000028	0.0000044	0.0000149	0.0000024	0.0000024				
Calcium Ca	mg/L				8	7	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00016	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0005	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.2	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000038	0.0000010	0.0000034	0.0000018	0.0000018				
Sodium Na	mg/L				37	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00000	0.00000	0.00000	0.00000	0.00000				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-2-A-2
Scenario 2

Water Quality in Little Roberst Lake Outflow

Date		Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter													
TDS	mg/L				150	150	140	160	160				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				3.8	3.7	4.7	4.5	4.5				
Chloride	mg/L				61	58	57	65	65				
Total Ammonia	mg/L				0.007	0.007	0.002	0.009	0.009				
Nitrate	mg/L				0.02	0.02	0.01	0.02	0.02				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0010	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0160	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00000	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00010	0.00010	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000028	0.0000044	0.0000149	0.0000024	0.0000024				
Calcium Ca	mg/L				8	7	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00016	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0005	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.2	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000038	0.0000010	0.0000034	0.0000018	0.0000018				
Sodium Na	mg/L				37	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00000	0.00000	0.00000	0.00000	0.00000				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-2-A-2
Scenario 2

Water Quality in Little Roberst Lake Outflow

Date		Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter													
TDS	mg/L				150	150	140	160	160				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				3.8	3.7	4.7	4.5	4.5				
Chloride	mg/L				61	58	57	65	65				
Total Ammonia	mg/L				0.007	0.007	0.002	0.009	0.009				
Nitrate	mg/L				0.02	0.02	0.01	0.02	0.02				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0010	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0160	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00000	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00010	0.00010	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000028	0.0000044	0.0000149	0.0000024	0.0000024				
Calcium Ca	mg/L				8	7	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00016	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0005	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.2	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000038	0.0000010	0.0000034	0.0000018	0.0000018				
Sodium Na	mg/L				37	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00000	0.00000	0.00000	0.00000	0.00000				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-2-A-2
Scenario 2

Water Quality in Little Roberst Lake Outflow

Date		Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter													
TDS	mg/L				150	150	140	160	160				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				3.8	3.7	4.7	4.4	4.4				
Chloride	mg/L				61	58	57	65	65				
Total Ammonia	mg/L				0.005	0.005		0.007	0.007				
Nitrate	mg/L				0.01	0.01		0.01	0.01				
Nitrite	mg/L				0.002	0.002		0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0010	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0160	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00000	0.00000	0.00000	0.00000				
Bismuth Bi	mg/L				0.00010	0.00010	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000024	0.0000040	0.0000145	0.0000020	0.0000020				
Calcium Ca	mg/L				8	7	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00016	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0005	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.2	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000032	0.0000005	0.0000029	0.0000013	0.0000013				
Sodium Na	mg/L				37	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L												
Tin Sn	mg/L												
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000035	0.000031	0.000034	0.000042	0.000042				
Vanadium V	mg/L				0.0004	0.0001	0.0004	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-2-A-2
Scenario 2

Water Quality in Little Roberst Lake Outflow

Date		Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter													
TDS	mg/L				150	150	140	160	160				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				3.8	3.7	4.7	4.4	4.4				
Chloride	mg/L				61	58	57	65	65				
Total Ammonia	mg/L				0.005	0.005		0.007	0.007				
Nitrate	mg/L				0.01	0.01		0.01	0.01				
Nitrite	mg/L				0.002	0.002		0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0010	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0160	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00000	0.00000	0.00000	0.00000				
Bismuth Bi	mg/L				0.00010	0.00010	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000024	0.0000040	0.0000145	0.0000020	0.0000020				
Calcium Ca	mg/L				8	7	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00016	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0005	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.2	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000032	0.0000005	0.0000029	0.0000013	0.0000013				
Sodium Na	mg/L				37	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L												
Tin Sn	mg/L												
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000035	0.000031	0.000034	0.000042	0.000042				
Vanadium V	mg/L				0.0004	0.0001	0.0004	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-2-A-2
Scenario 2

Water Quality in Little Roberst Lake Outflow

Date		Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter													
TDS	mg/L				150	159	140	160	160				
TSS	mg/L				7.0	8.1	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L					0.001							
Sulphate	mg/L				3.8	4.7	4.7	4.4	4.4				
Chloride	mg/L				61	64	57	65	65				
Total Ammonia	mg/L				0.005	0.005		0.007	0.007				
Nitrate	mg/L				0.01	0.06		0.01	0.01				
Nitrite	mg/L				0.002	0.002		0.002	0.002				
Alkalinity	mg/L				23	24	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0030	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0181	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.1	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	39	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0019	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0004	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0035	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00001	0.00000	0.00000	0.00000				
Bismuth Bi	mg/L				0.00010	0.00028	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000024	0.0000047	0.0000145	0.0000020	0.0000020				
Calcium Ca	mg/L				8	9	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0004	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0014	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0029	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.1	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.009	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000007	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00026	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0006	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.019	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.6	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.55	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000032	0.0000026	0.0000029	0.0000013	0.0000013				
Sodium Na	mg/L				37	32	34	36	36				
Strontium Sr	mg/L				0.044	0.038	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.051	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000301	0.000300	0.002000	0.002000				
Thorium Th	mg/L					0.000000							
Tin Sn	mg/L					0.00003							
Titanium Ti	mg/L				0.0060	0.0061	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000035	0.000032	0.000034	0.000042	0.000042				
Vanadium V	mg/L				0.0004	0.0001	0.0004	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0019	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0051	0.0050	0.0050	0.0050				

Table H-2-A-2
Scenario 2

Water Quality in Little Roberst Lake Outflow

Date		Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter													
TDS	mg/L				165	150	154	160	178				
TSS	mg/L				7.1	8.0	4.1	5.0	5.1				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.001		0.001		0.001				
Sulphate	mg/L				4.9	3.7	5.7	4.4	5.8				
Chloride	mg/L				71	58	66	65	77				
Total Ammonia	mg/L				0.005	0.005	0.000	0.007	0.007				
Nitrate	mg/L				0.05	0.01	0.05	0.01	0.07				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				24	23	25	25	26				
OrthoPhosphate-P	mg/L				0.0032	0.0010	0.0031	0.0010	0.0037				
Phosphate-P	mg/L				0.0263	0.0160	0.0092	0.0190	0.0219				
Org. Carbon	mg/L				6.1	4.0	7.1	5.0	5.1				
Hardness CaCO3	mg/L				45	38	42	44	46				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0006	0.0017	0.0014	0.0006	0.0009				
Arsenic As	mg/L				0.0005	0.0003	0.0005	0.0004	0.0005				
Barium Ba	mg/L				0.0052	0.0034	0.0045	0.0042	0.0043				
Beryllium Be	mg/L				0.00002	0.00000	0.00001	0.00000	0.00002				
Bismuth Bi	mg/L				0.00029	0.00010	0.00028	0.00010	0.00034				
Boron B	mg/L				0.030	0.020	0.029	0.026	0.027				
Cadmium Cd	mg/L				0.0000032	0.0000040	0.0000153	0.0000020	0.0000030				
Calcium Ca	mg/L				11	7	10	7	11				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0003	0.0003	0.0005	0.0001	0.0003				
Copper Cu	mg/L				0.0013	0.0013	0.0017	0.0018	0.0020				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00010	0.00025	0.00026				
Lithium Li	mg/L				0.0029	0.0028	0.0029	0.0028	0.0029				
Magnesium Mg	mg/L				7.1	5.0	5.3	7.1	7.3				
Manganese Mn	mg/L				0.024	0.008	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000007	0.0000006	0.0000007	0.0000006	0.0000008				
Molybdenum Mo	mg/L				0.00028	0.00016	0.00033	0.00020	0.00032				
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0007				
Phosphorus P	mg/L				0.027	0.016	0.010	0.019	0.023				
Potassium K	mg/L				3.2	2.2	2.6	2.5	3.1				
Selenium Se	mg/L				0.00065	0.00037	0.00083	0.00059	0.00061				
Silicon SiO2	mg/L				0.56	0.50	0.55	0.50	0.57				
Silver Ag	mg/L				0.0000056	0.0000005	0.0000053	0.0000013	0.0000044				
Sodium Na	mg/L				40	31	36	36	39				
Strontium Sr	mg/L				0.045	0.037	0.040	0.045	0.047				
Tellurium Te	mg/L				0.051	0.050	0.051	0.050	0.051				
Thallium Tl	mg/L				0.000101	0.000300	0.000301	0.002000	0.002001				
Thorium Th	mg/L				0.000001		0.000001		0.000001				
Tin Sn	mg/L				0.00003		0.00003		0.00004				
Titanium Ti	mg/L				0.0061	0.0060	0.0061	0.0060	0.0062				
Uranium U	mg/L				0.000036	0.000031	0.000035	0.000042	0.000044				
Vanadium V	mg/L				0.0005	0.0001	0.0005	0.0003	0.0004				
Zinc Zn	mg/L				0.0037	0.0017	0.0018	0.0051	0.0055				
Zirconium Zr	mg/L				0.0051	0.0050	0.0051	0.0050	0.0051				

Table H-2-A-2
Scenario 2

Water Quality in Little Roberst Lake Outflow

Date		Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16
Parameter												
TDS	mg/L				164	150	153	160	160			
TSS	mg/L				7.1	8.0	4.1	5.0	5.0			
Free CN	mg/L											
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002			
WAD CN	mg/L											
CNO	mg/L											
SCN	mg/L				0.001		0.001					
Sulphate	mg/L				4.8	3.7	5.7	4.4	4.4			
Chloride	mg/L				70	58	66	65	65			
Total Ammonia	mg/L				0.005	0.005	0.000	0.007	0.007			
Nitrate	mg/L				0.05	0.01	0.04	0.01	0.01			
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002			
Alkalinity	mg/L				24	23	25	25	25			
OrthoPhosphate-P	mg/L				0.0031	0.0010	0.0029	0.0010	0.0010			
Phosphate-P	mg/L				0.0262	0.0160	0.0091	0.0190	0.0190			
Org. Carbon	mg/L				6.1	4.0	7.1	5.0	5.0			
Hardness CaCO3	mg/L				45	38	42	44	44			
Total Metals												
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15			
Antimony Sb	mg/L				0.0006	0.0017	0.0013	0.0006	0.0006			
Arsenic As	mg/L				0.0005	0.0003	0.0005	0.0004	0.0004			
Barium Ba	mg/L				0.0052	0.0034	0.0045	0.0042	0.0042			
Beryllium Be	mg/L				0.00002	0.00000	0.00001	0.00000	0.00000			
Bismuth Bi	mg/L				0.00028	0.00010	0.00027	0.00010	0.00010			
Boron B	mg/L				0.030	0.020	0.029	0.026	0.026			
Cadmium Cd	mg/L				0.0000032	0.0000040	0.0000152	0.0000020	0.0000020			
Calcium Ca	mg/L				11	7	10	7	7			
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000			
Cobalt Co	mg/L				0.0003	0.0003	0.0005	0.0001	0.0001			
Copper Cu	mg/L				0.0013	0.0013	0.0017	0.0018	0.0018			
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16			
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025			
Lithium Li	mg/L				0.0029	0.0028	0.0029	0.0028	0.0028			
Magnesium Mg	mg/L				7.1	5.0	5.3	7.1	7.1			
Manganese Mn	mg/L				0.024	0.008	0.013	0.008	0.008			
Mercury Hg	mg/L				0.0000007	0.0000006	0.0000007	0.0000006	0.0000006			
Molybdenum Mo	mg/L				0.00028	0.00016	0.00033	0.00020	0.00020			
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006			
Phosphorus P	mg/L				0.027	0.016	0.010	0.019	0.019			
Potassium K	mg/L				3.1	2.2	2.6	2.5	2.5			
Selenium Se	mg/L				0.00065	0.00037	0.00083	0.00059	0.00059			
Silicon SiO2	mg/L				0.56	0.50	0.55	0.50	0.50			
Silver Ag	mg/L				0.0000056	0.0000005	0.0000053	0.0000013	0.0000013			
Sodium Na	mg/L				40	31	36	36	36			
Strontium Sr	mg/L				0.045	0.037	0.040	0.045	0.045			
Tellurium Te	mg/L				0.051	0.050	0.051	0.050	0.050			
Thallium Tl	mg/L				0.000101	0.000300	0.000301	0.002000	0.002000			
Thorium Th	mg/L				0.000001		0.000001					
Tin Sn	mg/L				0.00003		0.00003					
Titanium Ti	mg/L				0.0061	0.0060	0.0062	0.0060	0.0060			
Uranium U	mg/L				0.000036	0.000031	0.000035	0.000042	0.000042			
Vanadium V	mg/L				0.0005	0.0001	0.0005	0.0003	0.0003			
Zinc Zn	mg/L				0.0037	0.0017	0.0018	0.0051	0.0051			
Zirconium Zr	mg/L				0.0051	0.0050	0.0051	0.0050	0.0050			

Table H 2-A-3
Scenario 2

Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter												
TDS				140	121	125	145	145				
TSS				4.0	5.9	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN												
Sulphate				2.8	2.7	2.9	3.0	3.0				
Chloride				61	61	59	63	63				
Total Ammonia				0.008	0.011	0.017	0.016	0.016				
Nitrate				0.03	0.03	0.03	0.03	0.03				
Nitrite				0.003	0.003	0.003	0.003	0.003				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca				9	8	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.018	0.024	0.020	0.020				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.51	0.51	0.51	0.51	0.51				
Silver Ag				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000017	0.0000017	0.0000017	0.0000017	0.0000017				
Tin Sn				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 2-A-3
Scenario 2

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter												
TDS				140	121	125	145	145				
TSS				4.0	5.9	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN												
Sulphate				2.8	2.7	2.9	3.0	3.0				
Chloride				61	61	59	63	63				
Total Ammonia				0.008	0.011	0.017	0.016	0.016				
Nitrate				0.03	0.03	0.03	0.03	0.03				
Nitrite				0.003	0.003	0.003	0.003	0.003				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca				9	8	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.018	0.024	0.020	0.020				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.51	0.51	0.51	0.51	0.51				
Silver Ag				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000017	0.0000017	0.0000017	0.0000017	0.0000017				
Tin Sn				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 2-A-3
Scenario 2

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter												
TDS				140	121	125	145	145				
TSS				4.0	5.9	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN												
Sulphate				2.8	2.7	2.9	3.0	3.0				
Chloride				61	61	59	63	63				
Total Ammonia				0.008	0.011	0.017	0.016	0.016				
Nitrate				0.03	0.03	0.03	0.03	0.03				
Nitrite				0.003	0.003	0.003	0.003	0.003				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca				9	8	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.018	0.024	0.020	0.020				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.51	0.51	0.51	0.51	0.51				
Silver Ag				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000017	0.0000017	0.0000017	0.0000017	0.0000017				
Tin Sn				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 2-A-3
Scenario 2

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter												
TDS				140	121	125	145	145				
TSS				4.0	5.9	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN												
Sulphate				2.8	2.7	2.9	3.0	3.0				
Chloride				61	61	59	63	63				
Total Ammonia				0.008	0.011	0.017	0.016	0.016				
Nitrate				0.03	0.03	0.03	0.03	0.03				
Nitrite				0.003	0.003	0.003	0.003	0.003				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca				9	8	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.018	0.024	0.020	0.020				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.51	0.51	0.51	0.51	0.51				
Silver Ag				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000017	0.0000017	0.0000017	0.0000017	0.0000017				
Tin Sn				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 2-A-3
Scenario 2

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter												
TDS				140	121	125	145	145				
TSS				4.0	5.9	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN												
Sulphate				2.8	2.7	2.9	3.0	3.0				
Chloride				61	61	59	63	63				
Total Ammonia				0.008	0.011	0.017	0.016	0.016				
Nitrate				0.03	0.03	0.03	0.03	0.03				
Nitrite				0.003	0.003	0.003	0.003	0.003				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca				9	8	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.018	0.024	0.020	0.020				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.51	0.51	0.51	0.51	0.51				
Silver Ag				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000017	0.0000017	0.0000017	0.0000017	0.0000017				
Tin Sn				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 2-A-3
Scenario 2

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter												
TDS				140	121	125	145	145				
TSS				4.0	5.9	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN												
Sulphate				2.8	2.7	2.8	3.0	3.0				
Chloride				61	61	59	63	63				
Total Ammonia				0.005	0.008	0.014	0.013	0.013				
Nitrate				0.01	0.01	0.01	0.01	0.01				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00000	0.00000	0.00000	0.00000				
Bismuth Bi				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000025	0.0000025	0.0000020	0.0000020	0.0000020				
Calcium Ca				8	8	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.018	0.024	0.020	0.020				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.50	0.50	0.50	0.50	0.50				
Silver Ag				0.0000008	0.0000010	0.0000006	0.0000007	0.0000007				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th												
Tin Sn				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000025	0.000030	0.000038	0.000031	0.000031				
Vanadium V				0.0006	0.0000	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0032	0.0028	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 2-A-3
Scenario 2

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter												
TDS				140	121	125	145	145				
TSS				4.0	5.9	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN												
Sulphate				2.8	2.7	2.8	3.0	3.0				
Chloride				61	61	59	63	63				
Total Ammonia				0.005	0.008	0.014	0.013	0.013				
Nitrate				0.01	0.01	0.01	0.01	0.01				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00000	0.00000	0.00000	0.00000				
Bismuth Bi				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000025	0.0000025	0.0000020	0.0000020	0.0000020				
Calcium Ca				8	8	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.018	0.024	0.020	0.020				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.50	0.50	0.50	0.50	0.50				
Silver Ag				0.0000008	0.0000010	0.0000006	0.0000007	0.0000007				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th												
Tin Sn				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000025	0.000030	0.000038	0.000031	0.000031				
Vanadium V				0.0006	0.0000	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0032	0.0028	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 2-A-3
Scenario 2

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter												
TDS				140	135	125	145	145				
TSS				4.0	5.8	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN					0.002							
Sulphate				2.8	4.6	2.8	3.0	3.0				
Chloride				61	70	59	63	63				
Total Ammonia				0.005	0.008	0.014	0.013	0.013				
Nitrate				0.01	0.10	0.01	0.01	0.01				
Nitrite				0.0020	0.0019	0.002	0.002	0.002				
Alkalinity				28	26	27	27	27				
OrthoPhosphate-P				0.0008	0.0047	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0213	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	44	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0012	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0005	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0033	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00002	0.00000	0.00000	0.00000				
Bismuth Bi				0.00003	0.00037	0.00003	0.00003	0.00003				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000025	0.0000038	0.0000020	0.0000020	0.0000020				
Calcium Ca				8	13	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0003	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0017	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00002	0.00007	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0029	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000006	0.0000007	0.0000006	0.0000006	0.0000006				
Molybdenum Mo				0.00016	0.00033	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0007	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.023	0.024	0.020	0.020				
Potassium K				2.8	3.2	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.50	0.58	0.50	0.50	0.50				
Silver Ag				0.0000008	0.0000052	0.0000006	0.0000007	0.0000007				
Sodium Na				39	34	34	32	32				
Strontium Sr				0.041	0.043	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th					0.0000010							
Tin Sn				0.00040	0.00044	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000025	0.000031	0.000038	0.000031	0.000031				
Vanadium V				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0036	0.0028	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 2-A-3
Scenario 2

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter												
TDS				163	121	147	145	172				
TSS				4.0	5.9	5.9	7.0	6.8				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.002		0.002		0.003				
Sulphate				4.9	2.7	4.8	3.0	5.5				
Chloride				76	61	74	63	82				
Total Ammonia				0.005	0.008	0.013	0.013	0.012				
Nitrate				0.10	0.01	0.10	0.01	0.12				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				28	25	28	27	27				
OrthoPhosphate-P				0.0050	0.0008	0.0048	0.0008	0.0059				
Phosphate-P				0.0203	0.0179	0.0273	0.0195	0.0239				
Org. Carbon				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3				47	43	44	44	45				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0007	0.0008	0.0031	0.0005	0.0009				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0030	0.0032	0.0031	0.0031	0.0033				
Beryllium Be				0.00002	0.00000	0.00002	0.00000	0.00003				
Bismuth Bi				0.00040	0.00003	0.00038	0.00003	0.00048				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000039	0.0000025	0.0000034	0.0000020	0.0000038				
Calcium Ca				14	8	13	7	14				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0003	0.0001	0.0011	0.0001	0.0004				
Copper Cu				0.0014	0.0015	0.0014	0.0015	0.0017				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00003	0.00006	0.00005	0.00004	0.00005				
Lithium Li				0.0029	0.0028	0.0029	0.0028	0.0029				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000008	0.0000006	0.0000008	0.0000006	0.0000009				
Molybdenum Mo				0.00035	0.00015	0.00036	0.00016	0.00039				
Nickel Ni				0.0006	0.0006	0.0006	0.0004	0.0007				
Phosphorus P				0.022	0.018	0.029	0.020	0.026				
Potassium K				3.6	2.4	3.2	2.3	3.4				
Selenium Se				0.00088	0.00057	0.00061	0.00056	0.00056				
Silicon SiO2				0.59	0.50	0.59	0.50	0.61				
Silver Ag				0.0000054	0.0000010	0.0000053	0.0000007	0.0000067				
Sodium Na				43	33	38	32	37				
Strontium Sr				0.041	0.042	0.037	0.040	0.041				
Tellurium Te				0.049	0.050	0.050	0.050	0.049				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000011		0.0000012		0.0000016				
Tin Sn				0.00045	0.00040	0.00044	0.00040	0.00046				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000030	0.000039	0.000031	0.000033				
Vanadium V				0.0006	0.0000	0.0003	0.0001	0.0003				
Zinc Zn				0.0014	0.0032	0.0033	0.0017	0.0023				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

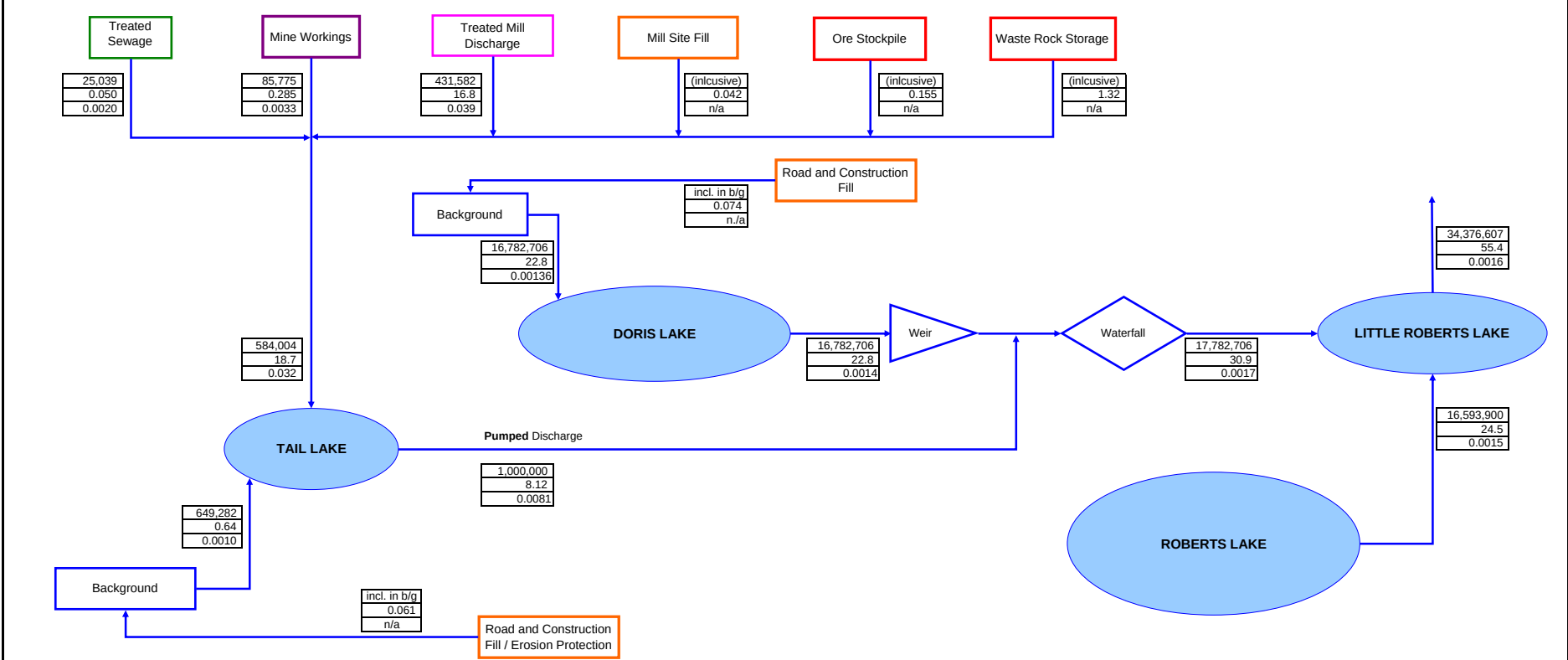
Table H 2-A-3
Scenario 2

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16	Year 10 Jan-17
Parameter												
TDS				161	121	146	145	145				
TSS				4.0	5.9	5.9	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.002		0.002						
Sulphate				4.7	2.7	4.7	3.0	3.0				
Chloride				76	61	73	63	63				
Total Ammonia				0.005	0.008	0.013	0.013	0.013				
Nitrate				0.08	0.01	0.08	0.01	0.01				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				28	25	28	27	27				
OrthoPhosphate-P				0.0047	0.0008	0.0045	0.0008	0.0008				
Phosphate-P				0.0200	0.0179	0.0271	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3				47	43	44	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0007	0.0008	0.0031	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0030	0.0032	0.0031	0.0031	0.0031				
Beryllium Be				0.00002	0.00000	0.00002	0.00000	0.00000				
Bismuth Bi				0.00038	0.00003	0.00036	0.00003	0.00003				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000039	0.0000025	0.0000033	0.0000020	0.0000020				
Calcium Ca				14	8	13	7	7				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0003	0.0001	0.0011	0.0001	0.0001				
Copper Cu				0.0014	0.0015	0.0014	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00003	0.00006	0.00005	0.00004	0.00004				
Lithium Li				0.0029	0.0028	0.0029	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000008	0.0000006	0.0000008	0.0000006	0.0000006				
Molybdenum Mo				0.00034	0.00015	0.00035	0.00016	0.00016				
Nickel Ni				0.0006	0.0006	0.0006	0.0004	0.0004				
Phosphorus P				0.022	0.018	0.029	0.020	0.020				
Potassium K				3.6	2.4	3.2	2.3	2.3				
Selenium Se				0.00088	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.59	0.50	0.58	0.50	0.50				
Silver Ag				0.0000055	0.0000010	0.0000053	0.0000007	0.0000007				
Sodium Na				43	33	38	32	32				
Strontium Sr				0.041	0.042	0.037	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000012		0.0000013						
Tin Sn				0.00044	0.00040	0.00044	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0061	0.0060	0.0060				
Uranium U				0.000026	0.000030	0.000039	0.000031	0.000031				
Vanadium V				0.0006	0.0000	0.0003	0.0001	0.0001				
Zinc Zn				0.0014	0.0032	0.0032	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

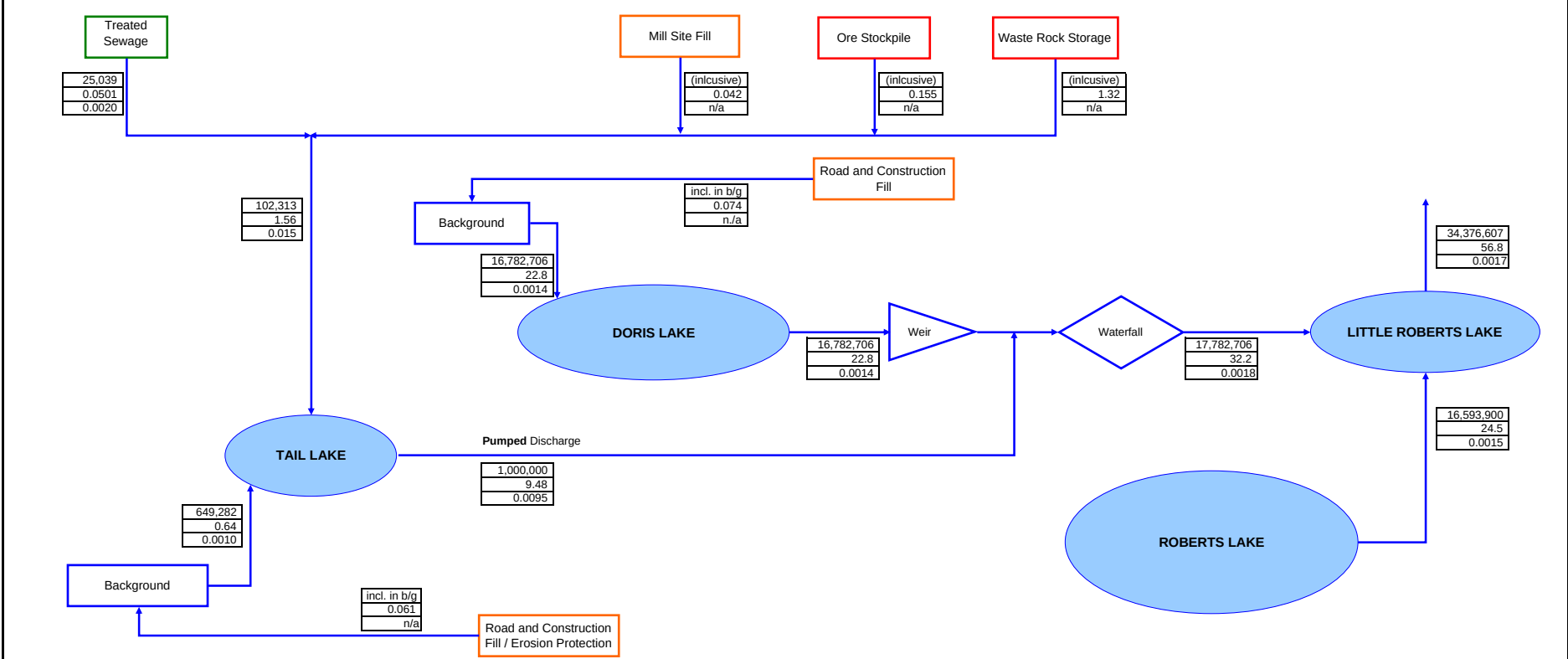
SCENARIO 3 - OPERATIONAL CONDITIONS

Year 2



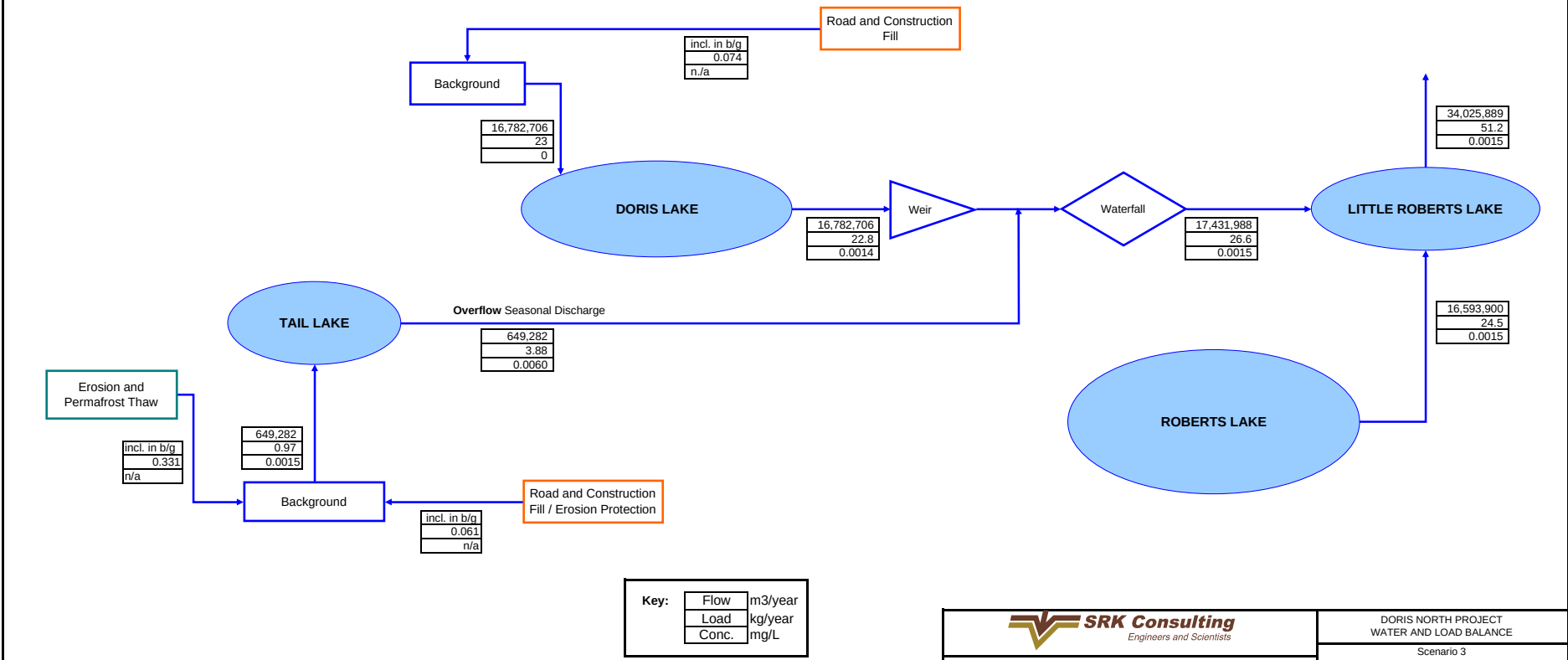
POST MILLING OPERATIONAL CONDITIONS

Year 3



POST CLOSURE CONDITIONS

Year 5

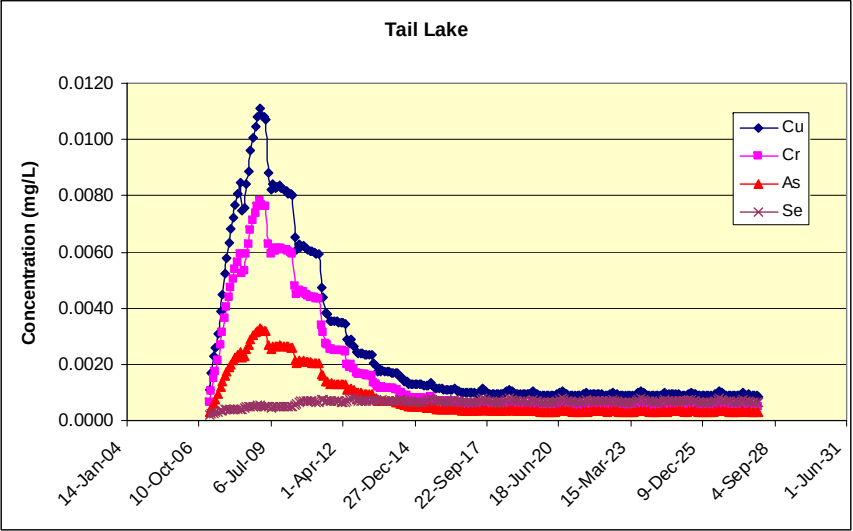
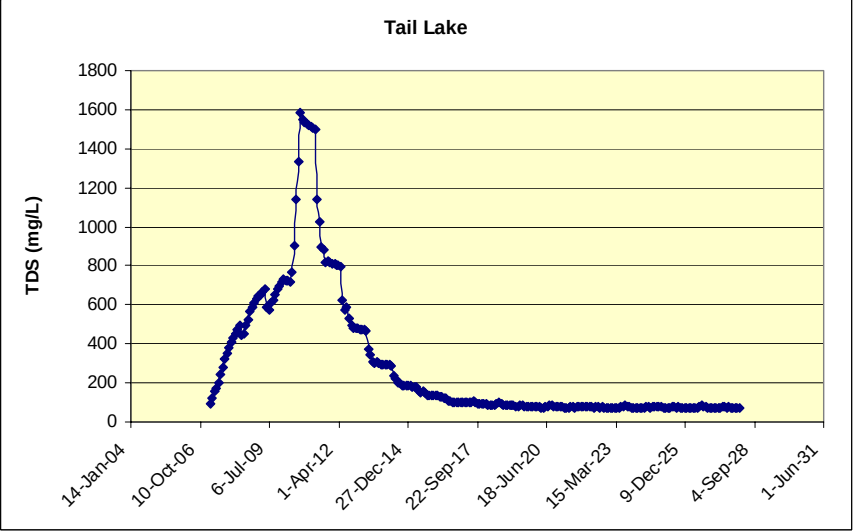
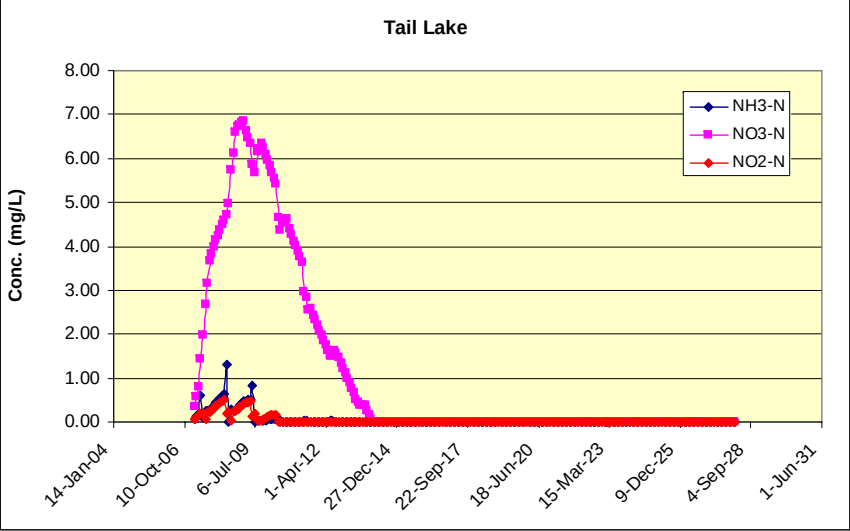
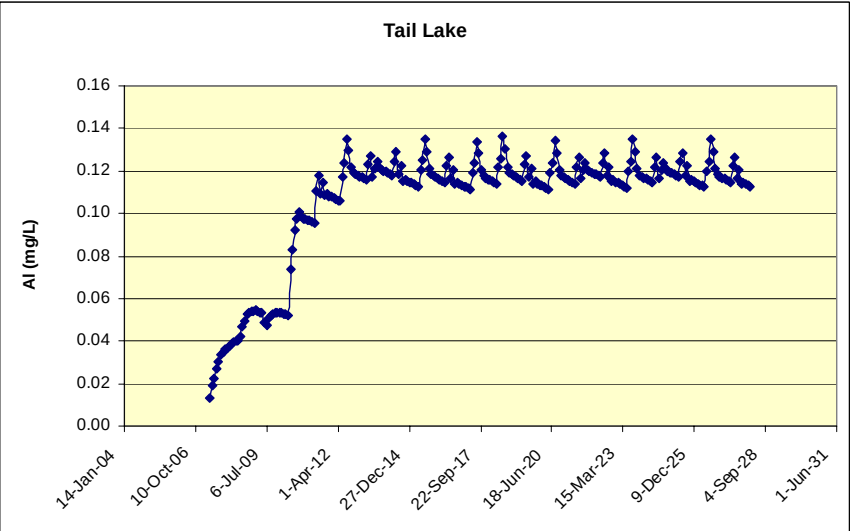
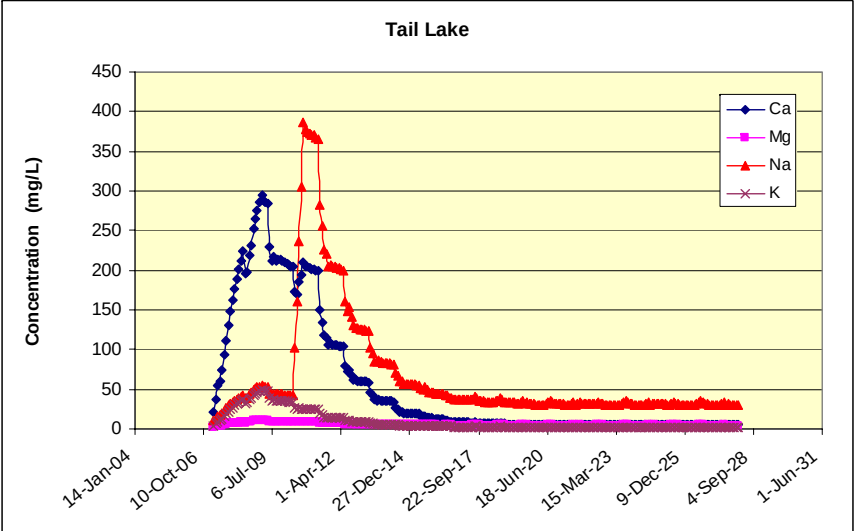
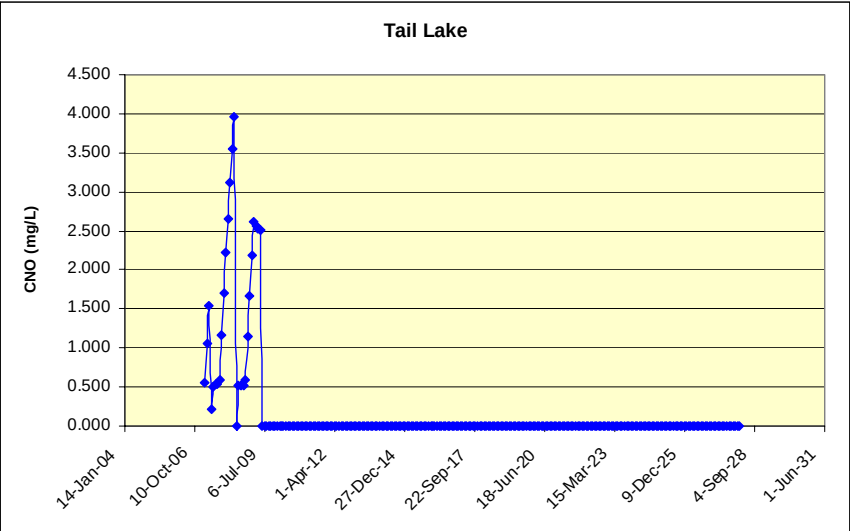
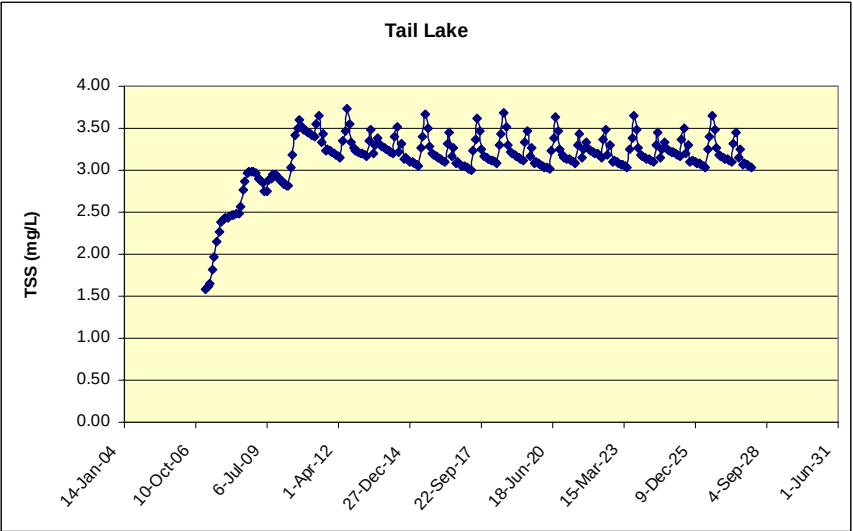
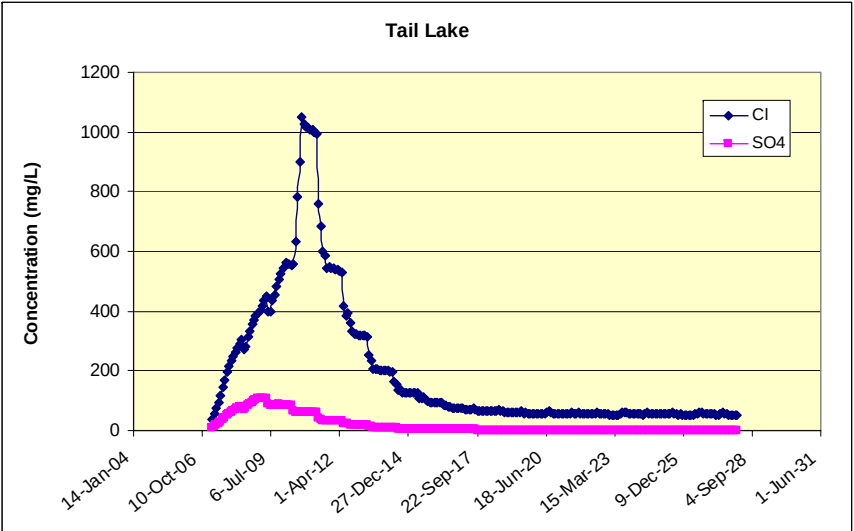
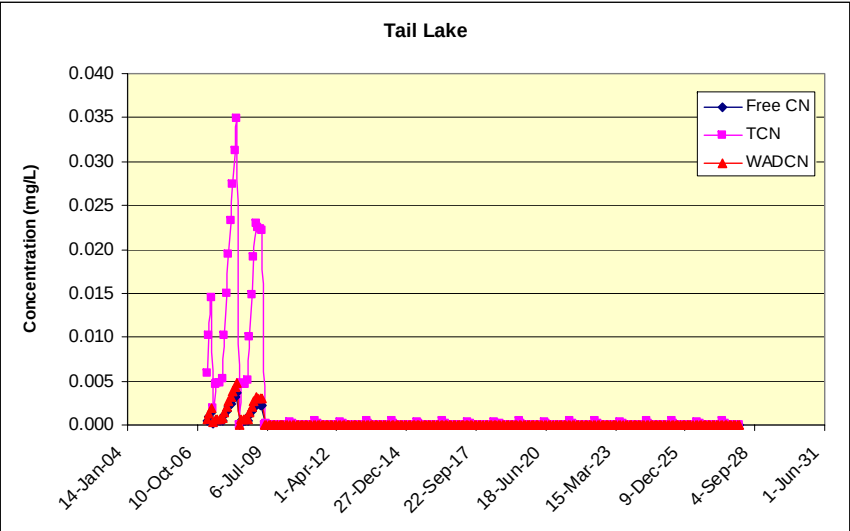


Key:

Flow	m3/year
Load	kg/year
Conc.	mg/L

MIRAMAR HOPE BAY LIMITED	DORIS NORTH PROJECT WATER AND LOAD BALANCE			
	Scenario 3 No Erosion Control			
	PROJECT: 1CM014.06	Date: Oct-05	Approved: JTC	FIGURE H-3

Scenario 3



Scenario 3 Base Case degradation

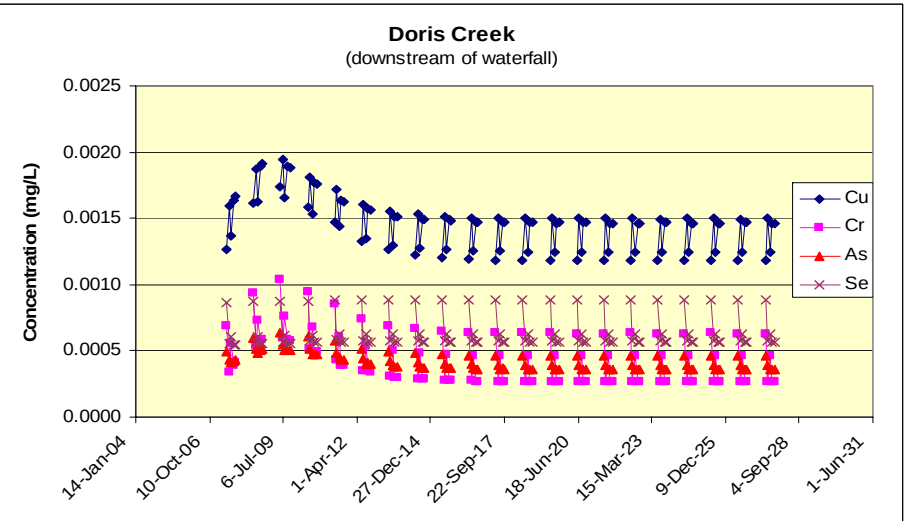
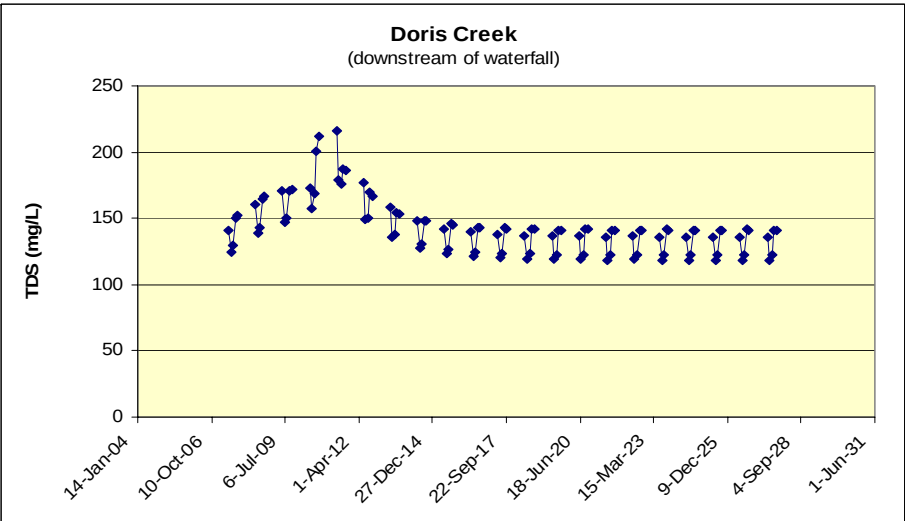
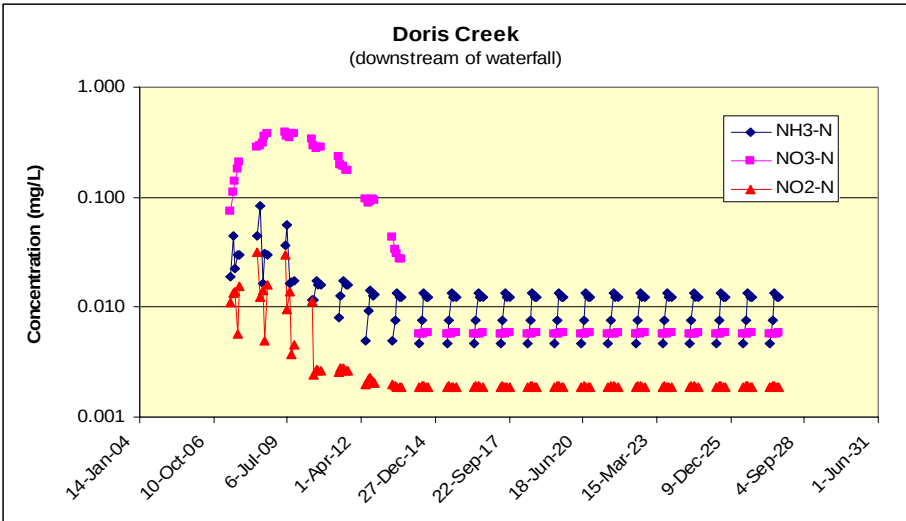
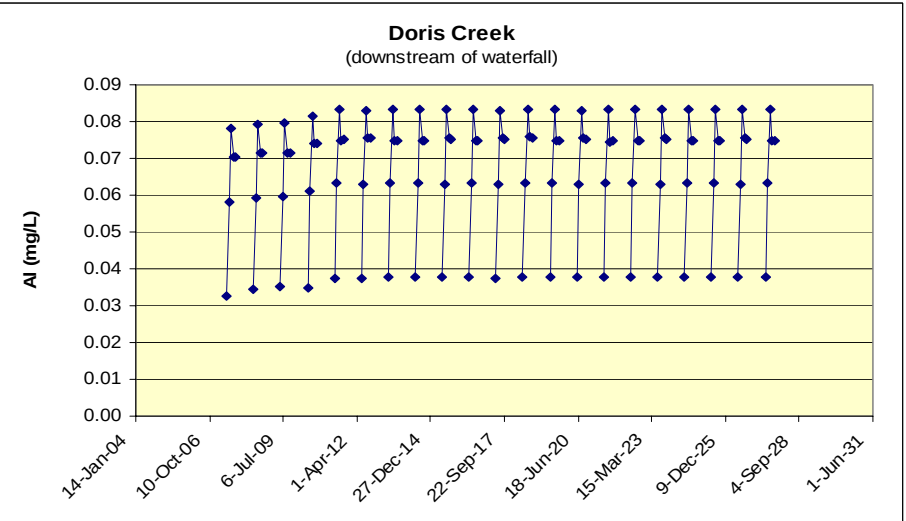
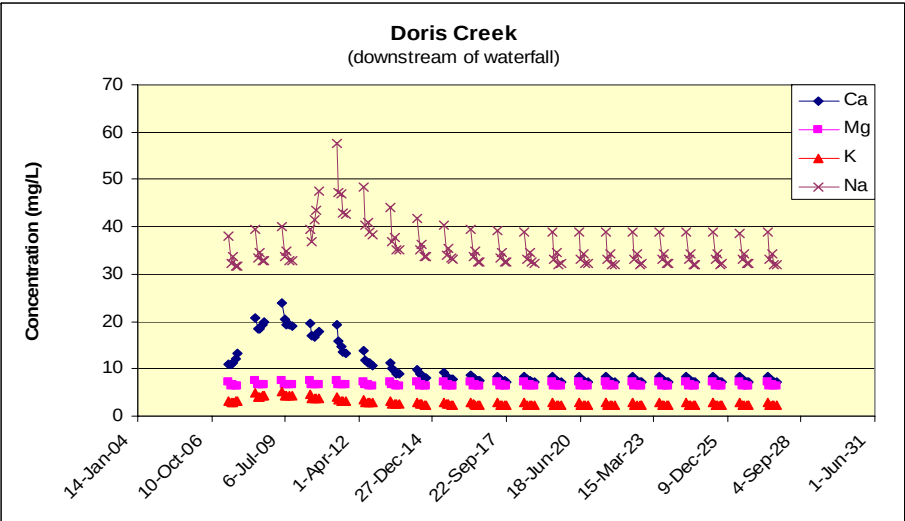
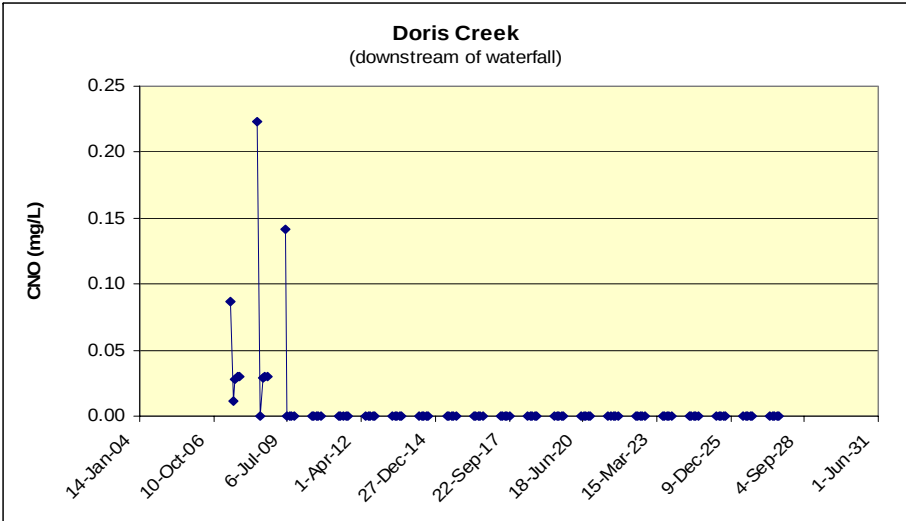
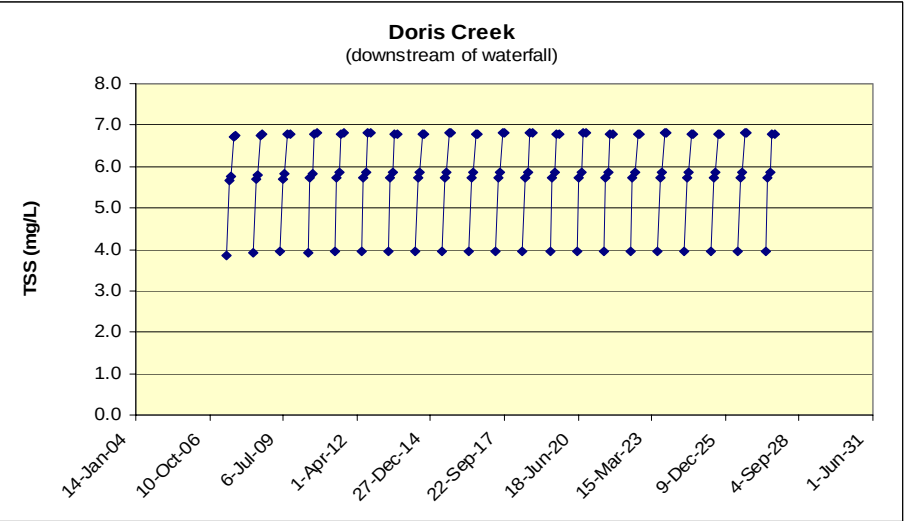
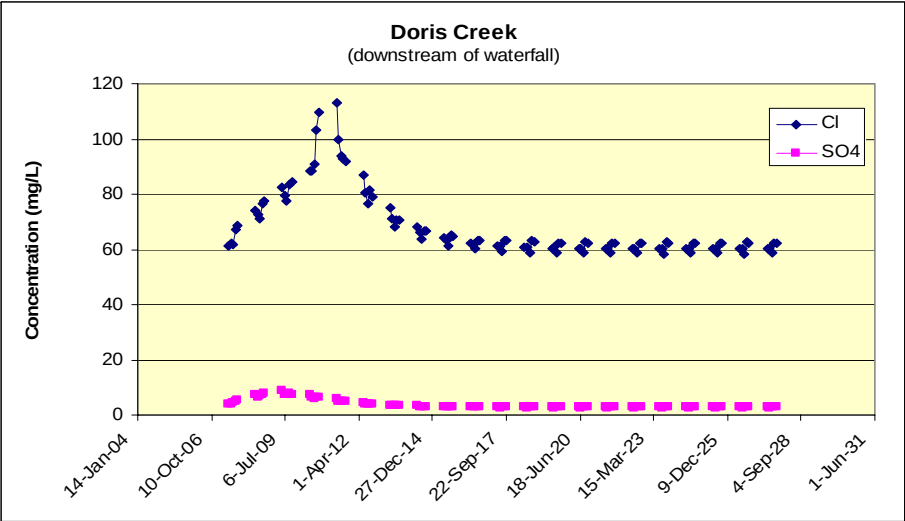
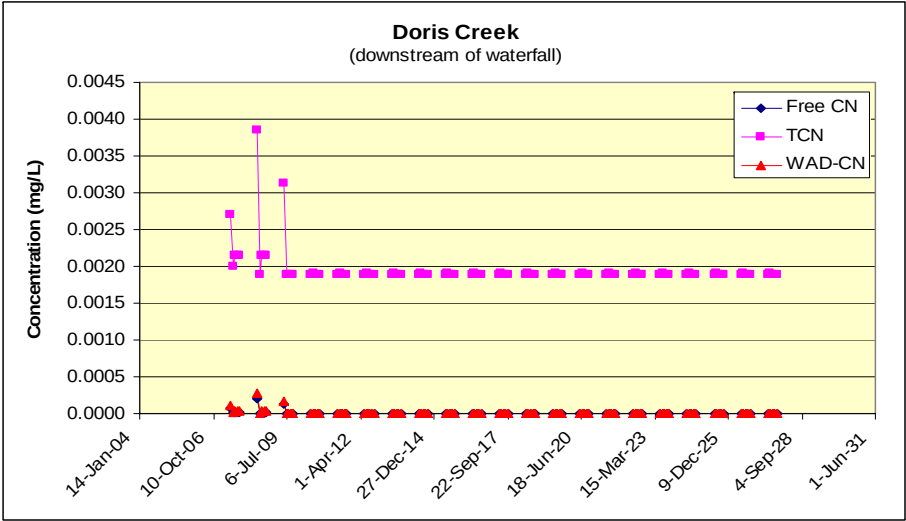


Table H-3-A-1
Scenario 3

OUTPUT SUMMARY						Fraction of CCME in Doris Creek (%)	
Discharge rate		1000000 m³/year					
Degradation Field(age)		Tail Lk Cu < CME Year		8			
		MMER	CCME	Tail Lake Year 2	Doris Creek Year 3	L'Roberts L Year 3	
Maximum Concentration							
pH			6 to 9	7 to 8	7 to 8	7 to 8	
TDS	mg/L			1583	216	199	
TSS	mg/L			3.7	6.8	8.1	
Free CN	mg/L		0.005	0.0036	0.00020	0.00010	4%
Total CN	mg/L	1.0		0.035	0.004	0.003	
WAD CN	mg/L			0.0048	0.0003	0.0001	
CNO	mg/L			4.0	0.22	0.12	
SCN	mg/L			0.118	0.006	0.003	
Sulphate	mg/L			109	8.7	7.1	
Chloride	mg/L			1051	113	91	
Total Ammonia	mg/L		0.97	1.31	0.084	0.045	9%
Nitrate	mg/L		2.9	6.8	0.39	0.20	13%
Nitrite	mg/L		0.018	0.53	0.032	0.018	175%
Alkalinity	mg/L			64	29	27	
OrthoPhosphate-P	mg/L			0.2149	0.0126	0.0071	
Phosphate-P	mg/L			0.2183	0.0315	0.0302	
Org. Carbon	mg/L			4.8	7.3	7.1	
Hardness CaCO3	mg/L			127	50	47	
Total Metals							
Aluminum Al	mg/L		0.1	0.14	0.08	0.25	83%
Antimony Sb	mg/L			0.0194	0.0035	0.0021	
Arsenic As	mg/L	0.5	0.005	0.00	0.0006	0.0006	13%
Barium Ba	mg/L			0.0125	0.0035	0.0054	
Beryllium Be	mg/L			0.00071	0.00005	0.00003	
Bismuth Bi	mg/L			0.01877	0.00107	0.00064	
Boron B	mg/L			0.034	0.034	0.030	
Cadmium Cd	mg/L		0.000038	0.000066	0.0000067	0.0000164	18%
Calcium Ca	mg/L			295	24	16	
Chromium Cr	mg/L		0.001	0.0078	0.0010	0.001	103%
Cobalt Co	mg/L			0.0123	0.0013	0.0006	
Copper Cu	mg/L	0.3	0.002	0.011	0.00194	0.0021	97%
Iron Fe	mg/L		0.3	0.15	0.13	0.28	42%
Lead Pb	mg/L	0.2	0.002	0.00047	0.00008	0.00027	4%
Lithium Li	mg/L			0.0055	0.0029	0.0029	
Magnesium Mg	mg/L			10.6	7.5	7.4	
Manganese Mn	mg/L			0.034	0.021	0.025	
Mercury Hg	mg/L		0.0001	0.0000107	0.00000118	0.0000009	1%
Molybdenum Mo	mg/L		0.073	0.0107	0.00073	0.00048	1%
Nickel Ni	mg/L	0.5	0.025	0.010	0.0010	0.0009	4%
Phosphorus P	mg/L			0.305	0.036	0.033	
Potassium K	mg/L			49	5.3	4.1	
Selenium Se	mg/L		0.001	0.00081	0.0009	0.00084	89%
Silicon SiO2	mg/L			4.6	0.73	0.63	
Silver Ag	mg/L		0.0001	0.00013	0.0000088	0.0000073	9%
Sodium Na	mg/L			386	58	48	
Strontium Sr	mg/L			0.104	0.044	0.048	
Tellurium Te	mg/L			0.039	0.049	0.051	
Thallium Tl	mg/L		0.0008	0.000048	0.000031	0.0020	4%
Thorium Th	mg/L			0.000057	0.0000044	0.0000023	
Tin Sn	mg/L			0.00296	0.00054	0.00009	
Titanium Ti	mg/L			0.0115	0.0063	0.0063	
Uranium U	mg/L			0.000081	0.000042	0.000045	
Vanadium V	mg/L			0.0041	0.0007	0.0005	
Zinc Zn	mg/L	0.5	0.03	0.027	0.0042	0.0057	14%
Zirconium Zr	mg/L			0.0045	0.0050	0.0051	

Table H-3-A-2
Scenario 3

Water Quality in TAIL LAKE

Date		Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter													
TDS	mg/L	92	124	156	173	202	245	280	321	353	381	407	429
TSS	mg/L	1.6	1.6	1.6	1.8	2.0	2.2	2.3	2.4	2.4	2.4	2.4	2.4
Free CN	mg/L	0.00050	0.00096	0.00141	0.00019	0.00046	0.00049	0.00048	0.00054	0.00105	0.00155	0.00201	0.00241
Total CN	mg/L	0.006	0.010	0.015	0.002	0.005	0.005	0.005	0.005	0.010	0.015	0.019	0.023
WAD CN	mg/L	0.0007	0.0013	0.0019	0.0003	0.0006	0.0007	0.0006	0.0007	0.0014	0.0021	0.0027	0.0032
CNO	mg/L	0.55	1.06	1.55	0.21	0.50	0.54	0.53	0.59	1.16	1.70	2.22	2.65
SCN	mg/L	0.008	0.014	0.021	0.023	0.029	0.037	0.043	0.052	0.058	0.064	0.070	0.075
Sulphate	mg/L	7.5	13.4	19.3	22.9	28.5	36.1	42.4	49.8	55.5	60.6	65.5	69.5
Chloride	mg/L	37	57	77	95	118	147	171	197	216	233	248	262
Total Ammonia	mg/L	0.070	0.133	0.194	0.598	1.05	0.264	0.265	0.261	0.327	0.388	0.446	0.495
Nitrate	mg/L	0.35	0.58	0.80	1.42	1.97	2.69	3.15	3.65	3.84	3.99	4.13	4.24
Nitrite	mg/L	0.054	0.102	0.150	0.195	0.202	0.057	0.233	0.234	0.285	0.331	0.375	0.413
Alkalinity	mg/L	16	18	21	23	26	30	34	37	40	42	44	45
OrthoPhosphate-P	mg/L	0.0107	0.0195	0.0282	0.0313	0.0381	0.0486	0.0572	0.0678	0.0765	0.0842	0.0916	0.0978
Phosphate-P	mg/L	0.0142	0.0229	0.0315	0.0349	0.0416	0.0522	0.0608	0.0714	0.0800	0.0877	0.0949	0.1010
Org. Carbon	mg/L	3.0	2.9	2.8	3.1	3.4	3.6	3.6	3.6	3.6	3.5	3.3	3.3
Hardness CaCO3	mg/L	23	29	35	38	45	53	60	68	74	78	83	87
Total Metals													
Aluminum Al	mg/L	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.03	0.04	0.04	0.04
Antimony Sb	mg/L	0.0007	0.0012	0.0018	0.0034	0.0046	0.0057	0.0067	0.0076	0.0080	0.0084	0.0088	0.0090
Arsenic As	mg/L	0.0003	0.0004	0.0006	0.0008	0.0010	0.0012	0.0014	0.0016	0.0018	0.0019	0.0020	0.0021
Barium Ba	mg/L	0.0015	0.0022	0.0028	0.0032	0.0038	0.0046	0.0053	0.0062	0.0068	0.0073	0.0078	0.0082
Beryllium Be	mg/L	0.00012	0.00014	0.00016	0.00022	0.00027	0.00031	0.00034	0.00037	0.00039	0.00040	0.00041	0.00042
Bismuth Bi	mg/L	0.00057	0.00108	0.00159	0.00318	0.00435	0.00540	0.00636	0.00716	0.00759	0.00794	0.00827	0.00854
Boron B	mg/L	0.007	0.008	0.009	0.012	0.014	0.016	0.018	0.020	0.021	0.021	0.022	0.022
Cadmium Cd	mg/L	0.0000044	0.0000075	0.0000105	0.0000152	0.0000196	0.0000244	0.0000286	0.0000328	0.0000356	0.0000381	0.0000404	0.0000423
Calcium Ca	mg/L	21	38	54	61	74	94	111	131	148	162	176	188
Chromium Cr	mg/L	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.004	0.004	0.004	0.005	0.005
Cobalt Co	mg/L	0.0008	0.0015	0.0022	0.0025	0.0031	0.0039	0.0046	0.0055	0.0062	0.0068	0.0074	0.0078
Copper Cu	mg/L	0.0011	0.0017	0.0023	0.0026	0.0031	0.0039	0.0045	0.0052	0.0058	0.0063	0.0068	0.0072
Iron Fe	mg/L	0.02	0.02	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.05	0.05	0.05
Lead Pb	mg/L	0.00005	0.00007	0.00009	0.00012	0.00016	0.00019	0.00022	0.00025	0.00027	0.00028	0.00029	0.00031
Lithium Li	mg/L	0.0019	0.0020	0.0022	0.0025	0.0028	0.0031	0.0034	0.0037	0.0038	0.0039	0.0040	0.0041
Magnesium Mg	mg/L	2.5	2.9	3.3	3.8	4.4	5.2	5.7	6.3	6.7	7.0	7.3	7.5
Manganese Mn	mg/L	0.002	0.004	0.006	0.007	0.009	0.011	0.013	0.015	0.017	0.019	0.020	0.022
Mercury Hg	mg/L	0.0000006	0.0000010	0.0000013	0.0000017	0.0000021	0.0000026	0.0000030	0.0000035	0.0000037	0.0000040	0.0000042	0.0000044
Molybdenum Mo	mg/L	0.00072	0.00134	0.00194	0.00217	0.00265	0.00338	0.00398	0.00472	0.00532	0.00586	0.00638	0.00681
Nickel Ni	mg/L	0.0008	0.0013	0.0019	0.0022	0.0027	0.0034	0.0040	0.0046	0.0051	0.0056	0.0060	0.0063
Phosphorus P	mg/L	0.020	0.033	0.047	0.056	0.069	0.087	0.102	0.119	0.132	0.144	0.155	0.165
Potassium K	mg/L	3.8	6.6	9.3	10.4	12.6	15.9	18.7	22.0	24.7	27.2	29.5	31.4
Selenium Se	mg/L	0.00022	0.00023	0.00024	0.00027	0.00031	0.00034	0.00036	0.00038	0.00039	0.00040	0.00040	0.00041
Silicon SiO2	mg/L	0.70	0.92	1.14	1.30	1.53	1.85	2.10	2.39	2.60	2.79	2.96	3.11
Silver Ag	mg/L	0.0000525	0.0000537	0.0000548	0.0000682	0.0000773	0.0000833	0.0000866	0.0000906	0.0000915	0.0000915	0.0000916	0.0000915
Sodium Na	mg/L	11	13	16	17	20	24	26	30	32	34	36	38
Strontium Sr	mg/L	0.017	0.021	0.026	0.029	0.035	0.042	0.047	0.054	0.059	0.063	0.067	0.070
Tellurium Te	mg/L	0.025	0.024	0.024	0.026	0.028	0.029	0.030	0.030	0.030	0.029	0.028	0.027
Thallium Tl	mg/L	0.000017	0.000018	0.000019	0.000022	0.000025	0.000028	0.000031	0.000033	0.000034	0.000035	0.000035	0.000036
Thorium Th	mg/L				0.000007	0.000011	0.000013	0.000016	0.000017	0.000016	0.000016	0.000015	0.000015
Tin Sn	mg/L	0.00013	0.00021	0.00028	0.00053	0.00073	0.00090	0.00106	0.00118	0.00124	0.00129	0.00133	0.00137
Titanium Ti	mg/L	0.0030	0.0030	0.0029	0.0033	0.0036	0.0039	0.0040	0.0041	0.0041	0.0040	0.0039	0.0038
Uranium U	mg/L	0.000025	0.000025	0.000024	0.000034	0.000039	0.000042	0.000044	0.000045	0.000044	0.000043	0.000042	0.000041
Vanadium V	mg/L	0.0004	0.0006	0.0007	0.0010	0.0013	0.0015	0.0017	0.0020	0.0021	0.0022	0.0023	0.0024
Zinc Zn	mg/L	0.0020	0.0034	0.0049	0.0057	0.0070	0.0089	0.0107	0.0125	0.0139	0.0152	0.0164	0.0174
Zirconium Zr	mg/L	0.0025	0.0024	0.0023	0.0027	0.0030	0.0032	0.0033	0.0033	0.0033	0.0032	0.0031	0.0030

Table H-3-A-2
Scenario 3

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter													
TDS	mg/L	454	475	497	443	450	496	523	564	589	609	628	643
TSS	mg/L	2.5	2.5	2.5	2.5	2.6	2.8	2.9	3.0	3.0	3.0	3.0	3.0
Free CN	mg/L	0.00284	0.00322	0.00360		0.00047	0.00048	0.00048	0.00053	0.00104	0.00152	0.00198	0.00238
Total CN	mg/L	0.027	0.031	0.035		0.005	0.005	0.005	0.005	0.010	0.015	0.019	0.023
WAD CN	mg/L	0.0038	0.0043	0.0048		0.0006	0.0006	0.0006	0.0007	0.0014	0.0020	0.0026	0.0032
CNO	mg/L	3.12	3.55	3.96		0.52	0.53	0.52	0.58	1.14	1.68	2.18	2.61
SCN	mg/L	0.080	0.085	0.090	0.078	0.079	0.087	0.092	0.100	0.106	0.110	0.115	0.118
Sulphate	mg/L	74.1	78.0	81.9	72.6	74.0	82.2	87.1	94.3	99.0	102.6	106.1	108.9
Chloride	mg/L	277	290	302	274	282	313	332	357	372	384	395	404
Total Ammonia	mg/L	0.549	0.596	0.643	1.310		0.275	0.260	0.257	0.322	0.382	0.440	0.488
Nitrate	mg/L	4.38	4.49	4.60	4.71	4.97	5.75	6.11	6.60	6.71	6.77	6.82	6.84
Nitrite	mg/L	0.454	0.490	0.526	0.178	0.208	0.045	0.240	0.240	0.290	0.336	0.379	0.415
Alkalinity	mg/L	47	49	50	46	48	52	55	58	60	62	63	64
OrthoPhosphate-P	mg/L	0.1047	0.1107	0.1167	0.1014	0.1024	0.1138	0.1204	0.1308	0.1379	0.1436	0.1490	0.1535
Phosphate-P	mg/L	0.1079	0.1138	0.1197	0.1048	0.1057	0.1172	0.1237	0.1341	0.1412	0.1467	0.1521	0.1565
Org. Carbon	mg/L	3.2	3.1	3.0	3.2	3.5	3.7	3.7	3.8	3.7	3.6	3.4	3.4
Hardness CaCO3	mg/L	91	95	99	89	91	101	106	113	118	121	124	127
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Antimony Sb	mg/L	0.0094	0.0097	0.0100	0.0099	0.0105	0.0117	0.0125	0.0134	0.0137	0.0139	0.0141	0.0142
Arsenic As	mg/L	0.0022	0.0023	0.0024	0.0022	0.0023	0.0025	0.0027	0.0029	0.0030	0.0031	0.0032	0.0033
Barium Ba	mg/L	0.0087	0.0091	0.0095	0.0085	0.0087	0.0096	0.0102	0.0110	0.0114	0.0118	0.0122	0.0125
Beryllium Be	mg/L	0.00043	0.00044	0.00045	0.00045	0.00048	0.00052	0.00055	0.00058	0.00059	0.00059	0.00060	0.00060
Bismuth Bi	mg/L	0.00887	0.00913	0.00940	0.00934	0.01000	0.01113	0.01191	0.01269	0.01299	0.01316	0.01332	0.01345
Boron B	mg/L	0.023	0.024	0.024	0.023	0.025	0.027	0.029	0.030	0.031	0.031	0.032	0.032
Cadmium Cd	mg/L	0.0000445	0.0000464	0.0000483	0.0000451	0.0000470	0.0000522	0.0000555	0.0000596	0.0000618	0.0000634	0.0000649	0.0000661
Calcium Ca	mg/L	201	213	224	195	197	219	232	252	265	276	286	295
Chromium Cr	mg/L	0.005	0.006	0.006	0.005	0.005	0.006	0.006	0.007	0.007	0.007	0.008	0.008
Cobalt Co	mg/L	0.0084	0.0088	0.0093	0.0082	0.0083	0.0092	0.0097	0.0106	0.0111	0.0116	0.0120	0.0123
Copper Cu	mg/L	0.0077	0.0081	0.0085	0.0075	0.0076	0.0084	0.0089	0.0096	0.0101	0.0104	0.0108	0.0111
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06
Lead Pb	mg/L	0.00032	0.00033	0.00034	0.00033	0.00034	0.00038	0.00040	0.00043	0.00044	0.00045	0.00046	0.00047
Lithium Li	mg/L	0.0042	0.0043	0.0044	0.0042	0.0044	0.0047	0.0050	0.0052	0.0053	0.0054	0.0054	0.0055
Magnesium Mg	mg/L	7.8	8.0	8.3	7.7	8.0	8.8	9.2	9.8	10.1	10.3	10.5	10.6
Manganese Mn	mg/L	0.023	0.024	0.026	0.023	0.023	0.025	0.027	0.029	0.031	0.032	0.033	0.034
Mercury Hg	mg/L	0.0000046	0.0000048	0.0000050	0.0000047	0.0000049	0.0000054	0.0000057	0.0000061	0.0000063	0.0000065	0.0000067	0.0000068
Molybdenum Mo	mg/L	0.00729	0.00771	0.00812	0.00706	0.00714	0.00793	0.00839	0.00912	0.00961	0.01001	0.01038	0.01069
Nickel Ni	mg/L	0.0067	0.0071	0.0074	0.0066	0.0067	0.0075	0.0079	0.0085	0.0090	0.0093	0.0096	0.0098
Phosphorus P	mg/L	0.175	0.184	0.193	0.172	0.176	0.195	0.206	0.223	0.234	0.242	0.250	0.257
Potassium K	mg/L	33.6	35.4	37.3	32.5	32.9	36.5	38.6	41.9	44.1	45.9	47.6	49.0
Selenium Se	mg/L	0.00041	0.00042	0.00042	0.00042	0.00044	0.00048	0.00049	0.00052	0.00052	0.00052	0.00052	0.00052
Silicon SiO2	mg/L	3.27	3.41	3.56	3.22	3.29	3.63	3.82	4.11	4.28	4.41	4.53	4.63
Silver Ag	mg/L	0.0000918	0.0000918	0.0000918	0.0000972	0.0001037	0.0001103	0.0001128	0.0001168	0.0001170	0.0001162	0.0001154	0.0001147
Sodium Na	mg/L	40	41	43	39	40	44	46	49	51	52	54	55
Strontium Sr	mg/L	0.074	0.077	0.080	0.072	0.074	0.081	0.086	0.092	0.096	0.099	0.101	0.104
Tellurium Te	mg/L	0.026	0.026	0.025	0.027	0.028	0.030	0.031	0.031	0.030	0.029	0.029	0.028
Thallium Tl	mg/L	0.000037	0.000037	0.000038	0.000037	0.000039	0.000042	0.000044	0.000046	0.000047	0.000047	0.000048	0.000048
Thorium Th	mg/L	0.000014	0.000014	0.000014	0.000018	0.000021	0.000023	0.000025	0.000026	0.000026	0.000025	0.000024	0.000023
Tin Sn	mg/L	0.00141	0.00145	0.00149	0.00149	0.00161	0.00179	0.00191	0.00203	0.00207	0.00209	0.00211	0.00213
Titanium Ti	mg/L	0.0038	0.0037	0.0037	0.0039	0.0041	0.0044	0.0045	0.0046	0.0046	0.0045	0.0044	0.0043
Uranium U	mg/L	0.000040	0.000039	0.000038	0.000045	0.000049	0.000053	0.000054	0.000055	0.000054	0.000053	0.000051	0.000050
Vanadium V	mg/L	0.0025	0.0026	0.0027	0.0026	0.0027	0.0030	0.0031	0.0034	0.0034	0.0035	0.0036	0.0036
Zinc Zn	mg/L	0.0185	0.0194	0.0204	0.0180	0.0183	0.0203	0.0217	0.0236	0.0247	0.0256	0.0264	0.0271
Zirconium Zr	mg/L	0.0029	0.0028	0.0027	0.0030	0.0032	0.0034	0.0036	0.0036	0.0035	0.0034	0.0033	0.0032

Table H-3-A-2
Scenario 3

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter													
TDS	mg/L	652	668	684	589	573	612	624	654	679	698	716	733
TSS	mg/L	2.9	2.9	2.9	2.7	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.9
Free CN	mg/L	0.00232	0.00230	0.00228									
Total CN	mg/L	0.022	0.022	0.022			0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L	0.0031	0.0031	0.0030									
CNO	mg/L	2.56	2.54	2.51									
SCN	mg/L	0.116	0.115	0.114	0.092	0.084	0.086	0.084	0.084	0.084	0.083	0.082	0.082
Sulphate	mg/L	107.1	106.8	106.4	88.2	82.9	85.8	84.9	86.1	86.8	86.5	86.3	86.2
Chloride	mg/L	416	434	451	399	399	435	452	481	506	525	545	563
Total Ammonia	mg/L	0.488	0.495	0.501	0.816		0.028	0.032	0.020	0.032	0.044	0.056	0.067
Nitrate	mg/L	6.61	6.48	6.35	5.86	5.69	6.16	6.21	6.34	6.25	6.10	5.96	5.82
Nitrite	mg/L	0.435	0.458	0.482	0.124	0.200	0.023	0.036	0.037	0.069	0.101	0.133	0.161
Alkalinity	mg/L	63	62	62	53	51	53	53	53	53	52	52	52
OrthoPhosphate-P	mg/L	0.1595	0.1671	0.1749	0.1501	0.1478	0.1611	0.1673	0.1789	0.1895	0.1982	0.2070	0.2149
Phosphate-P	mg/L	0.1624	0.1700	0.1778	0.1535	0.1511	0.1645	0.1707	0.1823	0.1929	0.2016	0.2104	0.2183
Org. Carbon	mg/L	3.3	3.3	3.2	3.5	3.7	4.0	4.0	4.1	4.1	4.0	4.0	4.0
Hardness CaCO3	mg/L	124	123	122	103	98	101	100	101	101	100	99	98
Total Metals													
Aluminum Al	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Antimony Sb	mg/L	0.0144	0.0148	0.0152	0.0142	0.0146	0.0159	0.0166	0.0175	0.0181	0.0185	0.0190	0.0194
Arsenic As	mg/L	0.0032	0.0032	0.0032	0.0027	0.0026	0.0026	0.0026	0.0027	0.0027	0.0027	0.0026	0.0026
Barium Ba	mg/L	0.0122	0.0122	0.0121	0.0101	0.0095	0.0098	0.0097	0.0098	0.0098	0.0098	0.0097	0.0096
Beryllium Be	mg/L	0.00060	0.00061	0.00062	0.00058	0.00059	0.00063	0.00065	0.00067	0.00069	0.00070	0.00070	0.00071
Bismuth Bi	mg/L	0.01369	0.01408	0.01448	0.01361	0.01399	0.01528	0.01603	0.01691	0.01751	0.01794	0.01837	0.01877
Boron B	mg/L	0.031	0.031	0.031	0.029	0.028	0.030	0.030	0.031	0.031	0.031	0.031	0.031
Cadmium Cd	mg/L	0.0000647	0.0000642	0.0000637	0.0000538	0.0000511	0.0000529	0.0000525	0.0000531	0.0000531	0.0000526	0.0000522	0.0000518
Calcium Ca	mg/L	288	286	284	230	213	217	212	213	214	211	209	208
Chromium Cr	mg/L	0.008	0.008	0.008	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
Cobalt Co	mg/L	0.0121	0.0120	0.0119	0.0097	0.0090	0.0093	0.0091	0.0092	0.0092	0.0091	0.0091	0.0090
Copper Cu	mg/L	0.0109	0.0108	0.0107	0.0088	0.0082	0.0084	0.0083	0.0083	0.0083	0.0083	0.0082	0.0081
Iron Fe	mg/L	0.06	0.06	0.06	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Lead Pb	mg/L	0.00046	0.00046	0.00047	0.00041	0.00040	0.00042	0.00043	0.00044	0.00045	0.00045	0.00045	0.00045
Lithium Li	mg/L	0.0054	0.0053	0.0053	0.0049	0.0048	0.0051	0.0051	0.0052	0.0052	0.0052	0.0052	0.0052
Magnesium Mg	mg/L	10.5	10.4	10.4	9.2	9.0	9.4	9.4	9.6	9.6	9.6	9.5	9.5
Manganese Mn	mg/L	0.033	0.033	0.033	0.027	0.025	0.026	0.025	0.025	0.026	0.025	0.025	0.025
Mercury Hg	mg/L	0.0000066	0.0000066	0.0000065	0.0000056	0.0000053	0.0000055	0.0000055	0.0000055	0.0000056	0.0000055	0.0000055	0.0000054
Molybdenum Mo	mg/L	0.01047	0.01038	0.01030	0.00834	0.00770	0.00787	0.00768	0.00772	0.00772	0.00765	0.00758	0.00752
Nickel Ni	mg/L	0.0096	0.0096	0.0096	0.0080	0.0076	0.0078	0.0078	0.0079	0.0079	0.0079	0.0079	0.0079
Phosphorus P	mg/L	0.261	0.269	0.277	0.237	0.231	0.248	0.254	0.268	0.279	0.288	0.297	0.305
Potassium K	mg/L	47.9	47.5	47.1	38.3	35.4	36.2	35.3	35.5	35.5	35.2	34.8	34.5
Selenium Se	mg/L	0.00051	0.00051	0.00050	0.00047	0.00047	0.00049	0.00049	0.00050	0.00050	0.00049	0.00049	0.00049
Silicon SiO2	mg/L	4.53	4.50	4.46	3.77	3.56	3.67	3.62	3.65	3.66	3.62	3.59	3.57
Silver Ag	mg/L	0.0001133	0.0001133	0.0001134	0.0001130	0.0001161	0.0001214	0.0001218	0.0001243	0.0001255	0.0001254	0.0001254	0.0001254
Sodium Na	mg/L	54	53	53	45	43	44	43	44	44	43	43	43
Strontium Sr	mg/L	0.101	0.101	0.100	0.084	0.080	0.083	0.082	0.083	0.083	0.082	0.081	0.081
Tellurium Te	mg/L	0.027	0.027	0.027	0.029	0.030	0.032	0.033	0.034	0.034	0.033	0.033	0.033
Thallium Tl	mg/L	0.000047	0.000046	0.000046	0.000042	0.000042	0.000044	0.000044	0.000044	0.000044	0.000044	0.000044	0.000043
Thorium Th	mg/L	0.000023	0.000023	0.000022	0.000022	0.000023	0.000025	0.000026	0.000027	0.000027	0.000027	0.000026	0.000026
Tin Sn	mg/L	0.00216	0.00222	0.00228	0.00215	0.00222	0.00243	0.00255	0.00269	0.00278	0.00284	0.00290	0.00296
Titanium Ti	mg/L	0.0042	0.0042	0.0042	0.0044	0.0046	0.0048	0.0050	0.0051	0.0051	0.0051	0.0051	0.0051
Uranium U	mg/L	0.000049	0.000049	0.000049	0.000051	0.000054	0.000056	0.000057	0.000058	0.000058	0.000058	0.000058	0.000057
Vanadium V	mg/L	0.0036	0.0037	0.0037	0.0034	0.0034	0.0036	0.0037	0.0038	0.0039	0.0040	0.0040	0.0041
Zinc Zn	mg/L	0.0266	0.0265	0.0263	0.0217	0.0203	0.0210	0.0209	0.0212	0.0213	0.0212	0.0211	0.0210
Zirconium Zr	mg/L	0.0031	0.0031	0.0031	0.0033	0.0035	0.0037	0.0038	0.0039	0.0039	0.0038	0.0038	0.0038

Table H-3-A-2
Scenario 3

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter													
TDS	mg/L	728	724	721	769	903	1140	1337	1583	1546	1535	1527	1521
TSS	mg/L	2.8	2.8	2.8	3.0	3.2	3.4	3.5	3.6	3.5	3.5	3.5	3.5
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.081	0.081	0.080	0.063	0.057	0.059	0.057	0.058	0.057	0.056	0.056	0.056
Sulphate	mg/L	85.5	85.1	84.7	66.8	61.1	62.8	61.3	61.9	60.5	60.0	59.7	59.5
Chloride	mg/L	558	556	553	559	635	782	900	1051	1026	1019	1014	1010
Total Ammonia	mg/L	0.067	0.066	0.066	0.016	0.017	0.008	0.012	0.004	0.004	0.004	0.004	0.004
Nitrate	mg/L	5.68	5.56	5.43	4.64	4.37	4.56	4.53	4.61	4.40	4.26	4.13	4.00
Nitrite	mg/L	0.159	0.159	0.158		0.005	0.003	0.003	0.002	0.002	0.002	0.002	0.002
Alkalinity	mg/L	51	51	51	44	43	45	44	45	44	44	44	43
OrthoPhosphate-P	mg/L	0.2133	0.2123	0.2112	0.1659	0.1513	0.1553	0.1512	0.1528	0.1492	0.1482	0.1474	0.1468
Phosphate-P	mg/L	0.2166	0.2156	0.2144	0.1718	0.1579	0.1626	0.1588	0.1605	0.1568	0.1557	0.1548	0.1543
Org. Carbon	mg/L	3.9	3.9	3.9	4.1	4.3	4.6	4.7	4.8	4.7	4.6	4.6	4.6
Hardness CaCO3	mg/L	97	97	96	81	77	81	80	81	79	79	78	78
Total Metals													
Aluminum Al	mg/L	0.05	0.05	0.05	0.07	0.08	0.09	0.10	0.10	0.10	0.10	0.10	0.10
Antimony Sb	mg/L	0.0192	0.0191	0.0190	0.0150	0.0137	0.0140	0.0137	0.0138	0.0135	0.0134	0.0133	0.0133
Arsenic As	mg/L	0.0026	0.0026	0.0026	0.0022	0.0020	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021
Barium Ba	mg/L	0.0096	0.0095	0.0095	0.0077	0.0072	0.0075	0.0074	0.0075	0.0073	0.0072	0.0072	0.0072
Beryllium Be	mg/L	0.00071	0.00070	0.00070	0.00059	0.00056	0.00058	0.00057	0.00058	0.00056	0.00056	0.00056	0.00055
Bismuth Bi	mg/L	0.01862	0.01853	0.01844	0.01447	0.01319	0.01354	0.01318	0.01332	0.01301	0.01292	0.01285	0.01280
Boron B	mg/L	0.031	0.031	0.031	0.030	0.031	0.033	0.033	0.034	0.033	0.033	0.033	0.033
Cadmium Cd	mg/L	0.0000514	0.0000511	0.0000509	0.0000438	0.0000422	0.0000442	0.0000443	0.0000452	0.0000442	0.0000439	0.0000436	0.0000435
Calcium Ca	mg/L	206	205	204	172	169	186	195	210	205	204	203	202
Chromium Cr	mg/L	0.006	0.006	0.006	0.005	0.004	0.005	0.005	0.005	0.004	0.004	0.004	0.004
Cobalt Co	mg/L	0.0090	0.0089	0.0089	0.0070	0.0064	0.0066	0.0064	0.0065	0.0063	0.0063	0.0062	0.0062
Copper Cu	mg/L	0.0081	0.0080	0.0080	0.0065	0.0061	0.0063	0.0062	0.0062	0.0061	0.0061	0.0060	0.0060
Iron Fe	mg/L	0.06	0.06	0.06	0.08	0.09	0.10	0.10	0.11	0.11	0.10	0.10	0.10
Lead Pb	mg/L	0.00045	0.00045	0.00044	0.00037	0.00035	0.00037	0.00036	0.00037	0.00036	0.00036	0.00035	0.00035
Lithium Li	mg/L	0.0051	0.0051	0.0051	0.0048	0.0048	0.0051	0.0051	0.0053	0.0051	0.0051	0.0051	0.0050
Magnesium Mg	mg/L	9.4	9.4	9.4	8.4	8.3	8.7	8.7	8.9	8.7	8.6	8.6	8.5
Manganese Mn	mg/L	0.025	0.025	0.025	0.020	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019
Mercury Hg	mg/L	0.0000054	0.0000054	0.0000053	0.0000067	0.0000074	0.0000081	0.0000084	0.0000087	0.0000085	0.0000084	0.0000084	0.0000084
Molybdenum Mo	mg/L	0.00746	0.00743	0.00739	0.00585	0.00535	0.00550	0.00536	0.00542	0.00529	0.00526	0.00523	0.00521
Nickel Ni	mg/L	0.0078	0.0078	0.0078	0.0062	0.0057	0.0059	0.0058	0.0058	0.0057	0.0056	0.0056	0.0056
Phosphorus P	mg/L	0.302	0.301	0.299	0.238	0.218	0.224	0.219	0.221	0.216	0.215	0.214	0.213
Potassium K	mg/L	34.3	34.1	33.9	27.2	25.0	25.8	25.2	25.5	24.9	24.8	24.6	24.5
Selenium Se	mg/L	0.00048	0.00048	0.00048	0.00057	0.00061	0.00066	0.00068	0.00070	0.00069	0.00068	0.00068	0.00068
Silicon SiO2	mg/L	3.54	3.52	3.50	2.99	2.85	2.97	2.95	3.00	2.93	2.91	2.89	2.88
Silver Ag	mg/L	0.0001244	0.0001239	0.0001232	0.0001182	0.0001189	0.0001232	0.0001216	0.0001234	0.0001205	0.0001197	0.0001190	0.0001185
Sodium Na	mg/L	42	42	42	102	161	237	306	386	377	375	373	371
Strontium Sr	mg/L	0.080	0.080	0.079	0.068	0.065	0.068	0.068	0.069	0.067	0.067	0.066	0.066
Tellurium Te	mg/L	0.032	0.032	0.032	0.034	0.035	0.037	0.038	0.039	0.038	0.038	0.038	0.038
Thallium Tl	mg/L	0.000043	0.000043	0.000042	0.000040	0.000039	0.000042	0.000042	0.000043	0.000042	0.000042	0.000041	0.000041
Thorium Th	mg/L	0.000026	0.000026	0.000026	0.000033	0.000037	0.000041	0.000044	0.000045	0.000044	0.000044	0.000044	0.000044
Tin Sn	mg/L	0.00294	0.00292	0.00291	0.00231	0.00214	0.00221	0.00217	0.00219	0.00214	0.00213	0.00211	0.00211
Titanium Ti	mg/L	0.0050	0.0050	0.0050	0.0065	0.0072	0.0079	0.0083	0.0085	0.0083	0.0083	0.0082	0.0082
Uranium U	mg/L	0.000057	0.000057	0.000056	0.000063	0.000067	0.000072	0.000073	0.000075	0.000073	0.000073	0.000072	0.000072
Vanadium V	mg/L	0.0040	0.0040	0.0040	0.0035	0.0033	0.0035	0.0034	0.0035	0.0034	0.0034	0.0034	0.0033
Zinc Zn	mg/L	0.0209	0.0208	0.0207	0.0165	0.0152	0.0158	0.0157	0.0160	0.0156	0.0155	0.0154	0.0153
Zirconium Zr	mg/L	0.0037	0.0037	0.0037	0.0039	0.0040	0.0043	0.0044	0.0045	0.0044	0.0044	0.0044	0.0044

Table H-3-A-2
Scenario 3

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter													
TDS	mg/L	1515	1507	1499	1141	1028	900	880	817	822	816	812	809
TSS	mg/L	3.4	3.4	3.4	3.5	3.7	3.3	3.4	3.2	3.3	3.2	3.2	3.2
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.055	0.055	0.055	0.041	0.036	0.032	0.031	0.029	0.029	0.029	0.028	0.028
Sulphate	mg/L	59.2	58.9	58.6	44.2	39.7	34.7	33.9	31.5	31.7	31.4	31.3	31.2
Chloride	mg/L	1006	1001	995	759	685	600	587	545	548	545	542	540
Total Ammonia	mg/L	0.004	0.004	0.004	0.034	0.017	0.008	0.012	0.004	0.004	0.004	0.004	0.004
Nitrate	mg/L	3.88	3.75	3.62	2.98	2.83	2.54	2.57	2.41	2.32	2.20	2.08	1.97
Nitrite	mg/L	0.002	0.002	0.002	0.007	0.007	0.003	0.003	0.002	0.002	0.002	0.002	0.002
Alkalinity	mg/L	43	43	43	37	36	32	32	30	31	30	30	30
OrthoPhosphate-P	mg/L	0.1462	0.1455	0.1446	0.1083	0.0966	0.0844	0.0821	0.0762	0.0766	0.0761	0.0757	0.0754
Phosphate-P	mg/L	0.1536	0.1529	0.1520	0.1178	0.1066	0.0935	0.0915	0.0850	0.0855	0.0850	0.0845	0.0842
Org. Carbon	mg/L	4.6	4.6	4.5	4.6	4.8	4.4	4.5	4.2	4.2	4.2	4.2	4.2
Hardness CaCO3	mg/L	78	77	77	64	61	55	55	51	51	51	51	51
Total Metals													
Aluminum Al	mg/L	0.10	0.10	0.10	0.11	0.12	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Antimony Sb	mg/L	0.0132	0.0132	0.0131	0.0098	0.0088	0.0077	0.0075	0.0070	0.0070	0.0070	0.0069	0.0069
Arsenic As	mg/L	0.0021	0.0020	0.0020	0.0017	0.0016	0.0014	0.0014	0.0013	0.0013	0.0013	0.0013	0.0013
Barium Ba	mg/L	0.0071	0.0071	0.0071	0.0056	0.0052	0.0046	0.0046	0.0043	0.0043	0.0043	0.0043	0.0042
Beryllium Be	mg/L	0.00055	0.00055	0.00055	0.00046	0.00044	0.00038	0.00038	0.00035	0.00035	0.00035	0.00035	0.00035
Bismuth Bi	mg/L	0.01275	0.01268	0.01261	0.00943	0.00840	0.00733	0.00714	0.00662	0.00666	0.00662	0.00658	0.00656
Boron B	mg/L	0.033	0.033	0.032	0.031	0.032	0.029	0.030	0.028	0.028	0.028	0.028	0.028
Cadmium Cd	mg/L	0.0000433	0.0000431	0.0000428	0.0000365	0.0000353	0.0000317	0.0000322	0.0000303	0.0000305	0.0000302	0.0000301	0.0000300
Calcium Ca	mg/L	201	200	199	150	134	118	115	106	107	106	106	105
Chromium Cr	mg/L	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002
Cobalt Co	mg/L	0.0062	0.0062	0.0061	0.0046	0.0041	0.0036	0.0035	0.0033	0.0033	0.0033	0.0033	0.0032
Copper Cu	mg/L	0.0060	0.0059	0.0059	0.0047	0.0044	0.0039	0.0038	0.0035	0.0036	0.0035	0.0035	0.0035
Iron Fe	mg/L	0.10	0.10	0.10	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.11
Lead Pb	mg/L	0.00035	0.00035	0.00035	0.00029	0.00027	0.00024	0.00024	0.00023	0.00023	0.00023	0.00022	0.00022
Lithium Li	mg/L	0.0050	0.0050	0.0050	0.0047	0.0047	0.0043	0.0043	0.0041	0.0041	0.0041	0.0040	0.0040
Magnesium Mg	mg/L	8.5	8.5	8.4	7.6	7.4	6.7	6.8	6.4	6.4	6.4	6.3	6.3
Manganese Mn	mg/L	0.019	0.018	0.018	0.015	0.013	0.012	0.012	0.011	0.011	0.011	0.011	0.011
Mercury Hg	mg/L	0.0000083	0.0000083	0.0000082	0.0000092	0.0000097	0.0000089	0.0000093	0.0000088	0.0000088	0.0000088	0.0000087	0.0000087
Molybdenum Mo	mg/L	0.00519	0.00516	0.00513	0.00389	0.00350	0.00306	0.00299	0.00277	0.00279	0.00277	0.00276	0.00275
Nickel Ni	mg/L	0.0056	0.0055	0.0055	0.0043	0.0039	0.0034	0.0033	0.0031	0.0031	0.0031	0.0031	0.0031
Phosphorus P	mg/L	0.212	0.211	0.210	0.160	0.144	0.126	0.123	0.115	0.115	0.115	0.114	0.114
Potassium K	mg/L	24.4	24.3	24.2	18.7	17.0	14.9	14.7	13.6	13.7	13.6	13.6	13.5
Selenium Se	mg/L	0.00067	0.00067	0.00067	0.00073	0.00076	0.00070	0.00072	0.00068	0.00068	0.00068	0.00068	0.00067
Silicon SiO2	mg/L	2.87	2.85	2.84	2.41	2.30	2.05	2.05	1.92	1.93	1.92	1.91	1.90
Silver Ag	mg/L	0.0001181	0.0001175	0.0001168	0.0001130	0.0001140	0.0001006	0.0000996	0.0000929	0.0000935	0.0000928	0.0000923	0.0000920
Sodium Na	mg/L	370	368	366	282	256	225	221	205	206	205	204	203
Strontium Sr	mg/L	0.066	0.065	0.065	0.055	0.053	0.047	0.048	0.045	0.045	0.045	0.044	0.044
Tellurium Te	mg/L	0.038	0.037	0.037	0.038	0.039	0.036	0.037	0.034	0.035	0.034	0.034	0.034
Thallium Tl	mg/L	0.000041	0.000041	0.000041	0.000038	0.000038	0.000034	0.000035	0.000033	0.000033	0.000033	0.000033	0.000032
Thorium Th	mg/L	0.000043	0.000043	0.000043	0.000047	0.000051	0.000047	0.000050	0.000047	0.000048	0.000047	0.000047	0.000047
Tin Sn	mg/L	0.00210	0.00209	0.00208	0.00159	0.00145	0.00128	0.00126	0.00117	0.00118	0.00117	0.00117	0.00116
Titanium Ti	mg/L	0.0081	0.0081	0.0081	0.0092	0.0097	0.0089	0.0093	0.0088	0.0088	0.0088	0.0087	0.0087
Uranium U	mg/L	0.000072	0.000071	0.000071	0.000075	0.000079	0.000071	0.000073	0.000069	0.000069	0.000069	0.000068	0.000068
Vanadium V	mg/L	0.0033	0.0033	0.0033	0.0029	0.0027	0.0024	0.0024	0.0023	0.0023	0.0023	0.0023	0.0023
Zinc Zn	mg/L	0.0153	0.0152	0.0151	0.0117	0.0106	0.0094	0.0095	0.0089	0.0089	0.0089	0.0088	0.0088
Zirconium Zr	mg/L	0.0043	0.0043	0.0043	0.0044	0.0045	0.0041	0.0042	0.0040	0.0040	0.0040	0.0039	0.0039

Table H-3-A-2
Scenario 3

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter													
TDS	mg/L	806	802	797	624	570	589	534	494	483	480	477	475
TSS	mg/L	3.2	3.2	3.2	3.3	3.5	3.7	3.6	3.3	3.3	3.2	3.2	3.2
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.028	0.028	0.028	0.021	0.019	0.019	0.017	0.016	0.016	0.016	0.016	0.015
Sulphate	mg/L	31.0	30.9	30.7	23.7	21.5	22.2	20.1	18.6	18.1	18.0	17.9	17.8
Chloride	mg/L	538	535	532	418	383	396	359	333	325	323	321	320
Total Ammonia	mg/L	0.004	0.004	0.004	0.033	0.017	0.009	0.013	0.004	0.004	0.004	0.004	0.004
Nitrate	mg/L	1.86	1.74	1.63	1.49	1.51	1.63	1.57	1.48	1.34	1.22	1.11	1.00
Nitrite	mg/L	0.002	0.002	0.002	0.006	0.007	0.003	0.003	0.002	0.002	0.002	0.002	0.002
Alkalinity	mg/L	30	30	30	27	28	29	27	25	25	25	25	24
OrthoPhosphate-P	mg/L	0.0751	0.0748	0.0743	0.0565	0.0508	0.0522	0.0470	0.0434	0.0424	0.0421	0.0419	0.0418
Phosphate-P	mg/L	0.0839	0.0834	0.0830	0.0668	0.0615	0.0638	0.0579	0.0536	0.0524	0.0520	0.0517	0.0516
Org. Carbon	mg/L	4.1	4.1	4.1	4.3	4.5	4.8	4.6	4.3	4.2	4.1	4.1	4.1
Hardness CaCO3	mg/L	50	50	50	44	44	46	43	40	39	39	39	39
Total Metals													
Aluminum Al	mg/L	0.11	0.11	0.11	0.12	0.12	0.13	0.13	0.12	0.12	0.12	0.12	0.12
Antimony Sb	mg/L	0.0069	0.0068	0.0068	0.0052	0.0047	0.0048	0.0044	0.0040	0.0039	0.0039	0.0039	0.0039
Arsenic As	mg/L	0.0013	0.0013	0.0013	0.0011	0.0011	0.0012	0.0011	0.0010	0.0010	0.0010	0.0010	0.0010
Barium Ba	mg/L	0.0042	0.0042	0.0042	0.0035	0.0033	0.0035	0.0032	0.0030	0.0030	0.0029	0.0029	0.0029
Beryllium Be	mg/L	0.00035	0.00035	0.00034	0.00031	0.00030	0.00032	0.00029	0.00027	0.00026	0.00026	0.00026	0.00026
Bismuth Bi	mg/L	0.00653	0.00650	0.00646	0.00490	0.00440	0.00452	0.00406	0.00375	0.00367	0.00364	0.00362	0.00361
Boron B	mg/L	0.028	0.028	0.027	0.028	0.029	0.031	0.029	0.027	0.027	0.027	0.026	0.026
Cadmium Cd	mg/L	0.0000299	0.0000297	0.0000295	0.0000267	0.0000265	0.0000284	0.0000269	0.0000253	0.0000247	0.0000245	0.0000244	0.0000243
Calcium Ca	mg/L	105	104	104	80	72	75	67	62	61	61	60	60
Chromium Cr	mg/L	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Cobalt Co	mg/L	0.0032	0.0032	0.0032	0.0025	0.0022	0.0023	0.0021	0.0019	0.0019	0.0019	0.0019	0.0018
Copper Cu	mg/L	0.0035	0.0035	0.0035	0.0029	0.0028	0.0029	0.0026	0.0025	0.0024	0.0024	0.0024	0.0024
Iron Fe	mg/L	0.11	0.11	0.11	0.12	0.13	0.14	0.14	0.13	0.13	0.13	0.12	0.12
Lead Pb	mg/L	0.00022	0.00022	0.00022	0.00019	0.00019	0.00020	0.00019	0.00017	0.00017	0.00017	0.00017	0.00017
Lithium Li	mg/L	0.0040	0.0040	0.0040	0.0040	0.0040	0.0043	0.0041	0.0038	0.0037	0.0037	0.0037	0.0037
Magnesium Mg	mg/L	6.3	6.3	6.2	5.9	6.0	6.4	6.1	5.7	5.5	5.5	5.5	5.4
Manganese Mn	mg/L	0.011	0.011	0.011	0.009	0.009	0.009	0.008	0.008	0.008	0.008	0.008	0.008
Mercury Hg	mg/L	0.0000087	0.0000086	0.0000086	0.0000094	0.0000099	0.0000107	0.0000102	0.0000096	0.0000094	0.0000093	0.0000093	0.0000093
Molybdenum Mo	mg/L	0.00273	0.00272	0.00271	0.00210	0.00192	0.00198	0.00179	0.00165	0.00161	0.00160	0.00160	0.00159
Nickel Ni	mg/L	0.0031	0.0030	0.0030	0.0024	0.0023	0.0023	0.0021	0.0020	0.0019	0.0019	0.0019	0.0019
Phosphorus P	mg/L	0.113	0.113	0.112	0.088	0.080	0.083	0.075	0.070	0.068	0.068	0.067	0.067
Potassium K	mg/L	13.5	13.4	13.3	10.7	9.9	10.3	9.4	8.7	8.5	8.5	8.4	8.4
Selenium Se	mg/L	0.00067	0.00067	0.00066	0.00072	0.00076	0.00081	0.00078	0.00073	0.00071	0.00071	0.00070	0.00070
Silicon SiO2	mg/L	1.90	1.89	1.88	1.70	1.67	1.76	1.65	1.54	1.50	1.49	1.48	1.48
Silver Ag	mg/L	0.0000916	0.0000912	0.0000907	0.0000933	0.0000964	0.0001003	0.0000920	0.0000855	0.0000835	0.0000829	0.0000825	0.0000822
Sodium Na	mg/L	202	201	200	160	148	154	140	130	127	126	126	125
Strontium Sr	mg/L	0.044	0.044	0.044	0.039	0.039	0.041	0.039	0.036	0.035	0.035	0.035	0.035
Tellurium Te	mg/L	0.034	0.034	0.034	0.035	0.037	0.039	0.037	0.035	0.034	0.034	0.034	0.034
Thallium Tl	mg/L	0.000032	0.000032	0.000032	0.000031	0.000032	0.000034	0.000032	0.000030	0.000030	0.000030	0.000029	0.000029
Thorium Th	mg/L	0.000047	0.000046	0.000046	0.000050	0.000053	0.000057	0.000056	0.000052	0.000051	0.000051	0.000051	0.000050
Tin Sn	mg/L	0.00116	0.00115	0.00115	0.00090	0.00085	0.00088	0.00081	0.00075	0.00074	0.00073	0.00073	0.00072
Titanium Ti	mg/L	0.0086	0.0086	0.0086	0.0095	0.0100	0.0108	0.0103	0.0097	0.0095	0.0094	0.0093	0.0093
Uranium U	mg/L	0.000068	0.000067	0.000067	0.000072	0.000076	0.000081	0.000076	0.000072	0.000070	0.000069	0.000069	0.000069
Vanadium V	mg/L	0.0023	0.0022	0.0022	0.0021	0.0020	0.0022	0.0020	0.0019	0.0018	0.0018	0.0018	0.0018
Zinc Zn	mg/L	0.0088	0.0087	0.0087	0.0069	0.0064	0.0067	0.0064	0.0060	0.0059	0.0059	0.0058	0.0058
Zirconium Zr	mg/L	0.0039	0.0039	0.0039	0.0040	0.0042	0.0045	0.0043	0.0040	0.0039	0.0039	0.0039	0.0039

Table H-3-A-2
Scenario 3

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter													
TDS	mg/L	473	471	468	374	345	305	301	306	299	297	295	294
TSS	mg/L	3.2	3.2	3.2	3.4	3.5	3.2	3.3	3.4	3.3	3.3	3.3	3.2
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.015	0.015	0.015	0.011	0.010	0.009	0.009	0.009	0.009	0.008	0.008	0.008
Sulphate	mg/L	17.8	17.7	17.6	13.6	12.4	10.9	10.7	10.8	10.6	10.5	10.5	10.4
Chloride	mg/L	318	317	315	252	234	207	205	208	203	202	201	200
Total Ammonia	mg/L	0.004	0.004	0.004	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000
Nitrate	mg/L	0.89	0.78	0.67	0.50	0.45	0.39	0.38	0.39	0.27	0.16	0.05	
Nitrite	mg/L	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alkalinity	mg/L	24	24	24	23	24	22	22	22	22	22	22	22
OrthoPhosphate-P	mg/L	0.0416	0.0414	0.0411	0.0313	0.0281	0.0246	0.0240	0.0243	0.0237	0.0236	0.0234	0.0233
Phosphate-P	mg/L	0.0514	0.0511	0.0508	0.0424	0.0395	0.0351	0.0347	0.0352	0.0344	0.0342	0.0340	0.0338
Org. Carbon	mg/L	4.1	4.1	4.0	4.2	4.5	4.1	4.2	4.3	4.2	4.2	4.1	4.1
Hardness CaCO3	mg/L	39	38	38	35	36	32	33	34	33	33	33	32
Total Metals													
Aluminum Al	mg/L	0.12	0.12	0.12	0.12	0.13	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Antimony Sb	mg/L	0.0039	0.0038	0.0038	0.0029	0.0026	0.0023	0.0023	0.0023	0.0023	0.0022	0.0022	0.0022
Arsenic As	mg/L	0.0010	0.0010	0.0010	0.0008	0.0008	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007
Barium Ba	mg/L	0.0029	0.0029	0.0029	0.0025	0.0024	0.0022	0.0022	0.0023	0.0022	0.0022	0.0022	0.0022
Beryllium Be	mg/L	0.00026	0.00025	0.00025	0.00023	0.00023	0.00020	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019
Bismuth Bi	mg/L	0.00359	0.00358	0.00356	0.00267	0.00239	0.00209	0.00204	0.00206	0.00201	0.00199	0.00198	0.00198
Boron B	mg/L	0.026	0.026	0.026	0.026	0.027	0.024	0.025	0.026	0.025	0.025	0.025	0.025
Cadmium Cd	mg/L	0.0000242	0.0000241	0.0000239	0.0000197	0.0000184	0.0000163	0.0000162	0.0000165	0.0000161	0.0000160	0.0000159	0.0000158
Calcium Ca	mg/L	60	59	59	46	41	37	36	36	35	35	35	35
Chromium Cr	mg/L	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Cobalt Co	mg/L	0.0018	0.0018	0.0018	0.0014	0.0013	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011
Copper Cu	mg/L	0.0023	0.0023	0.0023	0.0020	0.0020	0.0018	0.0018	0.0018	0.0017	0.0017	0.0017	0.0017
Iron Fe	mg/L	0.12	0.12	0.12	0.13	0.14	0.13	0.13	0.14	0.13	0.13	0.13	0.13
Lead Pb	mg/L	0.00017	0.00016	0.00016	0.00014	0.00013	0.00012	0.00012	0.00012	0.00012	0.00011	0.00011	0.00011
Lithium Li	mg/L	0.0037	0.0036	0.0036	0.0037	0.0038	0.0035	0.0036	0.0036	0.0036	0.0035	0.0035	0.0035
Magnesium Mg	mg/L	5.4	5.4	5.4	5.3	5.4	4.9	5.1	5.2	5.1	5.0	5.0	5.0
Manganese Mn	mg/L	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
Mercury Hg	mg/L	0.0000092	0.0000092	0.0000091	0.0000096	0.0000099	0.0000091	0.0000094	0.0000096	0.0000094	0.0000093	0.0000093	0.0000092
Molybdenum Mo	mg/L	0.00158	0.00157	0.00157	0.00124	0.00114	0.00100	0.00099	0.00100	0.00097	0.00097	0.00096	0.00096
Nickel Ni	mg/L	0.0019	0.0019	0.0019	0.0015	0.0014	0.0013	0.0013	0.0013	0.0013	0.0013	0.0012	0.0012
Phosphorus P	mg/L	0.067	0.067	0.066	0.051	0.046	0.041	0.040	0.040	0.039	0.039	0.039	0.039
Potassium K	mg/L	8.3	8.3	8.3	6.9	6.5	5.7	5.7	5.8	5.7	5.6	5.6	5.6
Selenium Se	mg/L	0.00070	0.00069	0.00069	0.00073	0.00076	0.00069	0.00071	0.00073	0.00071	0.00071	0.00070	0.00070
Silicon SiO2	mg/L	1.47	1.47	1.46	1.36	1.34	1.21	1.23	1.25	1.22	1.22	1.21	1.20
Silver Ag	mg/L	0.0000819	0.0000814	0.0000810	0.0000824	0.0000842	0.0000739	0.0000723	0.0000731	0.0000714	0.0000709	0.0000705	0.0000703
Sodium Na	mg/L	125	124	123	102	96	85	85	86	84	83	83	83
Strontium Sr	mg/L	0.035	0.035	0.034	0.032	0.033	0.030	0.030	0.031	0.030	0.030	0.030	0.030
Tellurium Te	mg/L	0.034	0.033	0.033	0.035	0.036	0.033	0.034	0.035	0.034	0.034	0.034	0.034
Thallium Tl	mg/L	0.000029	0.000029	0.000029	0.000028	0.000028	0.000026	0.000026	0.000027	0.000026	0.000026	0.000026	0.000026
Thorium Th	mg/L	0.000050	0.000050	0.000050	0.000047	0.000046	0.000042	0.000043	0.000044	0.000043	0.000042	0.000042	0.000042
Tin Sn	mg/L	0.00072	0.00072	0.00071	0.00056	0.00053	0.00048	0.00048	0.00048	0.00047	0.00047	0.00047	0.00046
Titanium Ti	mg/L	0.0093	0.0092	0.0092	0.0100	0.0104	0.0096	0.0099	0.0102	0.0099	0.0098	0.0098	0.0098
Uranium U	mg/L	0.000069	0.000068	0.000068	0.000067	0.000068	0.000061	0.000060	0.000061	0.000060	0.000059	0.000059	0.000059
Vanadium V	mg/L	0.0018	0.0018	0.0018	0.0017	0.0017	0.0015	0.0015	0.0016	0.0015	0.0015	0.0015	0.0015
Zinc Zn	mg/L	0.0058	0.0058	0.0057	0.0046	0.0043	0.0039	0.0041	0.0042	0.0041	0.0041	0.0041	0.0041
Zirconium Zr	mg/L	0.0039	0.0038	0.0038	0.0039	0.0040	0.0036	0.0037	0.0038	0.0037	0.0037	0.0037	0.0037

Table H-3-A-2
Scenario 3

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter													
TDS	mg/L	293	291	289	239	225	199	198	185	186	185	184	183
TSS	mg/L	3.2	3.2	3.2	3.4	3.5	3.2	3.3	3.1	3.1	3.1	3.1	3.1
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.008	0.008	0.008	0.006	0.006	0.005	0.005	0.004	0.004	0.004	0.004	0.004
Sulphate	mg/L	10.4	10.3	10.3	8.1	7.4	6.5	6.5	6.0	6.1	6.0	6.0	6.0
Chloride	mg/L	199	198	197	163	155	137	137	128	129	128	127	127
Total Ammonia	mg/L	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000
Nitrate	mg/L				0.00	0.00	0.00	0.00	0.00				
Nitrite	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alkalinity	mg/L	21	21	21	21	22	20	20	19	19	19	19	19
OrthoPhosphate-P	mg/L	0.0233	0.0231	0.0230	0.0176	0.0158	0.0139	0.0136	0.0126	0.0127	0.0126	0.0125	0.0125
Phosphate-P	mg/L	0.0337	0.0335	0.0334	0.0292	0.0278	0.0247	0.0246	0.0230	0.0231	0.0230	0.0229	0.0228
Org. Carbon	mg/L	4.1	4.1	4.1	4.3	4.5	4.1	4.2	3.9	4.0	3.9	3.9	3.9
Hardness CaCO3	mg/L	32	32	32	31	32	29	29	28	28	28	28	27
Total Metals													
Aluminum Al	mg/L	0.12	0.12	0.12	0.12	0.13	0.12	0.12	0.12	0.12	0.12	0.11	0.11
Antimony Sb	mg/L	0.0022	0.0022	0.0022	0.0017	0.0015	0.0013	0.0013	0.0012	0.0012	0.0012	0.0012	0.0012
Arsenic As	mg/L	0.0007	0.0007	0.0007	0.0006	0.0006	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Barium Ba	mg/L	0.0022	0.0022	0.0021	0.0019	0.0019	0.0018	0.0018	0.0017	0.0017	0.0017	0.0017	0.0017
Beryllium Be	mg/L	0.00019	0.00019	0.00018	0.00018	0.00018	0.00016	0.00015	0.00014	0.00014	0.00014	0.00014	0.00014
Bismuth Bi	mg/L	0.00197	0.00196	0.00195	0.00146	0.00130	0.00114	0.00111	0.00103	0.00103	0.00102	0.00102	0.00102
Boron B	mg/L	0.025	0.024	0.024	0.025	0.026	0.023	0.024	0.023	0.023	0.023	0.023	0.023
Cadmium Cd	mg/L	0.0000158	0.0000157	0.0000156	0.0000134	0.0000128	0.0000114	0.0000114	0.0000107	0.0000107	0.0000107	0.0000106	0.0000106
Calcium Ca	mg/L	35	35	34	27	25	22	22	20	20	20	20	20
Chromium Cr	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Cobalt Co	mg/L	0.0011	0.0010	0.0010	0.0008	0.0007	0.0007	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006
Copper Cu	mg/L	0.0017	0.0017	0.0017	0.0016	0.0015	0.0014	0.0014	0.0013	0.0013	0.0013	0.0013	0.0013
Iron Fe	mg/L	0.13	0.13	0.13	0.14	0.14	0.13	0.14	0.13	0.13	0.13	0.13	0.13
Lead Pb	mg/L	0.00011	0.00011	0.00011	0.00010	0.00010	0.00009	0.00009	0.00008	0.00008	0.00008	0.00008	0.00008
Lithium Li	mg/L	0.0035	0.0035	0.0035	0.0036	0.0037	0.0034	0.0035	0.0033	0.0033	0.0033	0.0032	0.0032
Magnesium Mg	mg/L	5.0	4.9	4.9	5.0	5.1	4.7	4.8	4.5	4.5	4.5	4.5	4.5
Manganese Mn	mg/L	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004
Mercury Hg	mg/L	0.0000092	0.0000091	0.0000091	0.0000096	0.0000099	0.0000091	0.0000094	0.0000088	0.0000089	0.0000088	0.0000088	0.0000087
Molybdenum Mo	mg/L	0.00096	0.00095	0.00094	0.00077	0.00072	0.00063	0.00063	0.00058	0.00059	0.00058	0.00058	0.00058
Nickel Ni	mg/L	0.0012	0.0012	0.0012	0.0011	0.0010	0.0009	0.0009	0.0008	0.0008	0.0008	0.0008	0.0008
Phosphorus P	mg/L	0.038	0.038	0.038	0.030	0.027	0.024	0.024	0.022	0.022	0.022	0.022	0.022
Potassium K	mg/L	5.6	5.5	5.5	4.8	4.6	4.1	4.1	3.9	3.9	3.9	3.8	3.8
Selenium Se	mg/L	0.00070	0.00070	0.00069	0.00073	0.00076	0.00069	0.00071	0.00067	0.00068	0.00067	0.00067	0.00067
Silicon SiO2	mg/L	1.20	1.19	1.19	1.15	1.16	1.05	1.07	1.01	1.01	1.01	1.00	1.00
Silver Ag	mg/L	0.0000700	0.0000696	0.0000692	0.0000737	0.0000765	0.0000669	0.0000655	0.0000608	0.0000612	0.0000608	0.0000605	0.0000602
Sodium Na	mg/L	82	82	81	70	67	60	60	57	57	56	56	56
Strontium Sr	mg/L	0.030	0.030	0.029	0.029	0.029	0.027	0.027	0.026	0.026	0.026	0.026	0.026
Tellurium Te	mg/L	0.034	0.033	0.033	0.035	0.036	0.033	0.034	0.032	0.033	0.032	0.032	0.032
Thallium Tl	mg/L	0.000025	0.000025	0.000025	0.000025	0.000026	0.000023	0.000024	0.000023	0.000023	0.000023	0.000022	0.000022
Thorium Th	mg/L	0.000042	0.000042	0.000041	0.000040	0.000041	0.000037	0.000038	0.000035	0.000036	0.000035	0.000035	0.000035
Tin Sn	mg/L	0.00046	0.00046	0.00046	0.00037	0.00036	0.00032	0.00033	0.00031	0.00031	0.00031	0.00030	0.00030
Titanium Ti	mg/L	0.0097	0.0097	0.0096	0.0103	0.0107	0.0098	0.0101	0.0096	0.0096	0.0095	0.0095	0.0095
Uranium U	mg/L	0.000059	0.000058	0.000058	0.000060	0.000062	0.000055	0.000055	0.000051	0.000051	0.000051	0.000051	0.000051
Vanadium V	mg/L	0.0015	0.0015	0.0015	0.0015	0.0015	0.0014	0.0014	0.0013	0.0013	0.0013	0.0013	0.0013
Zinc Zn	mg/L	0.0041	0.0040	0.0040	0.0033	0.0031	0.0028	0.0031	0.0030	0.0030	0.0030	0.0030	0.0030
Zirconium Zr	mg/L	0.0037	0.0036	0.0036	0.0037	0.0038	0.0035	0.0036	0.0034	0.0034	0.0034	0.0034	0.0034

Table H-3-A-2
Scenario 3

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter													
TDS	mg/L	182	181	180	158	153	161	149	139	136	135	134	134
TSS	mg/L	3.1	3.1	3.1	3.3	3.4	3.7	3.5	3.3	3.2	3.2	3.2	3.1
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002
Sulphate	mg/L	5.9	5.9	5.9	4.8	4.6	4.8	4.4	4.1	4.0	4.0	4.0	3.9
Chloride	mg/L	126	126	125	110	107	113	105	98	96	95	95	94
Total Ammonia	mg/L	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000
Nitrate	mg/L				0.00	0.00	0.00	0.00	0.00				
Nitrite	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alkalinity	mg/L	19	19	19	19	20	22	20	19	19	19	18	18
OrthoPhosphate-P	mg/L	0.0124	0.0124	0.0123	0.0097	0.0088	0.0091	0.0083	0.0077	0.0075	0.0075	0.0074	0.0074
Phosphate-P	mg/L	0.0227	0.0226	0.0224	0.0211	0.0206	0.0217	0.0202	0.0188	0.0183	0.0182	0.0181	0.0180
Org. Carbon	mg/L	3.9	3.9	3.9	4.1	4.4	4.7	4.4	4.1	4.0	4.0	4.0	4.0
Hardness CaCO3	mg/L	27	27	27	27	28	30	29	27	26	26	26	26
Total Metals													
Aluminum Al	mg/L	0.11	0.11	0.11	0.12	0.12	0.14	0.13	0.12	0.12	0.12	0.12	0.12
Antimony Sb	mg/L	0.0012	0.0012	0.0012	0.0009	0.0009	0.0009	0.0009	0.0008	0.0008	0.0008	0.0008	0.0008
Arsenic As	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0004	0.0004	0.0004	0.0004	0.0004
Barium Ba	mg/L	0.0017	0.0017	0.0017	0.0016	0.0016	0.0017	0.0017	0.0016	0.0015	0.0015	0.0015	0.0015
Beryllium Be	mg/L	0.00014	0.00014	0.00014	0.00014	0.00015	0.00015	0.00014	0.00013	0.00012	0.00012	0.00012	0.00012
Bismuth Bi	mg/L	0.00101	0.00101	0.00100	0.00076	0.00069	0.00071	0.00063	0.00059	0.00057	0.00057	0.00057	0.00056
Boron B	mg/L	0.022	0.022	0.022	0.023	0.024	0.026	0.025	0.023	0.023	0.023	0.022	0.022
Cadmium Cd	mg/L	0.0000105	0.0000105	0.0000104	0.0000095	0.0000094	0.0000099	0.0000093	0.0000086	0.0000084	0.0000084	0.0000083	0.0000083
Calcium Ca	mg/L	20	20	20	16	15	16	15	14	13	13	13	13
Chromium Cr	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Cobalt Co	mg/L	0.0006	0.0006	0.0006	0.0005	0.0004	0.0005	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
Copper Cu	mg/L	0.0013	0.0013	0.0013	0.0012	0.0013	0.0013	0.0012	0.0012	0.0011	0.0011	0.0011	0.0011
Iron Fe	mg/L	0.13	0.13	0.13	0.13	0.14	0.15	0.14	0.14	0.13	0.13	0.13	0.13
Lead Pb	mg/L	0.00008	0.00008	0.00008	0.00008	0.00008	0.00008	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007
Lithium Li	mg/L	0.0032	0.0032	0.0032	0.0034	0.0035	0.0037	0.0036	0.0033	0.0033	0.0032	0.0032	0.0032
Magnesium Mg	mg/L	4.5	4.4	4.4	4.6	4.8	5.1	4.9	4.6	4.5	4.5	4.4	4.4
Manganese Mn	mg/L	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Mercury Hg	mg/L	0.0000087	0.0000086	0.0000086	0.0000092	0.0000096	0.0000103	0.0000098	0.0000092	0.0000090	0.0000089	0.0000089	0.0000088
Molybdenum Mo	mg/L	0.00058	0.00057	0.00057	0.00049	0.00047	0.00049	0.00045	0.00042	0.00041	0.00041	0.00041	0.00041
Nickel Ni	mg/L	0.0008	0.0008	0.0008	0.0008	0.0007	0.0008	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007
Phosphorus P	mg/L	0.022	0.021	0.021	0.018	0.016	0.017	0.015	0.014	0.014	0.014	0.014	0.014
Potassium K	mg/L	3.8	3.8	3.8	3.5	3.5	3.7	3.4	3.2	3.1	3.1	3.1	3.1
Selenium Se	mg/L	0.00066	0.00066	0.00066	0.00070	0.00074	0.00079	0.00075	0.00070	0.00069	0.00068	0.00068	0.00067
Silicon SiO2	mg/L	0.99	0.99	0.98	1.00	1.02	1.09	1.04	0.97	0.95	0.94	0.94	0.93
Silver Ag	mg/L	0.0000600	0.0000597	0.0000594	0.0000660	0.0000696	0.0000717	0.0000648	0.0000599	0.0000585	0.0000581	0.0000578	0.0000576
Sodium Na	mg/L	56	55	55	51	50	53	50	46	45	45	45	45
Strontium Sr	mg/L	0.026	0.025	0.025	0.025	0.027	0.028	0.027	0.026	0.025	0.025	0.025	0.025
Tellurium Te	mg/L	0.032	0.032	0.032	0.034	0.035	0.038	0.036	0.034	0.033	0.033	0.033	0.032
Thallium Tl	mg/L	0.000022	0.000022	0.000022	0.000023	0.000024	0.000025	0.000024	0.000022	0.000022	0.000022	0.000022	0.000022
Thorium Th	mg/L	0.000035	0.000035	0.000035	0.000035	0.000036	0.000039	0.000037	0.000035	0.000034	0.000034	0.000033	0.000033
Tin Sn	mg/L	0.00030	0.00030	0.00030	0.00025	0.00026	0.00027	0.00026	0.00024	0.00024	0.00024	0.00023	0.00023
Titanium Ti	mg/L	0.0094	0.0094	0.0093	0.0101	0.0105	0.0113	0.0108	0.0101	0.0099	0.0098	0.0098	0.0097
Uranium U	mg/L	0.000050	0.000050	0.000050	0.000054	0.000056	0.000059	0.000054	0.000050	0.000049	0.000049	0.000049	0.000048
Vanadium V	mg/L	0.0013	0.0013	0.0013	0.0013	0.0014	0.0014	0.0014	0.0013	0.0012	0.0012	0.0012	0.0012
Zinc Zn	mg/L	0.0029	0.0029	0.0029	0.0025	0.0024	0.0026	0.0027	0.0026	0.0025	0.0025	0.0025	0.0025
Zirconium Zr	mg/L	0.0033	0.0033	0.0033	0.0035	0.0036	0.0039	0.0037	0.0035	0.0034	0.0034	0.0034	0.0034

Table H-3-A-2
Scenario 3

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE										
Date		Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16
Parameter												
TDS	mg/L	133	133	132	121	120	108	110	103	104	103	102
TSS	mg/L	3.1	3.1	3.1	3.3	3.5	3.2	3.3	3.1	3.1	3.1	3.1
Free CN	mg/L											
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L											
CNO	mg/L											
SCN	mg/L	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001
Sulphate	mg/L	3.9	3.9	3.9	3.3	3.2	2.9	2.9	2.7	2.7	2.7	2.7
Chloride	mg/L	94	93	93	86	86	77	79	74	74	74	73
Total Ammonia	mg/L	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.000	0.000	0.000	0.000
Nitrate	mg/L				0.00	0.00	0.00	0.00	0.00			
Nitrite	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alkalinity	mg/L	18	18	18	19	20	18	19	17	18	17	17
OrthoPhosphate-P	mg/L	0.0074	0.0073	0.0073	0.0059	0.0054	0.0048	0.0048	0.0044	0.0045	0.0044	0.0044
Phosphate-P	mg/L	0.0180	0.0179	0.0178	0.0176	0.0174	0.0157	0.0159	0.0149	0.0150	0.0149	0.0148
Org. Carbon	mg/L	4.0	3.9	3.9	4.2	4.4	4.0	4.1	3.9	3.9	3.9	3.8
Hardness CaCO3	mg/L	26	26	26	26	27	25	26	24	25	24	24
Total Metals												
Aluminum Al	mg/L	0.12	0.12	0.11	0.12	0.13	0.12	0.12	0.11	0.11	0.11	0.11
Antimony Sb	mg/L	0.0008	0.0008	0.0008	0.0006	0.0006	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Arsenic As	mg/L	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
Barium Ba	mg/L	0.0015	0.0015	0.0015	0.0014	0.0015	0.0014	0.0014	0.0013	0.0014	0.0013	0.0013
Beryllium Be	mg/L	0.00012	0.00012	0.00012	0.00013	0.00014	0.00012	0.00012	0.00011	0.00011	0.00011	0.00011
Bismuth Bi	mg/L	0.00056	0.00056	0.00056	0.00042	0.00038	0.00033	0.00033	0.00030	0.00031	0.00030	0.00030
Boron B	mg/L	0.022	0.022	0.022	0.023	0.024	0.022	0.023	0.022	0.022	0.022	0.021
Cadmium Cd	mg/L	0.0000083	0.0000082	0.0000082	0.0000079	0.0000079	0.0000071	0.0000073	0.0000068	0.0000069	0.0000068	0.0000068
Calcium Ca	mg/L	13	13	13	11	11	9	10	9	9	9	9
Chromium Cr	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Cobalt Co	mg/L	0.0004	0.0004	0.0004	0.0003	0.0003	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002
Copper Cu	mg/L	0.0011	0.0011	0.0011	0.0011	0.0011	0.0010	0.0011	0.0010	0.0010	0.0010	0.0010
Iron Fe	mg/L	0.13	0.13	0.13	0.14	0.14	0.13	0.14	0.13	0.13	0.13	0.13
Lead Pb	mg/L	0.00007	0.00007	0.00007	0.00007	0.00007	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006
Lithium Li	mg/L	0.0032	0.0032	0.0032	0.0034	0.0035	0.0032	0.0033	0.0031	0.0031	0.0031	0.0031
Magnesium Mg	mg/L	4.4	4.4	4.3	4.5	4.7	4.3	4.5	4.2	4.3	4.2	4.2
Manganese Mn	mg/L	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003
Mercury Hg	mg/L	0.0000088	0.0000088	0.0000087	0.0000093	0.0000097	0.0000088	0.0000091	0.0000086	0.0000087	0.0000086	0.0000086
Molybdenum Mo	mg/L	0.00040	0.00040	0.00040	0.00036	0.00036	0.00032	0.00032	0.00030	0.00030	0.00030	0.00030
Nickel Ni	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0005	0.0005	0.0005	0.0005
Phosphorus P	mg/L	0.014	0.014	0.014	0.012	0.011	0.010	0.010	0.009	0.009	0.009	0.009
Potassium K	mg/L	3.1	3.1	3.0	2.9	3.0	2.7	2.8	2.6	2.6	2.6	2.6
Selenium Se	mg/L	0.00067	0.00067	0.00067	0.00071	0.00074	0.00068	0.00070	0.00066	0.00066	0.00066	0.00065
Silicon SiO2	mg/L	0.93	0.92	0.92	0.95	0.98	0.89	0.92	0.87	0.87	0.87	0.86
Silver Ag	mg/L	0.0000574	0.0000571	0.0000568	0.0000642	0.0000681	0.0000597	0.0000585	0.0000544	0.0000547	0.0000544	0.0000541
Sodium Na	mg/L	44	44	44	42	43	39	40	37	37	37	37
Strontium Sr	mg/L	0.024	0.024	0.024	0.025	0.026	0.024	0.025	0.023	0.023	0.023	0.023
Tellurium Te	mg/L	0.032	0.032	0.032	0.034	0.036	0.033	0.034	0.032	0.032	0.032	0.031
Thallium Tl	mg/L	0.000021	0.000021	0.000021	0.000022	0.000023	0.000021	0.000022	0.000020	0.000021	0.000020	0.000020
Thorium Th	mg/L	0.000033	0.000033	0.000033	0.000034	0.000035	0.000032	0.000033	0.000031	0.000031	0.000031	0.000031
Tin Sn	mg/L	0.00023	0.00023	0.00023	0.00020	0.00021	0.00019	0.00020	0.00019	0.00019	0.00019	0.00019
Titanium Ti	mg/L	0.0097	0.0096	0.0096	0.0103	0.0107	0.0098	0.0101	0.0095	0.0096	0.0095	0.0095
Uranium U	mg/L	0.000048	0.000048	0.000048	0.000052	0.000055	0.000049	0.000049	0.000046	0.000046	0.000046	0.000045
Vanadium V	mg/L	0.0012	0.0012	0.0012	0.0013	0.0013	0.0012	0.0012	0.0011	0.0012	0.0011	0.0011
Zinc Zn	mg/L	0.0025	0.0025	0.0025	0.0022	0.0021	0.0020	0.0023	0.0022	0.0022	0.0022	0.0022
Zirconium Zr	mg/L	0.0033	0.0033	0.0033	0.0035	0.0036	0.0033	0.0034	0.0032	0.0033	0.0032	0.0032

Table H 3-A-3
Scenario 3

Loadings to Tail Lake (kg/month)												
Date	Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter												
TDS	81148	78530	81148	117442	101234	86389	86424	83234	78530	81148	81148	73295
TSS	183	177	183	1239	685	341	375	235	177	183	183	166
Free CN	1.10	1.06	1.10	1.06	1.10	1.10	1.06	1.10	1.06	1.10	1.10	0.99
Total CN	11	10	11	11	11	11	10	11	10	11	11	10
WAD CN	1.47	1.42	1.47	1.42	1.47	1.47	1.42	1.47	1.42	1.47	1.47	1.32
CNO	1210	1171	1210	1171	1210	1210	1171	1210	1171	1210	1210	1093
SCN	16	16	16	16	16	16	16	16	16	16	16	15
Sulphate	14302	13840	14302	18322	17074	15398	15298	14794	13840	14302	14302	12918
Chloride	49110	47526	49110	82360	71048	57314	58180	52622	47526	49110	49110	44357
Total Ammonia	149	145	149	288	238	187	194	166	145	149	149	135
Nitrate	758	733	758	1855	1453	1051	1108	888	733	758	758	684
Nitrite	116	112	116	139	132	123	121	119	112	116	116	105
Alkalinity	6928	6704	6928	15548	12117	8343	8349	7362	6704	6928	6928	6257
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	24	22	22	21	21	21	21	21	19
Org. Carbon				2122.46	1171.73	314.49	328.91	86.92				
Hardness CaCO3	14992	14508	14992	26182	22190	16931	17008	15652	14508	14992	14992	13541
Total Metals												
Aluminum Al	4.47	4.33	4.47	19.31	12.08	9.26	8.84	5.92	4.33	4.47	4.47	4.04
Antimony Sb	1.32	1.28	1.32	4.67	3.44	2.22	2.44	1.72	1.28	1.32	1.32	1.19
Arsenic As	0.39	0.38	0.39	0.69	0.59	0.47	0.48	0.43	0.38	0.39	0.39	0.36
Barium Ba	1.56	1.51	1.56	2.29	2.00	1.76	1.73	1.63	1.51	1.56	1.56	1.41
Beryllium Be	0.05	0.05	0.05	0.23	0.15	0.08	0.09	0.06	0.05	0.05	0.05	0.04
Bismuth Bi	1.23	1.19	1.23	4.55	3.31	2.10	2.31	1.62	1.19	1.23	1.23	1.11
Boron B	2.80	2.71	2.80	10.30	7.39	4.51	4.73	3.43	2.71	2.80	2.80	2.53
Cadmium Cd	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Calcium Ca	40484	39178	40484	42156	42169	41159	39995	40733	39178	40484	40484	36566
Chromium Cr	1.02	0.99	1.02	1.32	1.27	1.12	1.06	1.04	0.99	1.02	1.02	0.92
Cobalt Co	1.67	1.62	1.67	1.85	1.81	1.73	1.69	1.70	1.62	1.67	1.67	1.51
Copper Cu	1.46	1.41	1.46	1.84	1.69	1.52	1.49	1.48	1.41	1.46	1.46	1.32
Iron Fe	4.63	4.48	4.63	21.53	11.68	9.32	9.43	6.00	4.48	4.63	4.63	4.18
Lead Pb	0.05	0.05	0.05	0.13	0.10	0.07	0.07	0.06	0.05	0.05	0.05	0.04
Lithium Li	0.46	0.45	0.46	1.84	1.15	0.69	0.74	0.55	0.45	0.46	0.46	0.42
Magnesium Mg	1082	1047	1082	2866	2088	1461	1468	1204	1047	1082	1082	977
Manganese Mn	4.56	4.41	4.56	5.17	4.97	4.80	4.75	4.66	4.41	4.56	4.56	4.12
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	1.48	1.43	1.48	1.50	1.52	1.49	1.45	1.48	1.43	1.48	1.48	1.34
Nickel Ni	1.26	1.22	1.26	1.77	1.58	1.38	1.37	1.31	1.22	1.26	1.26	1.14
Phosphorus P	33	32	33	45	40	36	36	35	32	33	33	30
Potassium K	6696	6480	6696	7119	7036	6794	6630	6738	6480	6696	6696	6048
Selenium Se	0.04	0.04	0.04	0.21	0.12	0.06	0.07	0.05	0.04	0.04	0.04	0.03
Silicon SiO2	556	538	556	963	773	631	633	584	538	556	556	502
Silver Ag	0.01	0.01	0.01	0.06	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sodium Na	6353	6148	6353	11746	9527	7313	7360	6675	6148	6353	6353	5739
Strontium Sr	12	12	12	21	18	14	14	13	12	12	12	11
Tellurium Te	0.02	0.02	0.02	17.74	8.41	2.65	3.32	0.89	0.02	0.02	0.02	0.02
Thallium Tl	0.00	0.00	0.00	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.02	0.01	0.00	0.01	0.00				
Tin Sn	0.18	0.18	0.18	0.74	0.56	0.34	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.10	0.09	0.10	2.42	1.22	0.46	0.56	0.22	0.09	0.10	0.10	0.09
Uranium U	0.00	0.00	0.00	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.36	0.35	0.36	1.09	0.79	0.52	0.54	0.43	0.35	0.36	0.36	0.33
Zinc Zn	3.5	3.4	3.5	4.4	4.1	3.8	4.2	3.7	3.4	3.5	3.5	3.2
Zirconium Zr				2.10	1.04	0.35	0.44	0.13				

Table H 3-A-3
Scenario 3

Loadings to Tail Lake (kg/month)												
Date	Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter												
TDS	81148	78530	81148	117011	101009	86327	86328	83208	78530	81148	81148	73295
TSS	183	177	183	1227	680	339	372	235	177	183	183	166
Free CN	1.10	1.06	1.10	1.06	1.10	1.10	1.06	1.10	1.06	1.10	1.10	0.99
Total CN	11	10	11	11	11	11	10	11	10	11	11	10
WAD CN	1.47	1.42	1.47	1.42	1.47	1.47	1.42	1.47	1.42	1.47	1.47	1.32
CNO	1210	1171	1210	1171	1210	1210	1171	1210	1171	1210	1210	1093
SCN	16	16	16	16	16	16	16	16	16	16	16	15
Sulphate	14302	13840	14302	18314	17069	15397	15295	14793	13840	14302	14302	12918
Chloride	49110	47526	49110	82247	70972	57293	58150	52614	47526	49110	49110	44357
Total Ammonia	149	145	149	288	238	187	194	166	145	149	149	135
Nitrate	758	733	758	1855	1453	1051	1108	888	733	758	758	684
Nitrite	116	112	116	139	132	123	121	119	112	116	116	105
Alkalinity	6928	6704	6928	15450	12059	8326	8329	7357	6704	6928	6928	6257
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	24	22	22	21	21	21	21	21	19
Org. Carbon				2098.99	1158.56	310.77	324.90	85.83				
Hardness CaCO3	14992	14508	14992	26053	22109	16908	16978	15644	14508	14992	14992	13541
Total Metals												
Aluminum Al	4.47	4.33	4.47	19.24	12.06	9.23	8.82	5.92	4.33	4.47	4.47	4.04
Antimony Sb	1.32	1.28	1.32	4.67	3.44	2.22	2.44	1.72	1.28	1.32	1.32	1.19
Arsenic As	0.39	0.38	0.39	0.69	0.59	0.47	0.48	0.43	0.38	0.39	0.39	0.36
Barium Ba	1.56	1.51	1.56	2.28	2.00	1.75	1.73	1.62	1.51	1.56	1.56	1.41
Beryllium Be	0.05	0.05	0.05	0.23	0.15	0.08	0.09	0.06	0.05	0.05	0.05	0.04
Bismuth Bi	1.23	1.19	1.23	4.55	3.31	2.10	2.31	1.62	1.19	1.23	1.23	1.11
Boron B	2.80	2.71	2.80	10.26	7.36	4.50	4.72	3.43	2.71	2.80	2.80	2.53
Cadmium Cd	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Calcium Ca	40484	39178	40484	42136	42158	41155	39990	40731	39178	40484	40484	36566
Chromium Cr	1.02	0.99	1.02	1.31	1.26	1.12	1.06	1.04	0.99	1.02	1.02	0.92
Cobalt Co	1.67	1.62	1.67	1.85	1.81	1.73	1.69	1.70	1.62	1.67	1.67	1.51
Copper Cu	1.46	1.41	1.46	1.84	1.69	1.52	1.49	1.48	1.41	1.46	1.46	1.32
Iron Fe	4.63	4.48	4.63	21.36	11.62	9.28	9.38	5.99	4.48	4.63	4.63	4.18
Lead Pb	0.05	0.05	0.05	0.13	0.10	0.07	0.07	0.06	0.05	0.05	0.05	0.04
Lithium Li	0.46	0.45	0.46	1.83	1.14	0.69	0.73	0.54	0.45	0.46	0.46	0.42
Magnesium Mg	1082	1047	1082	2850	2079	1458	1464	1203	1047	1082	1082	977
Manganese Mn	4.56	4.41	4.56	5.17	4.97	4.80	4.75	4.66	4.41	4.56	4.56	4.12
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	1.48	1.43	1.48	1.50	1.52	1.49	1.45	1.48	1.43	1.48	1.48	1.34
Nickel Ni	1.26	1.22	1.26	1.77	1.58	1.38	1.37	1.31	1.22	1.26	1.26	1.14
Phosphorus P	33	32	33	45	40	36	36	35	32	33	33	30
Potassium K	6696	6480	6696	7113	7032	6793	6629	6738	6480	6696	6696	6048
Selenium Se	0.04	0.04	0.04	0.21	0.12	0.06	0.07	0.05	0.04	0.04	0.04	0.03
Silicon SiO2	556	538	556	960	771	630	632	584	538	556	556	502
Silver Ag	0.01	0.01	0.01	0.06	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sodium Na	6353	6148	6353	11684	9492	7302	7346	6671	6148	6353	6353	5739
Strontium Sr	12	12	12	21	18	14	14	13	12	12	12	11
Tellurium Te	0.02	0.02	0.02	17.54	8.31	2.62	3.28	0.88	0.02	0.02	0.02	0.02
Thallium Tl	0.00	0.00	0.00	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.02	0.01	0.00	0.01	0.00				
Tin Sn	0.18	0.18	0.18	0.74	0.56	0.34	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.10	0.09	0.10	2.39	1.21	0.46	0.55	0.22	0.09	0.10	0.10	0.09
Uranium U	0.00	0.00	0.00	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.36	0.35	0.36	1.09	0.79	0.52	0.54	0.43	0.35	0.36	0.36	0.33
Zinc Zn	3.5	3.4	3.5	4.4	4.1	3.8	4.2	3.7	3.4	3.5	3.5	3.2
Zirconium Zr				2.08	1.03	0.35	0.44	0.12				

Table H 3-A-3
Scenario 3

Loadings to Tail Lake (kg/month)												
Date	Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter												
TDS	50662	49028	50662	87387	70473	55832	56817	52721	49028	50662	50662	45759
TSS				1046	495	155	195	51				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate	1289	1247	1289	5619	3993	2358	2669	1769	1247	1289	1289	1164
Chloride	49110	47526	49110	82214	70956	57290	58148	52614	47526	49110	49110	44357
Total Ammonia	25	24	25	153	104	58	68	40	24	25	25	22
Nitrate	29	28	29	1036	654	292	365	147	28	29	29	26
Nitrite	64	62	64	86	79	71	70	67	62	64	64	58
Alkalinity				8718	5118	1396	1623	429				
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	24	22	22	21	21	21	21	21	19
Org. Carbon				2092.35	1155.64	310.19	324.55	85.81				
Hardness CaCO3				11508	7099	1913	2467	652				
Total Metals												
Aluminum Al	0.81	0.78	0.81	12.73	6.56	4.79	4.29	1.91	0.78	0.81	0.81	0.73
Antimony Sb	1.21	1.17	1.21	4.55	3.32	2.11	2.33	1.61	1.17	1.21	1.21	1.09
Arsenic As	0.03	0.03	0.03	0.27	0.18	0.09	0.10	0.05	0.03	0.03	0.03	0.02
Barium Ba	0.06	0.06	0.06	0.82	0.49	0.25	0.27	0.12	0.06	0.06	0.06	0.05
Beryllium Be	0.03	0.03	0.03	0.20	0.13	0.06	0.06	0.04	0.03	0.03	0.03	0.03
Bismuth Bi	1.21	1.17	1.21	4.52	3.28	2.08	2.29	1.60	1.17	1.21	1.21	1.09
Boron B	0.60	0.58	0.60	7.43	4.73	2.12	2.36	1.15	0.58	0.60	0.60	0.55
Cadmium Cd	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Calcium Ca	263	254	263	3033	1827	888	1007	489	254	263	263	237
Chromium Cr	0.07	0.06	0.07	0.38	0.30	0.16	0.13	0.09	0.06	0.07	0.07	0.06
Cobalt Co	0.06	0.06	0.06	0.28	0.19	0.11	0.13	0.08	0.06	0.06	0.06	0.05
Copper Cu	0.03	0.03	0.03	0.43	0.25	0.09	0.10	0.05	0.03	0.03	0.03	0.03
Iron Fe	0.23	0.23	0.23	16.37	6.78	4.69	4.89	1.51	0.23	0.23	0.23	0.21
Lead Pb	0.01	0.01	0.01	0.08	0.05	0.03	0.03	0.02	0.01	0.01	0.01	0.01
Lithium Li	0.06	0.06	0.06	1.42	0.73	0.28	0.34	0.14	0.06	0.06	0.06	0.05
Magnesium Mg	121	117	121	1899	1106	493	529	240	117	121	121	110
Manganese Mn	0.16	0.15	0.16	0.89	0.56	0.40	0.49	0.26	0.15	0.16	0.16	0.14
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	0.01	0.01	0.01	0.08	0.05	0.02	0.03	0.02	0.01	0.01	0.01	0.01
Nickel Ni	0.12	0.12	0.12	0.65	0.43	0.24	0.26	0.17	0.12	0.12	0.12	0.11
Phosphorus P	23	22	23	33	29	25	25	24	22	23	23	21
Potassium K	25	24	25	651	358	120	171	66	24	25	25	23
Selenium Se	0.00	0.00	0.00	0.16	0.08	0.02	0.03	0.01	0.00	0.00	0.00	0.00
Silicon SiO2	10	9	10	397	204	76	93	34	9	10	10	9
Silver Ag	0.00	0.00	0.00	0.05	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Sodium Na	12	12	12	5526	3140	958	1206	329	12	12	12	11
Strontium Sr	0	0	0	9	5	2	3	1	0	0	0	0
Tellurium Te				17.46	8.27	2.59	3.25	0.86				
Thallium Tl	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn	0.18	0.18	0.18	0.73	0.55	0.33	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.06	0.06	0.06	2.34	1.17	0.42	0.51	0.19	0.06	0.06	0.06	0.05
Uranium U	0.00	0.00	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.18	0.18	0.18	0.88	0.59	0.33	0.36	0.24	0.18	0.18	0.18	0.16
Zinc Zn	0.2	0.2	0.2	1.2	0.8	0.5	1.0	0.4	0.2	0.2	0.2	0.2
Zirconium Zr				1.94	0.95	0.31	0.39	0.11				

Table H 3-A-3
Scenario 3

Loadings to Tail Lake (kg/month)												
Date	Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter												
TDS				417065	398294	383460	386128	380307				
TSS				1718	814	255	321	85				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				843	516	146	241	68				
Chloride				258472	245537	234827	236164	231920				
Total Ammonia				61	38	16	22	7				
Nitrate				470	291	123	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				8830	5188	1417	1649	436				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				7	3	1	1	0				
Org. Carbon				2119.25	1171.42	314.86	329.81	87.29				
Hardness CaCO3				11656	7196	1942	2507	663				
Total Metals												
Aluminum Al				67.17	31.63	11.99	13.55	3.71				
Antimony Sb				0.08	0.06	0.04	0.05	0.01				
Arsenic As				0.26	0.15	0.05	0.06	0.02				
Barium Ba				0.60	0.33	0.15	0.16	0.04				
Beryllium Be				0.09	0.05	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				12.35	6.50	2.15	2.57	0.71				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				24897	23661	22797	22895	22446				
Chromium Cr				0.26	0.19	0.07	0.03	0.01				
Cobalt Co				0.08	0.04	0.01	0.02	0.01				
Copper Cu				0.52	0.27	0.07	0.09	0.02				
Iron Fe				71.30	32.59	12.63	14.92	3.98				
Lead Pb				0.05	0.03	0.01	0.01	0.00				
Lithium Li				1.74	0.83	0.26	0.33	0.09				
Magnesium Mg				2224	1148	401	446	119				
Manganese Mn				1.63	0.76	0.32	0.44	0.12				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.11	0.05	0.01	0.02	0.00				
Nickel Ni				0.26	0.13	0.04	0.04	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				1159	575	167	236	63				
Selenium Se				0.39	0.19	0.06	0.07	0.02				
Silicon SiO2				504	246	80	101	28				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				141685	133712	128070	128725	126387				
Strontium Sr				12	6	2	3	1				
Tellurium Te				17.68	8.38	2.63	3.31	0.88				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.03	0.01	0.01	0.01	0.00				
Tin Sn				0.06	0.07	0.02	0.03	0.01				
Titanium Ti				5.38	2.55	0.80	1.01	0.27				
Uranium U				0.04	0.02	0.00	0.01	0.00				
Vanadium V				0.69	0.33	0.09	0.10	0.03				
Zinc Zn				0.7	0.3	0.2	0.6	0.2				
Zirconium Zr				1.98	0.97	0.32	0.40	0.11				

Table H 3-A-3
Scenario 3

Loadings to Tail Lake (kg/month)												
Date	Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter												
TDS				39489	20419	5256	7929	2081				
TSS				1746	828	256	321	84				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				854	523	146	241	68				
Chloride				28539	15399	4442	5782	1517				
Total Ammonia				61	38	16	22	7				
Nitrate				470	291	123	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				8975	5275	1419	1652	434				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				8	3	1	1	0				
Org. Carbon				2153.97	1191.12	315.39	330.38	86.71				
Hardness CaCO3				11847	7317	1945	2511	659				
Total Metals												
Aluminum Al				68.20	32.12	12.01	13.57	3.68				
Antimony Sb				0.08	0.06	0.04	0.05	0.01				
Arsenic As				0.27	0.15	0.05	0.06	0.02				
Barium Ba				0.61	0.34	0.15	0.16	0.04				
Beryllium Be				0.09	0.05	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				12.54	6.60	2.15	2.57	0.70				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				2661	1407	523	621	170				
Chromium Cr				0.27	0.19	0.07	0.03	0.01				
Cobalt Co				0.08	0.04	0.01	0.02	0.01				
Copper Cu				0.53	0.27	0.07	0.09	0.02				
Iron Fe				72.45	33.13	12.65	14.95	3.95				
Lead Pb				0.05	0.03	0.01	0.01	0.00				
Lithium Li				1.76	0.84	0.26	0.33	0.09				
Magnesium Mg				2260	1167	402	447	118				
Manganese Mn				1.66	0.77	0.32	0.44	0.12				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.11	0.05	0.01	0.02	0.00				
Nickel Ni				0.27	0.13	0.04	0.04	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				1178	585	167	237	62				
Selenium Se				0.40	0.19	0.06	0.07	0.02				
Silicon SiO2				512	250	80	101	28				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				16405	8304	2529	3186	836				
Strontium Sr				12	6	2	3	1				
Tellurium Te				17.97	8.52	2.63	3.31	0.87				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.03	0.01	0.01	0.01	0.00				
Tin Sn				0.06	0.07	0.02	0.03	0.01				
Titanium Ti				5.46	2.59	0.80	1.01	0.27				
Uranium U				0.04	0.02	0.00	0.01	0.00				
Vanadium V				0.70	0.33	0.09	0.10	0.03				
Zinc Zn				0.7	0.3	0.2	0.6	0.2				
Zirconium Zr				2.01	0.98	0.32	0.40	0.11				

Table H 3-A-3
Scenario 3

Loadings to Tail Lake (kg/month)												
Date	Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter												
TDS				39345	20343	5320	7972	2092				
TSS				1739	824	259	323	85				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				852	522	147	242	68				
Chloride				28435	15342	4496	5813	1525				
Total Ammonia				61	38	16	22	7				
Nitrate				470	291	123	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				8942	5255	1437	1661	436				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				8	3	1	1	0				
Org. Carbon				2146.11	1186.67	319.23	332.17	87.16				
Hardness CaCO3				11804	7290	1969	2525	662				
Total Metals												
Aluminum Al				67.96	32.01	12.15	13.63	3.70				
Antimony Sb				0.08	0.06	0.04	0.05	0.01				
Arsenic As				0.27	0.15	0.05	0.06	0.02				
Barium Ba				0.61	0.34	0.15	0.16	0.04				
Beryllium Be				0.09	0.05	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				12.50	6.58	2.17	2.58	0.71				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				2652	1402	529	624	171				
Chromium Cr				0.27	0.19	0.07	0.04	0.01				
Cobalt Co				0.08	0.04	0.01	0.02	0.01				
Copper Cu				0.53	0.27	0.07	0.09	0.02				
Iron Fe				72.19	33.00	12.80	15.03	3.97				
Lead Pb				0.05	0.03	0.01	0.01	0.00				
Lithium Li				1.76	0.84	0.26	0.33	0.09				
Magnesium Mg				2251	1162	406	449	119				
Manganese Mn				1.65	0.77	0.33	0.44	0.12				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.11	0.05	0.01	0.02	0.00				
Nickel Ni				0.27	0.13	0.04	0.04	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				1173	582	169	238	63				
Selenium Se				0.40	0.19	0.06	0.07	0.02				
Silicon SiO2				510	249	81	102	28				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				16345	8273	2560	3203	841				
Strontium Sr				12	6	2	3	1				
Tellurium Te				17.91	8.49	2.67	3.33	0.87				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.03	0.01	0.01	0.01	0.00				
Tin Sn				0.06	0.07	0.02	0.03	0.01				
Titanium Ti				5.44	2.58	0.81	1.01	0.27				
Uranium U				0.04	0.02	0.00	0.01	0.00				
Vanadium V				0.69	0.33	0.09	0.10	0.03				
Zinc Zn				0.7	0.3	0.2	0.6	0.2				
Zirconium Zr				2.00	0.98	0.32	0.40	0.11				

Table H 3-A-3
Scenario 3

Loadings to Tail Lake (kg/month)												
Date	Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter												
TDS				39433	20389	5249	7918	2096				
TSS				1743	826	255	321	85				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				706	432	108	192	51				
Chloride				28499	15377	4436	5773	1528				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				8962	5267	1417	1650	437				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				8	3	1	1	0				
Org. Carbon				2150.88	1189.37	314.97	329.92	87.32				
Hardness CaCO3				11830	7306	1942	2507	664				
Total Metals												
Aluminum Al				63.82	29.42	10.88	12.12	3.21				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.17	0.09	0.03	0.03	0.01				
Barium Ba				0.60	0.33	0.14	0.15	0.04				
Beryllium Be				0.07	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.01	0.00	0.00	0.00				
Boron B				11.52	5.97	1.89	2.23	0.59				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				2406	1249	457	536	142				
Chromium Cr				0.25	0.18	0.06	0.03	0.01				
Cobalt Co				0.06	0.03	0.01	0.01	0.00				
Copper Cu				0.51	0.26	0.06	0.08	0.02				
Iron Fe				71.35	32.46	12.37	14.59	3.86				
Lead Pb				0.03	0.01	0.01	0.00	0.00				
Lithium Li				1.74	0.83	0.25	0.32	0.08				
Magnesium Mg				2231	1149	394	438	116				
Manganese Mn				1.63	0.76	0.32	0.43	0.11				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.11	0.05	0.01	0.02	0.00				
Nickel Ni				0.25	0.12	0.03	0.04	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				1169	580	165	234	62				
Selenium Se				0.38	0.18	0.05	0.06	0.02				
Silicon SiO2				464	220	68	85	23				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				16375	8288	2524	3179	841				
Strontium Sr				12	6	2	3	1				
Tellurium Te				17.93	8.50	2.63	3.30	0.87				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.02	0.01	0.00	0.00	0.00				
Tin Sn				0.04	0.06	0.02	0.02	0.01				
Titanium Ti				5.44	2.58	0.80	1.00	0.26				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.66	0.31	0.08	0.09	0.02				
Zinc Zn				0.6	0.3	0.2	0.6	0.2				
Zirconium Zr				1.81	0.86	0.26	0.33	0.09				

Table H 3-A-3
Scenario 3

Loadings to Tail Lake (kg/month)												
Date	Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter												
TDS				39503	20426	5258	7932	2082				
TSS				1746	828	256	321	84				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				707	432	108	192	50				
Chloride				28549	15405	4443	5784	1518				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				8978	5277	1420	1652	434				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				8	3	1	1	0				
Org. Carbon				2154.72	1191.54	315.49	330.49	86.74				
Hardness CaCO3				11851	7319	1946	2512	659				
Total Metals												
Aluminum Al				63.93	29.47	10.90	12.14	3.19				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.17	0.09	0.03	0.03	0.01				
Barium Ba				0.60	0.33	0.14	0.15	0.04				
Beryllium Be				0.07	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.01	0.00	0.00	0.00				
Boron B				11.54	5.98	1.89	2.24	0.59				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				2410	1251	458	537	141				
Chromium Cr				0.25	0.18	0.06	0.03	0.01				
Cobalt Co				0.06	0.03	0.01	0.01	0.00				
Copper Cu				0.51	0.26	0.07	0.08	0.02				
Iron Fe				71.48	32.52	12.39	14.62	3.84				
Lead Pb				0.03	0.01	0.01	0.00	0.00				
Lithium Li				1.74	0.83	0.26	0.32	0.08				
Magnesium Mg				2235	1151	395	438	115				
Manganese Mn				1.63	0.76	0.32	0.43	0.11				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.11	0.05	0.01	0.02	0.00				
Nickel Ni				0.25	0.12	0.03	0.04	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				1172	581	165	235	62				
Selenium Se				0.38	0.18	0.05	0.06	0.02				
Silicon SiO2				465	220	68	86	22				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				16404	8303	2528	3185	836				
Strontium Sr				12	6	2	3	1				
Tellurium Te				17.96	8.51	2.63	3.31	0.87				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.02	0.01	0.00	0.00	0.00				
Tin Sn				0.04	0.06	0.02	0.02	0.01				
Titanium Ti				5.45	2.58	0.80	1.00	0.26				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.66	0.31	0.08	0.09	0.02				
Zinc Zn				0.6	0.3	0.2	0.6	0.2				
Zirconium Zr				1.81	0.86	0.27	0.33	0.09				

Table H 3-A-3
Scenario 3

Loadings to Tail Lake (kg/month)												
Date	Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter												
TDS				39358	20350	5322	7975	2093				
TSS				1740	825	259	323	85				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				705	431	109	193	51				
Chloride				28444	15347	4497	5815	1526				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				8945	5257	1437	1661	436				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				8	3	1	1	0				
Org. Carbon				2146.79	1187.06	319.34	332.29	87.19				
Hardness CaCO3				11807	7292	1969	2525	663				
Total Metals												
Aluminum Al				63.70	29.36	11.03	12.20	3.20				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.17	0.09	0.03	0.03	0.01				
Barium Ba				0.59	0.33	0.15	0.15	0.04				
Beryllium Be				0.07	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.01	0.00	0.00	0.00				
Boron B				11.50	5.96	1.91	2.25	0.59				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				2402	1247	463	540	142				
Chromium Cr				0.25	0.18	0.06	0.03	0.01				
Cobalt Co				0.06	0.03	0.01	0.01	0.00				
Copper Cu				0.50	0.26	0.07	0.08	0.02				
Iron Fe				71.21	32.39	12.54	14.70	3.86				
Lead Pb				0.03	0.01	0.01	0.00	0.00				
Lithium Li				1.74	0.82	0.26	0.32	0.08				
Magnesium Mg				2227	1147	400	441	116				
Manganese Mn				1.63	0.75	0.32	0.43	0.11				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.11	0.05	0.01	0.02	0.00				
Nickel Ni				0.24	0.12	0.03	0.04	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				1167	579	167	236	62				
Selenium Se				0.38	0.18	0.05	0.06	0.02				
Silicon SiO2				463	219	69	86	23				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				16344	8272	2559	3202	840				
Strontium Sr				12	6	2	3	1				
Tellurium Te				17.89	8.48	2.66	3.32	0.87				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.02	0.01	0.00	0.00	0.00				
Tin Sn				0.04	0.06	0.02	0.02	0.01				
Titanium Ti				5.43	2.57	0.81	1.01	0.26				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.65	0.31	0.08	0.09	0.02				
Zinc Zn				0.6	0.3	0.2	0.6	0.2				
Zirconium Zr				1.81	0.86	0.27	0.34	0.09				

Table H 3-A-3
Scenario 3

Loadings to Tail Lake (kg/month)												
Date	Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16	Year 10 Jan-17
Parameter												
TDS				39445	20396	5251	7920	2079				
TSS				1744	827	255	321	84				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				706	432	108	192	50				
Chloride				28508	15382	4437	5775	1516				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				8965	5269	1418	1650	433				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				8	3	1	1	0				
Org. Carbon				2151.56	1189.76	315.06	330.02	86.62				
Hardness CaCO3				11834	7309	1943	2508	658				
Total Metals												
Aluminum Al				63.84	29.43	10.88	12.12	3.18				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.17	0.09	0.03	0.03	0.01				
Barium Ba				0.60	0.33	0.14	0.15	0.04				
Beryllium Be				0.07	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.01	0.00	0.00	0.00				
Boron B				11.53	5.97	1.89	2.23	0.59				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				2407	1250	457	536	141				
Chromium Cr				0.25	0.18	0.06	0.03	0.01				
Cobalt Co				0.06	0.03	0.01	0.01	0.00				
Copper Cu				0.51	0.26	0.06	0.08	0.02				
Iron Fe				71.37	32.47	12.37	14.60	3.83				
Lead Pb				0.03	0.01	0.01	0.00	0.00				
Lithium Li				1.74	0.83	0.26	0.32	0.08				
Magnesium Mg				2232	1150	395	438	115				
Manganese Mn				1.63	0.76	0.32	0.43	0.11				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.11	0.05	0.01	0.02	0.00				
Nickel Ni				0.25	0.12	0.03	0.04	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				1170	580	165	234	62				
Selenium Se				0.38	0.18	0.05	0.06	0.02				
Silicon SiO2				464	220	68	85	22				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				16380	8291	2525	3180	835				
Strontium Sr				12	6	2	3	1				
Tellurium Te				17.93	8.50	2.63	3.30	0.87				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.02	0.01	0.00	0.00	0.00				
Tin Sn				0.04	0.06	0.02	0.02	0.01				
Titanium Ti				5.44	2.58	0.80	1.00	0.26				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.66	0.31	0.08	0.09	0.02				
Zinc Zn				0.6	0.3	0.2	0.6	0.2				
Zirconium Zr				1.81	0.86	0.27	0.33	0.09				

Table H-3-A-1
Scenario 3

OUTPUT SUMMARY							Fraction of CCME in Doris Creek (%)
Discharge rate		1000000 m3/year					
Degradation Field(age)		Tail Lk Cu < CME Year		8			
		MMER	CCME	Tail Lake Year 2	Doris Creek Year 3	L'Roberts L Year 3	
Maximum Concentration							
pH			6 to 9	7 to 8	7 to 8	7 to 8	
TDS	mg/L			1583	216	199	
TSS	mg/L			3.7	6.8	8.1	
Free CN	mg/L		0.005	0.0036	0.00020	0.00010	4%
Total CN	mg/L	1.0		0.035	0.004	0.003	
WAD CN	mg/L			0.0048	0.0003	0.0001	
CNO	mg/L			4.0	0.22	0.12	
SCN	mg/L			0.118	0.006	0.003	
Sulphate	mg/L			109	8.7	7.1	
Chloride	mg/L			1051	113	91	
Total Ammonia	mg/L		0.97	1.31	0.084	0.045	9%
Nitrate	mg/L		2.9	6.8	0.39	0.20	13%
Nitrite	mg/L		0.018	0.53	0.032	0.018	175%
Alkalinity	mg/L			64	29	27	
OrthoPhosphate-P	mg/L			0.2149	0.0126	0.0071	
Phosphate-P	mg/L			0.2183	0.0315	0.0302	
Org. Carbon	mg/L			4.8	7.3	7.1	
Hardness CaCO3	mg/L			127	50	47	
Total Metals							
Aluminum Al	mg/L		0.1	0.14	0.08	0.25	83%
Antimony Sb	mg/L			0.0194	0.0035	0.0021	
Arsenic As	mg/L	0.5	0.005	0.00	0.0006	0.0006	13%
Barium Ba	mg/L			0.0125	0.0035	0.0054	
Beryllium Be	mg/L			0.00071	0.00005	0.00003	
Bismuth Bi	mg/L			0.01877	0.00107	0.00064	
Boron B	mg/L			0.034	0.034	0.030	
Cadmium Cd	mg/L		0.000038	0.000066	0.0000067	0.0000164	18%
Calcium Ca	mg/L			295	24	16	
Chromium Cr	mg/L		0.001	0.0078	0.001	0.001	103%
Cobalt Co	mg/L			0.0123	0.0013	0.0006	
Copper Cu	mg/L	0.3	0.002	0.011	0.0019	0.0021	97%
Iron Fe	mg/L		0.3	0.15	0.13	0.28	42%
Lead Pb	mg/L	0.2	0.002	0.00047	0.00008	0.00027	4%
Lithium Li	mg/L			0.0055	0.0029	0.0029	
Magnesium Mg	mg/L			10.6	7.5	7.4	
Manganese Mn	mg/L			0.034	0.021	0.025	
Mercury Hg	mg/L		0.0001	0.0000107	0.0000012	0.0000009	1%
Molybdenum Mo	mg/L		0.073	0.0107	0.00073	0.00048	1%
Nickel Ni	mg/L	0.5	0.025	0.010	0.0010	0.0009	4%
Phosphorus P	mg/L			0.305	0.036	0.033	
Potassium K	mg/L			49	5.3	4.1	
Selenium Se	mg/L		0.001	0.00081	0.00089	0.00084	89%
Silicon SiO2	mg/L			4.6	0.73	0.63	
Silver Ag	mg/L		0.0001	0.00013	0.0000088	0.0000073	9%
Sodium Na	mg/L			386	58	48	
Strontium Sr	mg/L			0.104	0.044	0.048	
Tellurium Te	mg/L			0.039	0.049	0.051	
Thallium Tl	mg/L		0.0008	0.000048	0.000031	0.002001	4%
Thorium Th	mg/L			0.000057	0.0000044	0.0000023	
Tin Sn	mg/L			0.00296	0.00054	0.00009	
Titanium Ti	mg/L			0.0115	0.0063	0.0063	
Uranium U	mg/L			0.000081	0.000042	0.000045	
Vanadium V	mg/L			0.0041	0.0007	0.0005	
Zinc Zn	mg/L	0.5	0.03	0.027	0.0042	0.0057	14%
Zirconium Zr	mg/L			0.0045	0.0050	0.0051	

Table H-3-A-2
Scenario 3

Water Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter													
TDS	mg/L				141	124	129	151	153				
TSS	mg/L				3.9	5.6	5.8	6.7	6.7				
Free CN	mg/L				0.00008	0.00001	0.00003	0.00003	0.00003				
Total CN	mg/L				0.003	0.002	0.002	0.002	0.002				
WAD CN	mg/L				0.0001	0.0000	0.0000	0.0000	0.0000				
CNO	mg/L				0.09	0.01	0.03	0.03	0.03				
SCN	mg/L				0.001	0.001	0.002	0.002	0.002				
Sulphate	mg/L				3.8	3.9	4.3	4.9	5.2				
Chloride	mg/L				61	62	62	67	69				
Total Ammonia	mg/L				0.019	0.044	0.022	0.030	0.030				
Nitrate	mg/L				0.08	0.11	0.14	0.18	0.21				
Nitrite	mg/L				0.011	0.013	0.014	0.006	0.016				
Alkalinity	mg/L				27	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0023	0.0025	0.0028	0.0034	0.0039				
Phosphate-P	mg/L				0.0173	0.0188	0.0250	0.0213	0.0218				
Org. Carbon	mg/L				5.3	5.0	7.3	4.9	4.9				
Hardness CaCO3	mg/L				45	43	43	45	45				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0010	0.0029	0.0008	0.0008				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0028	0.0032	0.0030	0.0032	0.0032				
Beryllium Be	mg/L				0.00002	0.00002	0.00002	0.00002	0.00003				
Bismuth Bi	mg/L				0.00012	0.00021	0.00028	0.00033	0.00039				
Boron B	mg/L				0.033	0.022	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000037	0.0000040	0.0000038	0.0000040	0.0000043				
Calcium Ca	mg/L				11	11	11	12	13				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0010	0.0003	0.0003				
Copper Cu	mg/L				0.0013	0.0016	0.0014	0.0016	0.0017				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00007	0.00005	0.00005	0.00005				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.1	6.4	6.5	6.4	6.4				
Manganese Mn	mg/L				0.007	0.020	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000008	0.0000008				
Molybdenum Mo	mg/L				0.00026	0.00027	0.00032	0.00034	0.00038				
Nickel Ni	mg/L				0.0005	0.0007	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.019	0.021	0.027	0.024	0.025				
Potassium K	mg/L				3.2	2.9	3.0	3.1	3.3				
Selenium Se	mg/L				0.00086	0.00056	0.00060	0.00055	0.00055				
Silicon SiO2	mg/L				0.54	0.55	0.57	0.58	0.60				
Silver Ag	mg/L				0.0000049	0.0000058	0.0000060	0.0000064	0.0000065				
Sodium Na	mg/L				38	32	34	32	32				
Strontium Sr	mg/L				0.040	0.041	0.036	0.040	0.040				
Tellurium Te	mg/L				0.049	0.049	0.049	0.049	0.049				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00040	0.00041	0.00042	0.00043	0.00044				
Titanium Ti	mg/L				0.0058	0.0059	0.0059	0.0059	0.0059				
Uranium U	mg/L				0.000026	0.000032	0.000039	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0011	0.0033	0.0031	0.0021	0.0022				
Zirconium Zr	mg/L				0.0049	0.0049	0.0049	0.0049	0.0049				

Table H-3-A-2
Scenario 3

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter													
TDS	mg/L				160	139	143	165	166				
TSS	mg/L				3.9	5.7	5.8	6.8	6.8				
Free CN	mg/L				0.00020		0.00003	0.00003	0.00003				
Total CN	mg/L				0.004	0.002	0.002	0.002	0.002				
WAD CN	mg/L				0.0003		0.0000	0.0000	0.0000				
CNO	mg/L				0.22		0.03	0.03	0.03				
SCN	mg/L				0.005	0.004	0.004	0.005	0.005				
Sulphate	mg/L				7.3	6.7	6.9	7.5	7.7				
Chloride	mg/L				74	73	71	77	78				
Total Ammonia	mg/L				0.044	0.084	0.016	0.031	0.030				
Nitrate	mg/L				0.29	0.30	0.31	0.35	0.37				
Nitrite	mg/L				0.032	0.012	0.014	0.005	0.016				
Alkalinity	mg/L				29	27	28	28	28				
OrthoPhosphate-P	mg/L				0.0073	0.0064	0.0065	0.0071	0.0075				
Phosphate-P	mg/L				0.0223	0.0228	0.0286	0.0250	0.0254				
Org. Carbon	mg/L				5.4	5.0	7.3	4.9	4.9				
Hardness CaCO3	mg/L				48	45	45	47	47				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0009	0.0013	0.0033	0.0011	0.0011				
Arsenic As	mg/L				0.0006	0.0005	0.0005	0.0005	0.0005				
Barium Ba	mg/L				0.0032	0.0035	0.0033	0.0035	0.0035				
Beryllium Be	mg/L				0.00003	0.00003	0.00003	0.00004	0.00004				
Bismuth Bi	mg/L				0.00056	0.00056	0.00059	0.00066	0.00070				
Boron B	mg/L				0.034	0.023	0.023	0.023	0.023				
Cadmium Cd	mg/L				0.0000059	0.0000057	0.0000053	0.0000056	0.0000058				
Calcium Ca	mg/L				21	18	18	19	20				
Chromium Cr	mg/L				0.001	0.001	0.001	0.001	0.001				
Cobalt Co	mg/L				0.0006	0.0006	0.0013	0.0006	0.0006				
Copper Cu	mg/L				0.0016	0.0019	0.0016	0.0019	0.0019				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00004	0.00008	0.00006	0.00006	0.00006				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.4	6.6	6.7	6.6	6.6				
Manganese Mn	mg/L				0.008	0.021	0.014	0.011	0.011				
Mercury Hg	mg/L				0.0000009	0.0000009	0.0000009	0.0000009	0.0000010				
Molybdenum Mo	mg/L				0.00060	0.00054	0.00057	0.00060	0.00062				
Nickel Ni	mg/L				0.0008	0.0009	0.0008	0.0008	0.0009				
Phosphorus P	mg/L				0.027	0.027	0.033	0.030	0.030				
Potassium K	mg/L				4.8	4.1	4.1	4.3	4.4				
Selenium Se	mg/L				0.00087	0.00057	0.00061	0.00055	0.00056				
Silicon SiO2	mg/L				0.68	0.66	0.66	0.68	0.69				
Silver Ag	mg/L				0.0000070	0.0000074	0.0000075	0.0000079	0.0000080				
Sodium Na	mg/L				39	33	35	33	33				
Strontium Sr	mg/L				0.043	0.044	0.038	0.042	0.043				
Tellurium Te	mg/L				0.049	0.049	0.049	0.049	0.049				
Thallium Tl	mg/L				0.000031	0.000031	0.000031	0.000031	0.000031				
Thorium Th	mg/L				0.000002	0.000003	0.000003	0.000003	0.000003				
Tin Sn	mg/L				0.00046	0.00046	0.00047	0.00048	0.00049				
Titanium Ti	mg/L				0.0059	0.0059	0.0059	0.0059	0.0059				
Uranium U	mg/L				0.000027	0.000032	0.000040	0.000034	0.000034				
Vanadium V	mg/L				0.0007	0.0002	0.0004	0.0003	0.0003				
Zinc Zn	mg/L				0.0020	0.0040	0.0037	0.0028	0.0028				
Zirconium Zr	mg/L				0.0049	0.0049	0.0049	0.0049	0.0049				

Table H-3-A-2
Scenario 3

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter													
TDS	mg/L				171	148	150	171	172				
TSS	mg/L				3.9	5.7	5.8	6.8	6.8				
Free CN	mg/L				0.00013								
Total CN	mg/L				0.003	0.002	0.002	0.002	0.002				
WAD CN	mg/L				0.0002								
CNO	mg/L				0.14								
SCN	mg/L				0.006	0.005	0.005	0.005	0.005				
Sulphate	mg/L				8.7	7.5	7.4	7.7	7.6				
Chloride	mg/L				82	80	78	83	84				
Total Ammonia	mg/L				0.036	0.057	0.016	0.017	0.017				
Nitrate	mg/L				0.39	0.36	0.35	0.38	0.38				
Nitrite	mg/L				0.030	0.009	0.014	0.004	0.004				
Alkalinity	mg/L				29	27	28	28	28				
OrthoPhosphate-P	mg/L				0.0105	0.0091	0.0090	0.0098	0.0101				
Phosphate-P	mg/L				0.0256	0.0255	0.0311	0.0277	0.0280				
Org. Carbon	mg/L				5.4	5.0	7.3	4.9	4.9				
Hardness CaCO3	mg/L				50	46	46	47	47				
Total Metals													
Aluminum Al	mg/L				0.04	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0012	0.0016	0.0035	0.0013	0.0014				
Arsenic As	mg/L				0.0006	0.0005	0.0005	0.0005	0.0005				
Barium Ba	mg/L				0.0034	0.0035	0.0034	0.0035	0.0035				
Beryllium Be	mg/L				0.00004	0.00004	0.00004	0.00004	0.00004				
Bismuth Bi	mg/L				0.00085	0.00080	0.00082	0.00089	0.00093				
Boron B	mg/L				0.034	0.023	0.024	0.023	0.023				
Cadmium Cd	mg/L				0.0000067	0.0000062	0.0000055	0.0000056	0.0000056				
Calcium Ca	mg/L				24	20	19	19	19				
Chromium Cr	mg/L				0.001	0.001	0.001	0.001	0.001				
Cobalt Co	mg/L				0.0007	0.0007	0.0013	0.0006	0.0006				
Copper Cu	mg/L				0.0017	0.0019	0.0017	0.0019	0.0019				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00005	0.00008	0.00006	0.00006	0.00006				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.5	6.7	6.8	6.6	6.6				
Manganese Mn	mg/L				0.008	0.021	0.014	0.011	0.011				
Mercury Hg	mg/L				0.0000010	0.0000009	0.0000009	0.0000009	0.0000009				
Molybdenum Mo	mg/L				0.00073	0.00061	0.00060	0.00059	0.00058				
Nickel Ni	mg/L				0.0009	0.0010	0.0009	0.0009	0.0008				
Phosphorus P	mg/L				0.032	0.031	0.036	0.033	0.033				
Potassium K	mg/L				5.3	4.4	4.3	4.2	4.2				
Selenium Se	mg/L				0.00088	0.00057	0.00061	0.00056	0.00056				
Silicon SiO2	mg/L				0.73	0.69	0.68	0.69	0.68				
Silver Ag	mg/L				0.0000082	0.0000083	0.0000082	0.0000085	0.0000085				
Sodium Na	mg/L				40	34	35	33	33				
Strontium Sr	mg/L				0.044	0.044	0.038	0.042	0.042				
Tellurium Te	mg/L				0.049	0.049	0.049	0.049	0.049				
Thallium Tl	mg/L				0.000031	0.000031	0.000031	0.000031	0.000031				
Thorium Th	mg/L				0.000003	0.000003	0.000003	0.000003	0.000003				
Tin Sn	mg/L				0.00051	0.00050	0.00051	0.00052	0.00052				
Titanium Ti	mg/L				0.0059	0.0059	0.0059	0.0059	0.0059				
Uranium U	mg/L				0.000028	0.000032	0.000040	0.000034	0.000034				
Vanadium V	mg/L				0.0007	0.0002	0.0004	0.0003	0.0003				
Zinc Zn	mg/L				0.0023	0.0042	0.0038	0.0028	0.0028				
Zirconium Zr	mg/L				0.0049	0.0049	0.0049	0.0050	0.0050				

Table H-3-A-2
Scenario 3

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter													
TDS	mg/L				173	158	169	201	212				
TSS	mg/L				3.9	5.7	5.8	6.8	6.8				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.005	0.004	0.003	0.003	0.003				
Sulphate	mg/L				7.4	6.3	6.1	6.4	6.3				
Chloride	mg/L				88	89	91	103	110				
Total Ammonia	mg/L				0.012	0.012	0.017	0.016	0.016				
Nitrate	mg/L				0.34	0.29	0.28	0.29	0.29				
Nitrite	mg/L				0.011	0.002	0.003	0.003	0.003				
Alkalinity	mg/L				29	26	28	28	28				
OrthoPhosphate-P	mg/L				0.0126	0.0100	0.0092	0.0094	0.0092				
Phosphate-P	mg/L				0.0276	0.0265	0.0315	0.0275	0.0273				
Org. Carbon	mg/L				5.4	5.1	7.3	5.0	5.0				
Hardness CaCO3	mg/L				48	45	44	46	46				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0014	0.0016	0.0035	0.0012	0.0012				
Arsenic As	mg/L				0.0006	0.0005	0.0005	0.0005	0.0005				
Barium Ba	mg/L				0.0032	0.0034	0.0032	0.0033	0.0033				
Beryllium Be	mg/L				0.00005	0.00004	0.00004	0.00004	0.00004				
Bismuth Bi	mg/L				0.00107	0.00085	0.00077	0.00079	0.00077				
Boron B	mg/L				0.034	0.023	0.024	0.023	0.023				
Cadmium Cd	mg/L				0.0000060	0.0000056	0.0000050	0.0000052	0.0000052				
Calcium Ca	mg/L				20	17	17	17	18				
Chromium Cr	mg/L				0.001	0.001	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0005	0.0005	0.0012	0.0004	0.0004				
Copper Cu	mg/L				0.0016	0.0018	0.0015	0.0018	0.0018				
Iron Fe	mg/L				0.05	0.12	0.09	0.09	0.09				
Lead Pb	mg/L				0.00004	0.00008	0.00006	0.00006	0.00006				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.4	6.7	6.7	6.6	6.6				
Manganese Mn	mg/L				0.008	0.021	0.014	0.011	0.011				
Mercury Hg	mg/L				0.0000009	0.0000010	0.0000010	0.0000011	0.0000011				
Molybdenum Mo	mg/L				0.00056	0.00047	0.00047	0.00046	0.00045				
Nickel Ni	mg/L				0.0008	0.0009	0.0008	0.0007	0.0007				
Phosphorus P	mg/L				0.033	0.031	0.035	0.031	0.031				
Potassium K	mg/L				4.6	3.8	3.7	3.7	3.6				
Selenium Se	mg/L				0.00088	0.00057	0.00062	0.00056	0.00057				
Silicon SiO2	mg/L				0.68	0.65	0.64	0.65	0.65				
Silver Ag	mg/L				0.0000088	0.0000086	0.0000083	0.0000086	0.0000085				
Sodium Na	mg/L				39	37	42	44	48				
Strontium Sr	mg/L				0.043	0.043	0.037	0.042	0.042				
Tellurium Te	mg/L				0.049	0.049	0.049	0.049	0.049				
Thallium Tl	mg/L				0.000031	0.000031	0.000031	0.000031	0.000031				
Thorium Th	mg/L				0.000003	0.000003	0.000004	0.000004	0.000004				
Tin Sn	mg/L				0.00054	0.00051	0.00050	0.00050	0.00050				
Titanium Ti	mg/L				0.0059	0.0060	0.0061	0.0061	0.0061				
Uranium U	mg/L				0.000028	0.000033	0.000041	0.000035	0.000035				
Vanadium V	mg/L				0.0007	0.0002	0.0004	0.0003	0.0003				
Zinc Zn	mg/L				0.0020	0.0039	0.0036	0.0025	0.0025				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-3-A-2
Scenario 3

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter													
TDS	mg/L				216	179	176	187	186				
TSS	mg/L				4.0	5.7	5.9	6.8	6.8				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.003	0.002	0.002	0.002	0.002				
Sulphate	mg/L				6.0	5.1	4.9	4.8	4.7				
Chloride	mg/L				113	100	94	93	92				
Total Ammonia	mg/L				0.008	0.013	0.017	0.016	0.016				
Nitrate	mg/L				0.23	0.20	0.19	0.17	0.17				
Nitrite	mg/L				0.003	0.003	0.003	0.003	0.003				
Alkalinity	mg/L				28	26	28	27	27				
OrthoPhosphate-P	mg/L				0.0088	0.0068	0.0061	0.0055	0.0053				
Phosphate-P	mg/L				0.0241	0.0235	0.0286	0.0237	0.0236				
Org. Carbon	mg/L				5.4	5.1	7.3	5.0	5.0				
Hardness CaCO3	mg/L				47	44	44	45	45				
Total Metals													
Aluminum Al	mg/L				0.04	0.06	0.08	0.07	0.08				
Antimony Sb	mg/L				0.0011	0.0013	0.0032	0.0009	0.0009				
Arsenic As	mg/L				0.0006	0.0005	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0031	0.0033	0.0031	0.0032	0.0032				
Beryllium Be	mg/L				0.00004	0.00003	0.00003	0.00003	0.00003				
Bismuth Bi	mg/L				0.00074	0.00056	0.00050	0.00044	0.00043				
Boron B	mg/L				0.034	0.023	0.024	0.023	0.023				
Cadmium Cd	mg/L				0.0000055	0.0000052	0.0000047	0.0000045	0.0000045				
Calcium Ca	mg/L				19	16	15	14	13				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0004	0.0004	0.0011	0.0003	0.0003				
Copper Cu	mg/L				0.0015	0.0017	0.0014	0.0016	0.0016				
Iron Fe	mg/L				0.05	0.12	0.09	0.09	0.09				
Lead Pb	mg/L				0.00004	0.00008	0.00005	0.00005	0.00005				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.4	6.6	6.7	6.5	6.5				
Manganese Mn	mg/L				0.007	0.020	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000011	0.0000011	0.0000012	0.0000011	0.0000012				
Molybdenum Mo	mg/L				0.00044	0.00036	0.00037	0.00032	0.00032				
Nickel Ni	mg/L				0.0007	0.0008	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.028	0.026	0.031	0.026	0.026				
Potassium K	mg/L				4.0	3.3	3.2	3.0	3.0				
Selenium Se	mg/L				0.00089	0.00058	0.00063	0.00057	0.00057				
Silicon SiO2	mg/L				0.64	0.62	0.61	0.59	0.59				
Silver Ag	mg/L				0.0000084	0.0000083	0.0000081	0.0000073	0.0000073				
Sodium Na	mg/L				58	47	47	43	43				
Strontium Sr	mg/L				0.042	0.043	0.037	0.040	0.040				
Tellurium Te	mg/L				0.049	0.049	0.049	0.049	0.049				
Thallium Tl	mg/L				0.000031	0.000031	0.000031	0.000031	0.000031				
Thorium Th	mg/L				0.000004	0.000004	0.000004	0.000004	0.000004				
Tin Sn	mg/L				0.00050	0.00047	0.00046	0.00045	0.00045				
Titanium Ti	mg/L				0.0061	0.0062	0.0062	0.0062	0.0062				
Uranium U	mg/L				0.000029	0.000034	0.000042	0.000035	0.000035				
Vanadium V	mg/L				0.0007	0.0002	0.0004	0.0003	0.0003				
Zinc Zn	mg/L				0.0017	0.0037	0.0033	0.0021	0.0021				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-3-A-2
Scenario 3

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter													
TDS	mg/L				177	150	150	170	167				
TSS	mg/L				4.0	5.7	5.9	6.8	6.8				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.002	0.001	0.001	0.001	0.001				
Sulphate	mg/L				4.4	3.9	3.9	4.1	3.9				
Chloride	mg/L				87	81	77	81	79				
Total Ammonia	mg/L				0.005	0.009	0.014	0.013	0.013				
Nitrate	mg/L				0.10	0.09	0.09	0.10	0.09				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				28	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0049	0.0039	0.0036	0.0036	0.0034				
Phosphate-P	mg/L				0.0202	0.0206	0.0261	0.0220	0.0217				
Org. Carbon	mg/L				5.4	5.1	7.3	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.04	0.06	0.08	0.08	0.08				
Antimony Sb	mg/L				0.0007	0.0011	0.0029	0.0007	0.0007				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00002	0.00002	0.00002	0.00002	0.00002				
Bismuth Bi	mg/L				0.00039	0.00030	0.00028	0.00028	0.00026				
Boron B	mg/L				0.034	0.023	0.023	0.023	0.023				
Cadmium Cd	mg/L				0.0000040	0.0000039	0.0000034	0.0000035	0.0000034				
Calcium Ca	mg/L				14	12	11	11	11				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0010	0.0002	0.0002				
Copper Cu	mg/L				0.0013	0.0016	0.0013	0.0016	0.0016				
Iron Fe	mg/L				0.05	0.12	0.09	0.09	0.09				
Lead Pb	mg/L				0.00003	0.00007	0.00005	0.00004	0.00004				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.2	6.5	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.020	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000010	0.0000011	0.0000011	0.0000012	0.0000011				
Molybdenum Mo	mg/L				0.00030	0.00026	0.00028	0.00026	0.00025				
Nickel Ni	mg/L				0.0006	0.0007	0.0006	0.0005	0.0005				
Phosphorus P	mg/L				0.022	0.022	0.027	0.023	0.023				
Potassium K	mg/L				3.4	2.9	2.8	2.8	2.7				
Selenium Se	mg/L				0.00088	0.00058	0.00063	0.00057	0.00057				
Silicon SiO2	mg/L				0.58	0.57	0.57	0.57	0.56				
Silver Ag	mg/L				0.0000059	0.0000062	0.0000060	0.0000063	0.0000058				
Sodium Na	mg/L				48	40	41	39	38				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.049	0.049	0.049	0.049	0.049				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000003	0.000003	0.000003	0.000003	0.000003				
Tin Sn	mg/L				0.00044	0.00043	0.00043	0.00043	0.00042				
Titanium Ti	mg/L				0.0061	0.0062	0.0062	0.0063	0.0062				
Uranium U	mg/L				0.000027	0.000032	0.000040	0.000034	0.000034				
Vanadium V	mg/L				0.0006	0.0002	0.0003	0.0003	0.0002				
Zinc Zn	mg/L				0.0013	0.0034	0.0030	0.0020	0.0020				
Zirconium Zr	mg/L				0.0049	0.0049	0.0050	0.0050	0.0050				

Table H-3-A-2
Scenario 3

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter													
TDS	mg/L				158	135	137	154	154				
TSS	mg/L				4.0	5.7	5.9	6.8	6.8				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.001	0.001	0.001	0.001	0.000				
Sulphate	mg/L				3.6	3.3	3.4	3.4	3.4				
Chloride	mg/L				75	71	68	71	71				
Total Ammonia	mg/L				0.005	0.008	0.013	0.012	0.012				
Nitrate	mg/L				0.04	0.03	0.03	0.03	0.03				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				27	25	27	26	26				
OrthoPhosphate-P	mg/L				0.0030	0.0025	0.0023	0.0021	0.0021				
Phosphate-P	mg/L				0.0184	0.0193	0.0249	0.0204	0.0204				
Org. Carbon	mg/L				5.4	5.1	7.3	4.9	5.0				
Hardness CaCO3	mg/L				45	42	42	43	43				
Total Metals													
Aluminum Al	mg/L				0.04	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0006	0.0009	0.0028	0.0006	0.0006				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0031	0.0030	0.0030	0.0030				
Beryllium Be	mg/L				0.00002	0.00002	0.00002	0.00001	0.00001				
Bismuth Bi	mg/L				0.00023	0.00018	0.00016	0.00015	0.00014				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000037	0.0000035	0.0000029	0.0000028	0.0000028				
Calcium Ca	mg/L				11	10	10	9	9				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0002	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0013	0.0016	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.06	0.13	0.09	0.09	0.09				
Lead Pb	mg/L				0.00003	0.00007	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0029	0.0029	0.0028	0.0028				
Magnesium Mg	mg/L				7.2	6.5	6.6	6.4	6.4				
Manganese Mn	mg/L				0.007	0.020	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000011	0.0000011	0.0000011	0.0000011	0.0000011				
Molybdenum Mo	mg/L				0.00024	0.00021	0.00024	0.00021	0.00021				
Nickel Ni	mg/L				0.0005	0.0006	0.0005	0.0005	0.0005				
Phosphorus P	mg/L				0.019	0.020	0.025	0.021	0.021				
Potassium K	mg/L				3.1	2.7	2.6	2.5	2.5				
Selenium Se	mg/L				0.00089	0.00058	0.00063	0.00056	0.00056				
Silicon SiO2	mg/L				0.55	0.55	0.55	0.54	0.54				
Silver Ag	mg/L				0.0000053	0.0000056	0.0000053	0.0000048	0.0000047				
Sodium Na	mg/L				44	37	38	35	35				
Strontium Sr	mg/L				0.040	0.041	0.036	0.039	0.039				
Tellurium Te	mg/L				0.049	0.049	0.049	0.049	0.049				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000003	0.000003	0.000003	0.000002	0.000002				
Tin Sn	mg/L				0.00042	0.00041	0.00041	0.00040	0.00040				
Titanium Ti	mg/L				0.0062	0.0062	0.0062	0.0062	0.0062				
Uranium U	mg/L				0.000027	0.000032	0.000040	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0012	0.0032	0.0029	0.0018	0.0018				
Zirconium Zr	mg/L				0.0049	0.0049	0.0049	0.0049	0.0049				

Table H-3-A-2
Scenario 3

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter													
TDS	mg/L				148	128	131	148	148				
TSS	mg/L				4.0	5.7	5.9	6.8	6.8				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.000	0.000	0.000	0.000	0.000				
Sulphate	mg/L				3.2	3.0	3.1	3.2	3.2				
Chloride	mg/L				68	66	64	67	67				
Total Ammonia	mg/L				0.005	0.008	0.013	0.012	0.012				
Nitrate	mg/L				0.01	0.01	0.01	0.01	0.01				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				27	25	27	26	26				
OrthoPhosphate-P	mg/L				0.0020	0.0017	0.0016	0.0015	0.0015				
Phosphate-P	mg/L				0.0174	0.0185	0.0242	0.0198	0.0198				
Org. Carbon	mg/L				5.4	5.1	7.3	5.0	5.0				
Hardness CaCO3	mg/L				45	42	42	43	43				
Total Metals													
Aluminum Al	mg/L				0.04	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0005	0.0009	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0028	0.0031	0.0029	0.0030	0.0030				
Beryllium Be	mg/L				0.00002	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00014	0.00011	0.00010	0.00009	0.00009				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000032	0.0000031	0.0000026	0.0000025	0.0000025				
Calcium Ca	mg/L				10	9	9	8	8				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0002	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.06	0.13	0.09	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.2	6.5	6.5	6.4	6.4				
Manganese Mn	mg/L				0.007	0.020	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000011	0.0000011	0.0000011	0.0000011	0.0000011				
Molybdenum Mo	mg/L				0.00020	0.00019	0.00021	0.00019	0.00019				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0005	0.0005				
Phosphorus P	mg/L				0.018	0.019	0.024	0.020	0.020				
Potassium K	mg/L				3.0	2.6	2.5	2.4	2.4				
Selenium Se	mg/L				0.00089	0.00058	0.00063	0.00056	0.00056				
Silicon SiO2	mg/L				0.54	0.54	0.54	0.53	0.53				
Silver Ag	mg/L				0.0000047	0.0000051	0.0000049	0.0000044	0.0000043				
Sodium Na	mg/L				42	35	36	34	34				
Strontium Sr	mg/L				0.040	0.041	0.035	0.039	0.039				
Tellurium Te	mg/L				0.049	0.049	0.049	0.049	0.049				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0062	0.0062	0.0063	0.0062	0.0062				
Uranium U	mg/L				0.000027	0.000031	0.000039	0.000032	0.000032				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0011	0.0032	0.0029	0.0018	0.0018				
Zirconium Zr	mg/L				0.0049	0.0049	0.0049	0.0049	0.0049				

Table H-3-A-2
Scenario 3

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter													
TDS	mg/L				142	123	127	146	145				
TSS	mg/L				3.9	5.7	5.9	6.8	6.8				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.000	0.000	0.000	0.000	0.000				
Sulphate	mg/L				3.0	2.8	2.9	3.1	3.1				
Chloride	mg/L				64	63	61	65	65				
Total Ammonia	mg/L				0.005	0.008	0.013	0.012	0.012				
Nitrate	mg/L				0.01	0.01	0.01	0.01	0.01				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				27	25	27	26	26				
OrthoPhosphate-P	mg/L				0.0014	0.0013	0.0012	0.0012	0.0012				
Phosphate-P	mg/L				0.0168	0.0181	0.0238	0.0196	0.0195				
Org. Carbon	mg/L				5.4	5.1	7.3	5.0	5.0				
Hardness CaCO3	mg/L				44	42	42	43	43				
Total Metals													
Aluminum Al	mg/L				0.04	0.06	0.08	0.08	0.08				
Antimony Sb	mg/L				0.0004	0.0008	0.0027	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0028	0.0031	0.0029	0.0030	0.0030				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00008	0.00007	0.00007	0.00007	0.00006				
Boron B	mg/L				0.034	0.023	0.023	0.023	0.022				
Cadmium Cd	mg/L				0.0000029	0.0000029	0.0000024	0.0000024	0.0000024				
Calcium Ca	mg/L				9	8	8	8	8				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0002	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.06	0.13	0.09	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0029	0.0028				
Magnesium Mg	mg/L				7.1	6.4	6.5	6.4	6.4				
Manganese Mn	mg/L				0.006	0.020	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000010	0.0000011	0.0000011	0.0000011	0.0000011				
Molybdenum Mo	mg/L				0.00018	0.00017	0.00020	0.00018	0.00018				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0005	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.024	0.019	0.019				
Potassium K	mg/L				2.9	2.5	2.5	2.4	2.4				
Selenium Se	mg/L				0.00088	0.00058	0.00062	0.00057	0.00057				
Silicon SiO2	mg/L				0.53	0.53	0.53	0.53	0.53				
Silver Ag	mg/L				0.0000041	0.0000046	0.0000045	0.0000046	0.0000043				
Sodium Na	mg/L				40	34	35	33	33				
Strontium Sr	mg/L				0.040	0.041	0.035	0.039	0.039				
Tellurium Te	mg/L				0.049	0.049	0.049	0.049	0.049				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00039	0.00039	0.00039	0.00039	0.00039				
Titanium Ti	mg/L				0.0062	0.0062	0.0063	0.0063	0.0063				
Uranium U	mg/L				0.000026	0.000031	0.000039	0.000033	0.000032				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0010	0.0031	0.0028	0.0017	0.0018				
Zirconium Zr	mg/L				0.0049	0.0049	0.0049	0.0049	0.0049				

Table H-3-A-2
Scenario 3

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16
Parameter												
TDS	mg/L				140	121	125	143	143			
TSS	mg/L				3.9	5.7	5.9	6.8	6.8			
Free CN	mg/L											
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002			
WAD CN	mg/L											
CNO	mg/L											
SCN	mg/L				0.000	0.000	0.000	0.000	0.000			
Sulphate	mg/L				2.9	2.7	2.9	3.0	3.0			
Chloride	mg/L				62	62	60	63	63			
Total Ammonia	mg/L				0.005	0.008	0.013	0.012	0.012			
Nitrate	mg/L				0.01	0.01	0.01	0.01	0.01			
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002			
Alkalinity	mg/L				27	25	27	26	26			
OrthoPhosphate-P	mg/L				0.0011	0.0010	0.0010	0.0010	0.0010			
Phosphate-P	mg/L				0.0166	0.0179	0.0236	0.0193	0.0193			
Org. Carbon	mg/L				5.4	5.1	7.3	4.9	5.0			
Hardness CaCO3	mg/L				44	42	42	43	43			
Total Metals												
Aluminum Al	mg/L				0.04	0.06	0.08	0.07	0.07			
Antimony Sb	mg/L				0.0004	0.0008	0.0027	0.0005	0.0005			
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004			
Barium Ba	mg/L				0.0028	0.0031	0.0029	0.0030	0.0030			
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001			
Bismuth Bi	mg/L				0.00006	0.00005	0.00005	0.00005	0.00005			
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022			
Cadmium Cd	mg/L				0.0000028	0.0000028	0.0000023	0.0000023	0.0000023			
Calcium Ca	mg/L				9	8	8	7	7			
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000			
Cobalt Co	mg/L				0.0001	0.0001	0.0009	0.0001	0.0001			
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015			
Iron Fe	mg/L				0.06	0.13	0.09	0.09	0.09			
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004			
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028			
Magnesium Mg	mg/L				7.1	6.4	6.5	6.4	6.4			
Manganese Mn	mg/L				0.006	0.020	0.013	0.010	0.010			
Mercury Hg	mg/L				0.0000011	0.0000011	0.0000011	0.0000011	0.0000011			
Molybdenum Mo	mg/L				0.00017	0.00016	0.00019	0.00017	0.00017			
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004			
Phosphorus P	mg/L				0.016	0.018	0.023	0.019	0.019			
Potassium K	mg/L				2.8	2.4	2.4	2.4	2.4			
Selenium Se	mg/L				0.00088	0.00058	0.00063	0.00056	0.00056			
Silicon SiO2	mg/L				0.52	0.53	0.53	0.52	0.52			
Silver Ag	mg/L				0.0000040	0.0000045	0.0000044	0.0000040	0.0000039			
Sodium Na	mg/L				40	34	35	33	33			
Strontium Sr	mg/L				0.040	0.041	0.035	0.039	0.039			
Tellurium Te	mg/L				0.049	0.049	0.049	0.049	0.049			
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000029	0.000030			
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002			
Tin Sn	mg/L				0.00039	0.00039	0.00039	0.00039	0.00039			
Titanium Ti	mg/L				0.0062	0.0062	0.0063	0.0062	0.0062			
Uranium U	mg/L				0.000026	0.000031	0.000039	0.000032	0.000032			
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002			
Zinc Zn	mg/L				0.0010	0.0031	0.0028	0.0017	0.0017			
Zirconium Zr	mg/L				0.0049	0.0049	0.0049	0.0049	0.0049			

Table H 3-A-3
Scenario 3**Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter												
TDS				1073956	586904	257660	384118	135770				
TSS				29483	26699	11501	17154	5992				
Free CN				0.60	0.05	0.05	0.07	0.02				
Total CN				21	9	4	5	2				
WAD CN				0.81	0.07	0.07	0.09	0.03				
CNO				665	55	57	77	27				
SCN				9	6	3	5	2				
Sulphate				28611	18314	8584	12413	4649				
Chloride				468083	295283	123233	171437	61017				
Total Ammonia				143	209	44	77	27				
Nitrate				576	521	281	463	185				
Nitrite				83	63	27	14	14				
Alkalinity				206688	119301	53699	68141	23935				
OrthoPhosphate-P				17	12	6	9	3				
Phosphate-P				132	89	50	54	19				
Org. Carbon				40778	23698	14478	12543	4379				
Hardness CaCO3				342229	200983	84935	113548	39956				
Total Metals												
Aluminum Al				250	275	156	179	63				
Antimony Sb				3.4	4.6	5.9	1.9	0.7				
Arsenic As				3.8	2.1	0.8	1.1	0.4				
Barium Ba				22	15	6	8	3				
Beryllium Be				0.13	0.09	0.04	0.06	0.02				
Bismuth Bi				0.92	0.99	0.55	0.85	0.35				
Boron B				253	104	45	56	20				
Cadmium Cd				0.03	0.02	0.01	0.01	0.00				
Calcium Ca				84525	51177	22658	31216	11723				
Chromium Cr				5	2	1	1	0				
Cobalt Co				1.30	1.29	2.02	0.75	0.30				
Copper Cu				10	8	3	4	1				
Iron Fe				379	566	163	223	78				
Lead Pb				0.19	0.32	0.09	0.12	0.04				
Lithium Li				21	13	6	7	3				
Magnesium Mg				53966	30305	12948	16335	5728				
Manganese Mn				50	95	26	26	9				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.96	1.26	0.64	0.87	0.33				
Nickel Ni				3.73	3.14	1.18	1.54	0.56				
Phosphorus P				142	97	54	61	22				
Potassium K				24293	13560	5932	7916	2900				
Selenium Se				6.59	2.64	1.20	1.39	0.49				
Silicon SiO2				4141	2613	1126	1487	532				
Silver Ag				0.04	0.03	0.01	0.02	0.01				
Sodium Na				289400	152276	66908	80717	28310				
Strontium Sr				303	195	71	102	36				
Tellurium Te				370	230	97	125	43				
Thallium Tl				0.23	0.14	0.06	0.08	0.03				
Thorium Th				0.01	0.01	0.00	0.01	0.00				
Tin Sn				3.02	1.94	0.84	1.10	0.39				
Titanium Ti				44	28	12	15	5				
Uranium U				0.20	0.15	0.08	0.09	0.03				
Vanadium V				4.30	0.49	0.59	0.57	0.21				
Zinc Zn				8.69	15.69	6.16	5.40	1.97				
Zirconium Zr				37	23	10	13	4				

Table H 3-A-3
Scenario 3**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter												
TDS				1220165	658674	285400	420123	147948				
TSS				29841	26873		11568	17241	6021			
Free CN				1.54		0.05	0.07	0.02				
Total CN				29	9	4	5	2				
WAD CN				2.06		0.07	0.09	0.03				
CNO				1699		58	76	26				
SCN				38	21	9	13	5				
Sulphate				55480	31510	13684	19031	6887				
Chloride				564931	342809	141595	195266	69076				
Total Ammonia				335	399	33	79	27				
Nitrate				2202	1396	617	901	333				
Nitrite				244	59	28	13	14				
Alkalinity				219476	125568	56119	71284	24998				
OrthoPhosphate-P				55	30	13	18	7				
Phosphate-P				170	108	57	64	23				
Org. Carbon				40852	23731	14490	12559	4385				
Hardness CaCO3				369674	214447	90137	120301	42240				
Total Metals												
Aluminum Al				261	280	158	182	64				
Antimony Sb				6.9	6.3	6.5	2.8	1.0				
Arsenic As				4.6	2.4	1.0	1.3	0.5				
Barium Ba				25	16	7	9	3				
Beryllium Be				0.26	0.15	0.07	0.09	0.03				
Bismuth Bi				4.27	2.63	1.18	1.68	0.62				
Boron B				259	107	47	58	20				
Cadmium Cd				0.04	0.03	0.01	0.01	0.01				
Calcium Ca				157237	86903	36468	49138	17785				
Chromium Cr				7	3	1	1	1				
Cobalt Co				4.35	2.79	2.60	1.51	0.55				
Copper Cu				12	9	3	5	2				
Iron Fe				389	571	165	226	79				
Lead Pb				0.30	0.37	0.11	0.15	0.05				
Lithium Li				22	14	6	7	3				
Magnesium Mg				56099	31350	13351	16859	5905				
Manganese Mn				59	99	28	28	10				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				4.61	2.56	1.14	1.52	0.55				
Nickel Ni				6.10	4.31	1.63	2.12	0.76				
Phosphorus P				205	128	66	76	27				
Potassium K				36288	19454	8210	10872	3899				
Selenium Se				6.66	2.67	1.22	1.41	0.49				
Silicon SiO2				5179	3122	1323	1743	618				
Silver Ag				0.05	0.04	0.01	0.02	0.01				
Sodium Na				301047	157988	69115	83582	29279				
Strontium Sr				326	207	76	108	38				
Tellurium Te				370	230	97	125	44				
Thallium Tl				0.23	0.15	0.06	0.08	0.03				
Thorium Th				0.02	0.01	0.01	0.01	0.00				
Tin Sn				3.54	2.20	0.94	1.23	0.43				
Titanium Ti				45	28	12	15	5				
Uranium U				0.21	0.15	0.08	0.09	0.03				
Vanadium V				5.14	0.91	0.75	0.77	0.28				
Zinc Zn				15.33	18.96	7.42	7.03	2.53				
Zirconium Zr				37	23	10	13	4				

Table H 3-A-3
Scenario 3**Solute Loadings in DSolute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter												
TDS				1300322	697522	299220	436673	153011				
TSS				30001	26945	11589	17259	6024				
Free CN				0.98								
Total CN				24	9	4	5	2				
WAD CN				1.31								
CNO				1077								
SCN				49	24	9	12	4				
Sulphate				65965	35656	14686	19545	6776				
Chloride				628689	376026	154662	212713	75121				
Total Ammonia				274	267	33	43	15				
Nitrate				2952	1702	697	961	337				
Nitrite				225	45	27	10	4				
Alkalinity				224269	127428	56526	71400	24887				
OrthoPhosphate-P				80	43	18	25	9				
Phosphate-P				195	121	62	71	25				
Org. Carbon				40952	23797	14519	12600	4400				
Hardness CaCO3				379716	218247	90921	120414	41950				
Total Metals												
Aluminum Al				267	283	158	183	64				
Antimony Sb				9.1	7.5	7.0	3.4	1.2				
Arsenic As				4.9	2.6	1.0	1.3	0.5				
Barium Ba				26	17	7	9	3				
Beryllium Be				0.33	0.18	0.08	0.11	0.04				
Bismuth Bi				6.45	3.77	1.63	2.27	0.83				
Boron B				262	109	47	58	20				
Cadmium Cd				0.05	0.03	0.01	0.01	0.01				
Calcium Ca				182881	96201	38181	48879	16801				
Chromium Cr				8	3	2	1	1				
Cobalt Co				5.47	3.20	2.69	1.52	0.52				
Copper Cu				13	9	3	5	2				
Iron Fe				393	573	166	226	79				
Lead Pb				0.35	0.40	0.12	0.15	0.05				
Lithium Li				22	14	6	7	3				
Magnesium Mg				57003	31733	13457	16940	5913				
Manganese Mn				62	100	28	28	10				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				5.54	2.90	1.20	1.51	0.52				
Nickel Ni				7.04	4.68	1.72	2.17	0.75				
Phosphorus P				241	145	72	84	30				
Potassium K				40505	20981	8489	10824	3735				
Selenium Se				6.70	2.69	1.22	1.42	0.49				
Silicon SiO2				5567	3268	1354	1749	608				
Silver Ag				0.06	0.04	0.02	0.02	0.01				
Sodium Na				305334	159620	69457	83643	29161				
Strontium Sr				335	210	76	108	38				
Tellurium Te				371	231	97	125	44				
Thallium Tl				0.24	0.15	0.06	0.08	0.03				
Thorium Th				0.02	0.01	0.01	0.01	0.00				
Tin Sn				3.88	2.37	1.01	1.32	0.47				
Titanium Ti				45	28	12	15	5				
Uranium U				0.21	0.15	0.08	0.09	0.03				
Vanadium V				5.60	1.12	0.83	0.86	0.31				
Zinc Zn				17.88	19.95	7.65	7.13	2.48				
Zirconium Zr				38	23	10	13	4				

Table H 3-A-3
Scenario 3**Solute Loadings in D**
Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)

Date	Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter												
TDS				1316091	745342	336198	512442	188653				
TSS				29982	27023	11637	17334	6054				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				34	17	6	8	3				
Sulphate				56656	29974	12240	16246	5592				
Chloride				672180	418703	181111	262564	97524				
Total Ammonia				88	55	34	40	14				
Nitrate				2559	1376	550	731	254				
Nitrite				86	12	5	7	2				
Alkalinity				219552	124925	55549	70173	24476				
OrthoPhosphate-P				96	47	18	24	8				
Phosphate-P				211	125	63	70	24				
Org. Carbon				41238	23954	14584	12693	4433				
Hardness CaCO3				368526	212290	88579	117438	40947				
Total Metals												
Aluminum Al				266	289	162	189	66				
Antimony Sb				10.8	7.7	6.9	3.1	1.1				
Arsenic As				4.6	2.4	0.9	1.2	0.4				
Barium Ba				25	16	6	9	3				
Beryllium Be				0.36	0.19	0.07	0.10	0.03				
Bismuth Bi				8.14	4.00	1.54	2.02	0.69				
Boron B				262	109	47	59	21				
Cadmium Cd				0.05	0.03	0.01	0.01	0.00				
Calcium Ca				148759	80827	33292	44379	15911				
Chromium Cr				7	2	1	1	0				
Cobalt Co				4.16	2.48	2.39	1.13	0.39				
Copper Cu				12	9	3	5	2				
Iron Fe				392	580	169	232	81				
Lead Pb				0.34	0.38	0.11	0.15	0.05				
Lithium Li				22	14	6	7	3				
Magnesium Mg				56558	31527	13378	16842	5879				
Manganese Mn				58	98	27	27	9				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				4.30	2.24	0.94	1.17	0.40				
Nickel Ni				6.26	4.20	1.51	1.90	0.65				
Phosphorus P				251	145	70	80	28				
Potassium K				34847	18029	7329	9333	3229				
Selenium Se				6.69	2.71	1.24	1.44	0.50				
Silicon SiO2				5157	3062	1274	1648	574				
Silver Ag				0.07	0.04	0.02	0.02	0.01				
Sodium Na				300688	174807	82729	111256	42294				
Strontium Sr				326	206	75	106	37				
Tellurium Te				373	232	98	126	44				
Thallium Tl				0.24	0.15	0.06	0.08	0.03				
Thorium Th				0.02	0.02	0.01	0.01	0.00				
Tin Sn				4.15	2.41	1.00	1.29	0.45				
Titanium Ti				45	29	12	16	5				
Uranium U				0.21	0.16	0.08	0.09	0.03				
Vanadium V				5.72	1.15	0.82	0.85	0.29				
Zinc Zn				15.46	18.57	7.08	6.38	2.22				
Zirconium Zr				38	23	10	13	4				

Table H 3-A-3
Scenario 3**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter												
TDS				1649633	844341	350162	477954	165786				
TSS				30237	27156	11690	17323	6050				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				23	11	4	5	2				
Sulphate				45483	23970	9841	12218	4223				
Chloride				861833	471715	186704	236436	81855				
Total Ammonia				61	59	34	40	14				
Nitrate				1785	934	377	442	155				
Nitrite				19	13	6	7	2				
Alkalinity				216162	123072	54813	68410	23877				
OrthoPhosphate-P				67	32	12	14	5				
Phosphate-P				184	111	57	60	21				
Org. Carbon				41509	24095	14641	12662	4422				
Hardness CaCO3				360257	207793	86790	113734	39688				
Total Metals												
Aluminum Al				285	299	166	191	67				
Antimony Sb				8.2	6.3	6.3	2.2	0.8				
Arsenic As				4.4	2.3	0.9	1.1	0.4				
Barium Ba				24	16	6	8	3				
Beryllium Be				0.30	0.15	0.06	0.07	0.02				
Bismuth Bi				5.64	2.65	1.00	1.13	0.39				
Boron B				263	109	47	58	20				
Cadmium Cd				0.04	0.02	0.01	0.01	0.00				
Calcium Ca				146558	74925	29424	34556	11916				
Chromium Cr				6	2	1	1	0				
Cobalt Co				2.99	1.85	2.14	0.71	0.24				
Copper Cu				11	8	3	4	1				
Iron Fe				412	590	174	234	82				
Lead Pb				0.30	0.36	0.11	0.13	0.04				
Lithium Li				22	14	6	7	3				
Magnesium Mg				56154	31303	13288	16560	5783				
Manganese Mn				55	97	27	26	9				
Mercury Hg				0.01	0.01	0.00	0.00	0.00				
Molybdenum Mo				3.33	1.72	0.73	0.82	0.28				
Nickel Ni				5.30	3.69	1.31	1.54	0.53				
Phosphorus P				212	125	62	66	23				
Potassium K				30661	15779	6430	7776	2700				
Selenium Se				6.77	2.76	1.25	1.45	0.51				
Silicon SiO2				4871	2908	1212	1516	529				
Silver Ag				0.06	0.04	0.02	0.02	0.01				
Sodium Na				439549	222767	93396	109606	38034				
Strontium Sr				320	202	73	103	36				
Tellurium Te				376	233	98	125	44				
Thallium Tl				0.24	0.15	0.06	0.08	0.03				
Thorium Th				0.03	0.02	0.01	0.01	0.00				
Tin Sn				3.79	2.22	0.92	1.15	0.40				
Titanium Ti				47	29	12	16	6				
Uranium U				0.22	0.16	0.08	0.09	0.03				
Vanadium V				5.42	0.99	0.76	0.70	0.24				
Zinc Zn				13.07	17.28	6.56	5.46	1.91				
Zirconium Zr				38	24	10	13	4				

Table H 3-A-3
Scenario 3**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter												
TDS				1348988	706899	298900	433395	148496				
TSS				30130	27104	11670	17381	6056				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				12	6	2	3	1				
Sulphate				33344	18395	7756	10360	3510				
Chloride				663314	380959	152853	207156	70462				
Total Ammonia				38	44	28	33	12				
Nitrate				741	423	180	248	83				
Nitrite				15	11	4	5	2				
Alkalinity				210537	120486	53843	67953	23617				
OrthoPhosphate-P				37	18	7	9	3				
Phosphate-P				154	98	52	56	19				
Org. Carbon				41323	24005	14607	12727	4427				
Hardness CaCO3				348734	202509	84813	112518	39109				
Total Metals												
Aluminum Al				284	298	166	193	67				
Antimony Sb				5.5	5.1	5.9	1.8	0.6				
Arsenic As				3.9	2.1	0.8	1.0	0.4				
Barium Ba				22	15	6	8	3				
Beryllium Be				0.19	0.10	0.04	0.05	0.02				
Bismuth Bi				2.99	1.44	0.55	0.72	0.23				
Boron B				259	108	47	58	20				
Cadmium Cd				0.03	0.02	0.01	0.01	0.00				
Calcium Ca				105469	56097	22395	28301	9516				
Chromium Cr				6	2	1	1	0				
Cobalt Co				1.70	1.26	1.92	0.51	0.17				
Copper Cu				10	8	3	4	1				
Iron Fe				415	591	174	238	83				
Lead Pb				0.22	0.32	0.09	0.11	0.04				
Lithium Li				22	14	6	7	3				
Magnesium Mg				55187	30852	13118	16507	5742				
Manganese Mn				52	95	26	26	9				
Mercury Hg				0.01	0.01	0.00	0.00	0.00				
Molybdenum Mo				2.29	1.24	0.56	0.67	0.22				
Nickel Ni				4.20	3.18	1.12	1.38	0.47				
Phosphorus P				167	103	54	59	20				
Potassium K				25994	13643	5633	7107	2435				
Selenium Se				6.74	2.74	1.25	1.45	0.51				
Silicon SiO2				4401	2683	1127	1456	502				
Silver Ag				0.04	0.03	0.01	0.02	0.01				
Sodium Na				368595	190314	81290	99399	34005				
Strontium Sr				311	198	72	102	36				
Tellurium Te				374	232	98	126	44				
Thallium Tl				0.23	0.14	0.06	0.08	0.03				
Thorium Th				0.02	0.01	0.01	0.01	0.00				
Tin Sn				3.37	2.02	0.85	1.09	0.38				
Titanium Ti				47	29	12	16	6				
Uranium U				0.21	0.15	0.08	0.09	0.03				
Vanadium V				4.91	0.75	0.67	0.64	0.22				
Zinc Zn				10.20	15.95	6.06	5.04	1.75				
Zirconium Zr				38	23	10	13	4				

Table H 3-A-3
Scenario 3**Solute Loadings in DSolute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter												
TDS				1208037	640342	273705	392674	136850				
TSS				30133	27107	11671	17303	6043				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				7	3	1	1	0				
Sulphate				27718	15715	6735	8744	3042				
Chloride				570344	337059	136236	180144	62754				
Total Ammonia				38	36	26	31	11				
Nitrate				329	160	62	71	24				
Nitrite				15	9	4	5	2				
Alkalinity				208170	119375	53425	66867	23353				
OrthoPhosphate-P				23	12	5	5	2				
Phosphate-P				140	91	50	52	18				
Org. Carbon				41302	23998	14604	12622	4409				
Hardness CaCO3				343689	200134	83917	110534	38602				
Total Metals												
Aluminum Al				288	299	166	190	67				
Antimony Sb				4.2	4.5	5.6	1.4	0.5				
Arsenic As				3.8	2.0	0.8	1.0	0.3				
Barium Ba				22	15	6	8	3				
Beryllium Be				0.15	0.07	0.03	0.04	0.01				
Bismuth Bi				1.74	0.84	0.32	0.37	0.13				
Boron B				259	107	47	57	20				
Cadmium Cd				0.03	0.02	0.01	0.01	0.00				
Calcium Ca				86269	46990	18936	22838	7936				
Chromium Cr				5	1	1	1	0				
Cobalt Co				1.11	0.97	1.81	0.34	0.12				
Copper Cu				10	7	3	4	1				
Iron Fe				420	593	175	236	83				
Lead Pb				0.20	0.31	0.08	0.10	0.04				
Lithium Li				22	13	6	7	3				
Magnesium Mg				54818	30676	13051	16295	5692				
Manganese Mn				51	95	26	25	9				
Mercury Hg				0.01	0.01	0.00	0.00	0.00				
Molybdenum Mo				1.80	1.01	0.47	0.53	0.18				
Nickel Ni				3.71	2.94	1.03	1.23	0.43				
Phosphorus P				147	93	50	53	18				
Potassium K				23827	12620	5245	6454	2251				
Selenium Se				6.76	2.74	1.25	1.44	0.50				
Silicon SiO2				4222	2591	1090	1377	481				
Silver Ag				0.04	0.03	0.01	0.01	0.00				
Sodium Na				335557	174720	75387	89521	31218				
Strontium Sr				307	196	71	100	35				
Tellurium Te				374	232	98	125	44				
Thallium Tl				0.23	0.14	0.06	0.08	0.03				
Thorium Th				0.02	0.01	0.01	0.01	0.00				
Tin Sn				3.18	1.93	0.81	1.03	0.36				
Titanium Ti				47	29	12	16	6				
Uranium U				0.21	0.15	0.08	0.08	0.03				
Vanadium V				4.72	0.65	0.63	0.55	0.19				
Zinc Zn				8.93	15.33	5.82	4.63	1.63				
Zirconium Zr				38	23	10	13	4				

Table H 3-A-3
Scenario 3**Solute Loadings in DSolute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter												
TDS				1131301	604436	260169	377448	131677				
TSS				30150	27116	11675	17306	6044				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				4	2	1	1	0				
Sulphate				24580	14245	6181	8121	2831				
Chloride				519760	313389	127314	170108	59344				
Total Ammonia				36	36	26	31	11				
Nitrate				43	27	12	15	5				
Nitrite				14	9	4	5	2				
Alkalinity				206962	118815	53216	66627	23272				
OrthoPhosphate-P				15	8	3	4	1				
Phosphate-P				133	88	48	50	18				
Org. Carbon				41310	24003	14607	12623	4409				
Hardness CaCO3				341047	198903	83456	110009	38424				
Total Metals												
Aluminum Al				289	300	166	191	67				
Antimony Sb				3.5	4.1	5.5	1.3	0.5				
Arsenic As				3.7	1.9	0.7	0.9	0.3				
Barium Ba				21	15	6	8	3				
Beryllium Be				0.12	0.06	0.03	0.03	0.01				
Bismuth Bi				1.05	0.52	0.20	0.24	0.08				
Boron B				258	107	46	57	20				
Cadmium Cd				0.02	0.01	0.01	0.01	0.00				
Calcium Ca				75673	42030	17066	20736	7222				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.78	0.82	1.75	0.27	0.09				
Copper Cu				9	7	3	4	1				
Iron Fe				422	594	175	236	83				
Lead Pb				0.17	0.30	0.08	0.10	0.03				
Lithium Li				22	13	6	7	3				
Magnesium Mg				54625	30587	13018	16256	5679				
Manganese Mn				50	94	26	25	9				
Mercury Hg				0.01	0.01	0.00	0.00	0.00				
Molybdenum Mo				1.53	0.89	0.42	0.48	0.17				
Nickel Ni				3.43	2.81	0.98	1.17	0.41				
Phosphorus P				135	88	48	50	18				
Potassium K				22650	12069	5038	6221	2172				
Selenium Se				6.76	2.74	1.25	1.44	0.50				
Silicon SiO2				4106	2537	1070	1354	473				
Silver Ag				0.04	0.02	0.01	0.01	0.00				
Sodium Na				317634	166338	72228	85964	30010				
Strontium Sr				305	195	71	100	35				
Tellurium Te				374	232	98	125	44				
Thallium Tl				0.23	0.14	0.06	0.08	0.03				
Thorium Th				0.02	0.01	0.00	0.01	0.00				
Tin Sn				3.07	1.88	0.79	1.01	0.35				
Titanium Ti				47	30	12	16	6				
Uranium U				0.20	0.15	0.08	0.08	0.03				
Vanadium V				4.59	0.59	0.61	0.53	0.19				
Zinc Zn				8.20	14.99	5.69	4.49	1.58				
Zirconium Zr				38	23	10	13	4				

Table H 3-A-3
Scenario 3**Solute Loadings in D**
Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)

Date	Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter												
TDS				1084533	583016	252171	371986	129241				
TSS				30085	27083	11662	17371	6053				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				2	1	0	0	0				
Sulphate				22703	13388	5861	7867	2727				
Chloride				488787	299202	122015	166630	57754				
Total Ammonia				36	36	26	31	11				
Nitrate				43	27	12	15	5				
Nitrite				14	9	4	5	2				
Alkalinity				205842	118288	53015	66865	23276				
OrthoPhosphate-P				11	6	2	3	1				
Phosphate-P				128	85	47	50	17				
Org. Carbon				41221	23958	14589	12704	4420				
Hardness CaCO3				338932	197919	83082	110244	38396				
Total Metals												
Aluminum Al				287	298	166	193	67				
Antimony Sb				3.1	3.9	5.4	1.2	0.4				
Arsenic As				3.6	1.9	0.7	0.9	0.3				
Barium Ba				21	14	6	8	3				
Beryllium Be				0.10	0.05	0.02	0.03	0.01				
Bismuth Bi				0.64	0.34	0.13	0.17	0.06				
Boron B				257	107	46	57	20				
Cadmium Cd				0.02	0.01	0.00	0.01	0.00				
Calcium Ca				69344	39137	15987	19874	6871				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.58	0.73	1.72	0.25	0.08				
Copper Cu				9	7	3	4	1				
Iron Fe				421	593	175	239	83				
Lead Pb				0.16	0.29	0.08	0.10	0.03				
Lithium Li				22	13	6	7	3				
Magnesium Mg				54411	30485	12979	16323	5684				
Manganese Mn				49	94	25	25	9				
Mercury Hg				0.01	0.01	0.00	0.00	0.00				
Molybdenum Mo				1.37	0.81	0.39	0.46	0.16				
Nickel Ni				3.26	2.73	0.95	1.15	0.40				
Phosphorus P				128	85	47	49	17				
Potassium K				21908	11728	4910	6157	2137				
Selenium Se				6.74	2.74	1.24	1.45	0.50				
Silicon SiO2				4018	2496	1054	1360	472				
Silver Ag				0.03	0.02	0.01	0.01	0.00				
Sodium Na				306393	161176	70299	84955	29476				
Strontium Sr				303	194	70	100	35				
Tellurium Te				373	232	98	126	44				
Thallium Tl				0.23	0.14	0.06	0.08	0.03				
Thorium Th				0.01	0.01	0.00	0.01	0.00				
Tin Sn				3.01	1.85	0.78	1.00	0.35				
Titanium Ti				47	29	12	16	6				
Uranium U				0.20	0.15	0.08	0.08	0.03				
Vanadium V				4.50	0.55	0.59	0.54	0.18				
Zinc Zn				7.72	14.77	5.61	4.45	1.56				
Zirconium Zr				37	23	10	13	4				

Table H 3-A-3
Scenario 3**Solute Loadings in DSolute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16	Year 10 Jan-17
Parameter												
TDS				1063722	573231	248476	364428	127259				
TSS				30108	27096	11667	17298	6042				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				1	0	0	0	0				
Sulphate				21843	12983	5708	7594	2652				
Chloride				475104	292769	119586	161504	56424				
Total Ammonia				36	36	26	31	11				
Nitrate				43	27	12	15	5				
Nitrite				14	9	4	5	2				
Alkalinity				205608	118185	52978	66365	23183				
OrthoPhosphate-P				9	5	2	2	1				
Phosphate-P				126	84	47	49	17				
Org. Carbon				41246	23972	14595	12611	4405				
Hardness CaCO3				338340	197648	82983	109487	38247				
Total Metals												
Aluminum Al				288	299	166	190	67				
Antimony Sb				2.9	3.9	5.4	1.2	0.4				
Arsenic As				3.6	1.9	0.7	0.9	0.3				
Barium Ba				21	14	6	8	3				
Beryllium Be				0.09	0.05	0.02	0.02	0.01				
Bismuth Bi				0.45	0.25	0.10	0.12	0.04				
Boron B				257	107	46	57	20				
Cadmium Cd				0.02	0.01	0.00	0.01	0.00				
Calcium Ca				66440	37768	15469	18957	6618				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.49	0.69	1.70	0.22	0.08				
Copper Cu				9	7	3	4	1				
Iron Fe				422	594	175	236	83				
Lead Pb				0.15	0.29	0.08	0.09	0.03				
Lithium Li				22	13	6	7	3				
Magnesium Mg				54382	30474	12975	16209	5663				
Manganese Mn				49	94	25	25	9				
Mercury Hg				0.01	0.01	0.00	0.00	0.00				
Molybdenum Mo				1.30	0.78	0.38	0.43	0.15				
Nickel Ni				3.18	2.70	0.94	1.12	0.39				
Phosphorus P				125	83	46	48	17				
Potassium K				21594	11582	4855	6017	2103				
Selenium Se				6.75	2.74	1.25	1.43	0.50				
Silicon SiO2				3991	2484	1050	1332	466				
Silver Ag				0.03	0.02	0.01	0.01	0.00				
Sodium Na				301610	158935	69453	82877	28962				
Strontium Sr				302	194	70	100	35				
Tellurium Te				373	232	98	125	44				
Thallium Tl				0.22	0.14	0.06	0.08	0.03				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				2.98	1.84	0.78	0.99	0.35				
Titanium Ti				47	30	12	16	6				
Uranium U				0.20	0.15	0.08	0.08	0.03				
Vanadium V				4.47	0.54	0.59	0.50	0.18				
Zinc Zn				7.53	14.68	5.58	4.36	1.54				
Zirconium Zr				37	23	10	13	4				

Table H-3-A-1
Scenario 3

OUTPUT SUMMARY							Fraction of CCME in Doris Creek (%)
Discharge rate		1000000 m3/year					
Degradation Field(age)		Tail Lk Cu < CME Year		8			
		MMER	CCME	Tail Lake Year 2	Doris Creek Year 3	L'Roberts L Year 3	Creek (%)
Maximum Concentration							
pH			6 to 9	7 to 8	7 to 8	7 to 8	4%
TDS		mg/L		1583	216	199	
TSS		mg/L		3.7	6.8	8.1	
Free CN		mg/L	0.005	0.0036	0.00020	0.00010	
Total CN		mg/L	1.0	0.035	0.004	0.003	
WAD CN		mg/L		0.0048	0.0003	0.0001	
CNO		mg/L		4.0	0.22	0.12	
SCN		mg/L		0.118	0.006	0.003	
Sulphate		mg/L		109	8.7	7.1	
Chloride		mg/L		1051	113	91	
Total Ammonia		mg/L	0.97	1.31	0.084	0.045	9%
Nitrate		mg/L	2.9	6.8	0.39	0.20	13%
Nitrite		mg/L	0.018	0.53	0.032	0.018	175%
Alkalinity		mg/L		64	29	27	
OrthoPhosphate-P		mg/L		0.2149	0.0126	0.0071	
Phosphate-P		mg/L		0.2183	0.0315	0.0302	
Org. Carbon		mg/L		4.8	7.3	7.1	
Hardness CaCO3		mg/L		127	50	47	
Total Metals							
Aluminum Al		mg/L	0.1	0.14	0.08	0.25	83%
Antimony Sb		mg/L		0.0194	0.0035	0.0021	
Arsenic As		mg/L	0.5	0.00	0.0006	0.0006	13%
Barium Ba		mg/L		0.0125	0.0035	0.0054	
Beryllium Be		mg/L		0.00071	0.00005	0.00003	
Bismuth Bi		mg/L		0.01877	0.00107	0.00064	
Boron B		mg/L		0.034	0.034	0.030	
Cadmium Cd		mg/L	0.000038	0.000066	0.0000067	0.0000164	18%
Calcium Ca		mg/L		295	24	16	
Chromium Cr		mg/L	0.001	0.0078	0.001	0.001	103%
Cobalt Co		mg/L		0.0123	0.0013	0.0006	
Copper Cu		mg/L	0.3	0.011	0.0019	0.0021	97%
Iron Fe		mg/L	0.3	0.15	0.13	0.28	42%
Lead Pb		mg/L	0.2	0.00047	0.00008	0.00027	4%
Lithium Li		mg/L		0.0055	0.0029	0.0029	
Magnesium Mg		mg/L		10.6	7.5	7.4	
Manganese Mn		mg/L		0.034	0.021	0.025	
Mercury Hg		mg/L	0.0001	0.0000107	0.0000012	0.0000009	1%
Molybdenum Mo		mg/L		0.073	0.00073	0.00048	1%
Nickel Ni		mg/L	0.5	0.010	0.0010	0.0009	4%
Phosphorus P		mg/L		0.305	0.036	0.033	
Potassium K		mg/L		49	5.3	4.1	
Selenium Se		mg/L	0.001	0.00081	0.00089	0.00084	89%
Silicon SiO2		mg/L		4.6	0.73	0.63	
Silver Ag		mg/L	0.0001	0.00013	0.0000088	0.0000073	9%
Sodium Na		mg/L		386	58	48	
Strontium Sr		mg/L		0.104	0.044	0.048	
Tellurium Te		mg/L		0.039	0.049	0.051	
Thallium Tl		mg/L	0.0008	0.000048	0.000031	0.002001	4%
Thorium Th		mg/L		0.000057	0.0000044	0.0000023	
Tin Sn		mg/L		0.00296	0.00054	0.00009	
Titanium Ti		mg/L		0.0115	0.0063	0.0063	
Uranium U		mg/L		0.000081	0.000042	0.000045	
Vanadium V		mg/L		0.0041	0.0007	0.0005	
Zinc Zn		mg/L	0.5	0.027	0.0042	0.0057	14%
Zirconium Zr		mg/L		0.0045	0.0050	0.0051	

Table H-3-A-2
Scenario 3

Water Quality in Little Roberst Lake Outflow

Date		Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter													
TDS	mg/L				155	155	146	167	168				
TSS	mg/L				7.0	8.1	4.1	5.1	5.1				
Free CN	mg/L				0.00004	0.00001	0.00001	0.00001	0.00001				
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L				0.0001	0.0000	0.0000	0.0000	0.0000				
CNO	mg/L				0.05	0.01	0.01	0.02	0.02				
SCN	mg/L				0.001	0.001	0.001	0.001	0.001				
Sulphate	mg/L				4.3	4.4	5.5	5.5	5.7				
Chloride	mg/L				63	61	60	69	70				
Total Ammonia	mg/L				0.012	0.024	0.005	0.016	0.016				
Nitrate	mg/L				0.04	0.06	0.07	0.10	0.11				
Nitrite	mg/L				0.007	0.008	0.006	0.004	0.009				
Alkalinity	mg/L				24	24	25	26	26				
OrthoPhosphate-P	mg/L				0.0018	0.0019	0.0021	0.0024	0.0027				
Phosphate-P	mg/L				0.0249	0.0170	0.0082	0.0205	0.0208				
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1				
Hardness CaCO3	mg/L				44	39	41	46	46				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0005	0.0018	0.0013	0.0008	0.0008				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0005	0.0005				
Barium Ba	mg/L				0.0052	0.0035	0.0045	0.0043	0.0043				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00002				
Bismuth Bi	mg/L				0.00015	0.00019	0.00023	0.00026	0.00029				
Boron B	mg/L				0.030	0.020	0.029	0.027	0.027				
Cadmium Cd	mg/L				0.0000031	0.0000048	0.0000155	0.0000031	0.0000032				
Calcium Ca	mg/L				9	8	9	10	11				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0004	0.0004	0.0002	0.0002				
Copper Cu	mg/L				0.0012	0.0014	0.0017	0.0020	0.0020				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00010	0.00026	0.00026				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.1	5.1	5.3	7.2	7.3				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00024	0.00023	0.00031	0.00029	0.00031				
Nickel Ni	mg/L				0.0007	0.0006	0.0007	0.0007	0.0007				
Phosphorus P	mg/L				0.026	0.018	0.009	0.022	0.022				
Potassium K	mg/L				3.0	2.5	2.5	2.9	3.0				
Selenium Se	mg/L				0.00065	0.00037	0.00083	0.00060	0.00060				
Silicon SiO2	mg/L				0.54	0.54	0.55	0.56	0.56				
Silver Ag	mg/L				0.0000053	0.0000030	0.0000057	0.0000042	0.0000043				
Sodium Na	mg/L				38	32	34	37	37				
Strontium Sr	mg/L				0.045	0.038	0.040	0.046	0.047				
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051				
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00001	0.00002	0.00002	0.00003	0.00003				
Titanium Ti	mg/L				0.0061	0.0061	0.0061	0.0061	0.0061				
Uranium U	mg/L				0.000037	0.000033	0.000036	0.000044	0.000044				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0036	0.0018	0.0017	0.0054	0.0054				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-3-A-2
Scenario 3

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter													
TDS	mg/L				164	163	153	174	175				
TSS	mg/L				7.1	8.1	4.1	5.1	5.1				
Free CN	mg/L				0.00010		0.00001	0.00001	0.00001				
Total CN	mg/L				0.003	0.002	0.002	0.002	0.002				
WAD CN	mg/L				0.0001		0.0000	0.0000	0.0000				
CNO	mg/L				0.12		0.02	0.02	0.02				
SCN	mg/L				0.003	0.002	0.002	0.003	0.003				
Sulphate	mg/L				6.2	5.8	6.8	6.8	7.0				
Chloride	mg/L				70	66	65	74	75				
Total Ammonia	mg/L				0.025	0.045	0.002	0.017	0.016				
Nitrate	mg/L				0.15	0.16	0.16	0.19	0.20				
Nitrite	mg/L				0.018	0.007	0.006	0.004	0.009				
Alkalinity	mg/L				24	24	25	27	27				
OrthoPhosphate-P	mg/L				0.0044	0.0039	0.0040	0.0043	0.0045				
Phosphate-P	mg/L				0.0275	0.0190	0.0101	0.0224	0.0226				
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1				
Hardness CaCO3	mg/L				46	41	43	47	47				
Total Metals													
Aluminum Al	mg/L				0.24	0.12	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0007	0.0020	0.0015	0.0010	0.0010				
Arsenic As	mg/L				0.0005	0.0004	0.0006	0.0005	0.0005				
Barium Ba	mg/L				0.0054	0.0036	0.0047	0.0044	0.0044				
Beryllium Be	mg/L				0.00002	0.00002	0.00002	0.00002	0.00002				
Bismuth Bi	mg/L				0.00038	0.00037	0.00039	0.00043	0.00045				
Boron B	mg/L				0.030	0.021	0.029	0.027	0.027				
Cadmium Cd	mg/L				0.0000042	0.0000057	0.0000163	0.0000039	0.0000040				
Calcium Ca	mg/L				14	12	12	14	14				
Chromium Cr	mg/L				0.001	0.000	0.001	0.001	0.001				
Cobalt Co	mg/L				0.0004	0.0005	0.0006	0.0004	0.0004				
Copper Cu	mg/L				0.0014	0.0015	0.0018	0.0021	0.0021				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00008	0.00006	0.00010	0.00026	0.00026				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.2	5.2	5.4	7.3	7.4				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.009				
Mercury Hg	mg/L				0.0000008	0.0000008	0.0000008	0.0000008	0.0000008				
Molybdenum Mo	mg/L				0.00042	0.00037	0.00044	0.00043	0.00044				
Nickel Ni	mg/L				0.0009	0.0007	0.0008	0.0008	0.0008				
Phosphorus P	mg/L				0.030	0.021	0.012	0.025	0.025				
Potassium K	mg/L				3.8	3.1	3.1	3.5	3.6				
Selenium Se	mg/L				0.00065	0.00038	0.00084	0.00061	0.00061				
Silicon SiO2	mg/L				0.61	0.60	0.60	0.61	0.62				
Silver Ag	mg/L				0.0000064	0.0000039	0.0000064	0.0000050	0.0000051				
Sodium Na	mg/L				39	32	35	37	37				
Strontium Sr	mg/L				0.046	0.039	0.041	0.048	0.048				
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051				
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000002				
Tin Sn	mg/L				0.00004	0.00004	0.00005	0.00005	0.00006				
Titanium Ti	mg/L				0.0061	0.0061	0.0061	0.0061	0.0061				
Uranium U	mg/L				0.000037	0.000033	0.000036	0.000044	0.000044				
Vanadium V	mg/L				0.0005	0.0002	0.0005	0.0004	0.0004				
Zinc Zn	mg/L				0.0041	0.0022	0.0021	0.0057	0.0057				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-3-A-2
Scenario 3

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter													
TDS	mg/L				170	167	157	178	178				
TSS	mg/L				7.1	8.1	4.1	5.1	5.1				
Free CN	mg/L				0.00007								
Total CN	mg/L				0.003	0.002	0.002	0.002	0.002				
WAD CN	mg/L				0.0001								
CNO	mg/L				0.07								
SCN	mg/L				0.003	0.003	0.002	0.003	0.002				
Sulphate	mg/L				6.9	6.3	7.1	6.9	6.9				
Chloride	mg/L				74	70	69	78	78				
Total Ammonia	mg/L				0.021	0.030	0.002	0.009	0.010				
Nitrate	mg/L				0.20	0.19	0.18	0.20	0.20				
Nitrite	mg/L				0.016	0.006	0.006	0.003	0.003				
Alkalinity	mg/L				25	25	25	27	27				
OrthoPhosphate-P	mg/L				0.0061	0.0054	0.0053	0.0057	0.0059				
Phosphate-P	mg/L				0.0292	0.0205	0.0114	0.0238	0.0240				
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1				
Hardness CaCO3	mg/L				47	41	43	47	47				
Total Metals													
Aluminum Al	mg/L				0.24	0.12	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0009	0.0021	0.0016	0.0011	0.0011				
Arsenic As	mg/L				0.0005	0.0004	0.0006	0.0005	0.0005				
Barium Ba	mg/L				0.0054	0.0037	0.0047	0.0044	0.0044				
Beryllium Be	mg/L				0.00003	0.00002	0.00002	0.00002	0.00002				
Bismuth Bi	mg/L				0.00052	0.00050	0.00051	0.00055	0.00057				
Boron B	mg/L				0.030	0.021	0.029	0.027	0.027				
Cadmium Cd	mg/L				0.0000047	0.0000059	0.0000164	0.0000039	0.0000039				
Calcium Ca	mg/L				16	13	13	14	14				
Chromium Cr	mg/L				0.001	0.000	0.001	0.001	0.001				
Cobalt Co	mg/L				0.0005	0.0006	0.0006	0.0004	0.0004				
Copper Cu	mg/L				0.0015	0.0016	0.0018	0.0021	0.0021				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00008	0.00006	0.00010	0.00026	0.00027				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.3	5.3	5.4	7.4	7.4				
Manganese Mn	mg/L				0.025	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000008	0.0000008	0.0000008	0.0000008	0.0000008				
Molybdenum Mo	mg/L				0.00048	0.00041	0.00046	0.00042	0.00042				
Nickel Ni	mg/L				0.0009	0.0007	0.0009	0.0008	0.0008				
Phosphorus P	mg/L				0.032	0.023	0.014	0.026	0.027				
Potassium K	mg/L				4.1	3.3	3.2	3.5	3.5				
Selenium Se	mg/L				0.00066	0.00038	0.00084	0.00061	0.00061				
Silicon SiO2	mg/L				0.63	0.61	0.61	0.61	0.61				
Silver Ag	mg/L				0.0000071	0.0000043	0.0000068	0.0000053	0.0000053				
Sodium Na	mg/L				39	32	35	37	37				
Strontium Sr	mg/L				0.047	0.039	0.041	0.048	0.048				
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051				
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000002	0.000002				
Tin Sn	mg/L				0.00007	0.00006	0.00007	0.00007	0.00007				
Titanium Ti	mg/L				0.0061	0.0061	0.0061	0.0061	0.0061				
Uranium U	mg/L				0.000037	0.000034	0.000036	0.000045	0.000045				
Vanadium V	mg/L				0.0005	0.0002	0.0005	0.0004	0.0004				
Zinc Zn	mg/L				0.0042	0.0023	0.0021	0.0057	0.0057				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-3-A-2
Scenario 3

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter													
TDS	mg/L				171	172	166	193	199				
TSS	mg/L				7.1	8.1	4.1	5.1	5.1				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.002	0.002	0.002	0.002	0.002				
Sulphate	mg/L				6.2	5.6	6.4	6.3	6.2				
Chloride	mg/L				77	74	75	88	91				
Total Ammonia	mg/L				0.009	0.007	0.002	0.009	0.009				
Nitrate	mg/L				0.18	0.15	0.14	0.15	0.15				
Nitrite	mg/L				0.007	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				24	24	25	26	26				
OrthoPhosphate-P	mg/L				0.0071	0.0058	0.0054	0.0055	0.0054				
Phosphate-P	mg/L				0.0302	0.0210	0.0116	0.0237	0.0236				
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1				
Hardness CaCO3	mg/L				46	40	42	46	46				
Total Metals													
Aluminum Al	mg/L				0.24	0.12	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0010	0.0021	0.0016	0.0010	0.0010				
Arsenic As	mg/L				0.0005	0.0004	0.0006	0.0005	0.0005				
Barium Ba	mg/L				0.0054	0.0036	0.0046	0.0044	0.0044				
Beryllium Be	mg/L				0.00003	0.00002	0.00002	0.00002	0.00002				
Bismuth Bi	mg/L				0.00064	0.00052	0.00049	0.00050	0.00049				
Boron B	mg/L				0.030	0.021	0.029	0.027	0.027				
Cadmium Cd	mg/L				0.0000043	0.0000056	0.0000161	0.0000037	0.0000037				
Calcium Ca	mg/L				14	12	12	13	13				
Chromium Cr	mg/L				0.001	0.000	0.001	0.001	0.001				
Cobalt Co	mg/L				0.0004	0.0005	0.0005	0.0003	0.0003				
Copper Cu	mg/L				0.0014	0.0015	0.0018	0.0020	0.0020				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00008	0.00006	0.00010	0.00026	0.00026				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.2	5.2	5.4	7.3	7.3				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000008	0.0000008	0.0000008	0.0000009	0.0000009				
Molybdenum Mo	mg/L				0.00039	0.00033	0.00039	0.00036	0.00035				
Nickel Ni	mg/L				0.0009	0.0007	0.0008	0.0007	0.0007				
Phosphorus P	mg/L				0.033	0.023	0.014	0.026	0.026				
Potassium K	mg/L				3.7	3.0	2.9	3.2	3.2				
Selenium Se	mg/L				0.00066	0.00038	0.00084	0.00061	0.00061				
Silicon SiO2	mg/L				0.61	0.59	0.59	0.59	0.59				
Silver Ag	mg/L				0.0000073	0.0000045	0.0000069	0.0000054	0.0000053				
Sodium Na	mg/L				39	34	38	43	45				
Strontium Sr	mg/L				0.046	0.039	0.041	0.047	0.047				
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051				
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00009	0.00007	0.00006	0.00007	0.00006				
Titanium Ti	mg/L				0.0061	0.0062	0.0062	0.0062	0.0062				
Uranium U	mg/L				0.000038	0.000034	0.000036	0.000045	0.000045				
Vanadium V	mg/L				0.0005	0.0002	0.0005	0.0004	0.0004				
Zinc Zn	mg/L				0.0041	0.0021	0.0020	0.0056	0.0056				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-3-A-2
Scenario 3

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter													
TDS	mg/L				194	183	170	186	186				
TSS	mg/L				7.1	8.1	4.1	5.1	5.1				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.002	0.001	0.001	0.001	0.001				
Sulphate	mg/L				5.5	5.0	5.8	5.5	5.4				
Chloride	mg/L				90	80	77	82	82				
Total Ammonia	mg/L				0.007	0.008	0.002	0.009	0.009				
Nitrate	mg/L				0.12	0.11	0.10	0.09	0.09				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				24	24	25	26	26				
OrthoPhosphate-P	mg/L				0.0052	0.0042	0.0038	0.0035	0.0034				
Phosphate-P	mg/L				0.0284	0.0194	0.0101	0.0217	0.0217				
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1				
Hardness CaCO3	mg/L				45	40	42	46	46				
Total Metals													
Aluminum Al	mg/L				0.25	0.12	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0008	0.0020	0.0014	0.0008	0.0008				
Arsenic As	mg/L				0.0005	0.0004	0.0006	0.0005	0.0005				
Barium Ba	mg/L				0.0053	0.0036	0.0046	0.0043	0.0043				
Beryllium Be	mg/L				0.00002	0.00002	0.00002	0.00002	0.00002				
Bismuth Bi	mg/L				0.00047	0.00038	0.00035	0.00031	0.00031				
Boron B	mg/L				0.030	0.021	0.029	0.027	0.027				
Cadmium Cd	mg/L				0.0000041	0.0000054	0.0000159	0.0000033	0.0000033				
Calcium Ca	mg/L				14	11	11	11	11				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0003	0.0004	0.0005	0.0002	0.0002				
Copper Cu	mg/L				0.0013	0.0014	0.0017	0.0020	0.0020				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00008	0.00006	0.00010	0.00026	0.00026				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.2	5.2	5.4	7.3	7.3				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000009	0.0000009	0.0000009	0.0000009	0.0000009				
Molybdenum Mo	mg/L				0.00033	0.00028	0.00034	0.00029	0.00028				
Nickel Ni	mg/L				0.0008	0.0006	0.0007	0.0007	0.0007				
Phosphorus P	mg/L				0.030	0.021	0.011	0.023	0.023				
Potassium K	mg/L				3.4	2.7	2.7	2.9	2.9				
Selenium Se	mg/L				0.00066	0.00039	0.00084	0.00061	0.00061				
Silicon SiO2	mg/L				0.59	0.57	0.57	0.56	0.56				
Silver Ag	mg/L				0.0000071	0.0000043	0.0000067	0.0000047	0.0000047				
Sodium Na	mg/L				48	39	41	43	42				
Strontium Sr	mg/L				0.046	0.039	0.041	0.047	0.047				
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051				
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00006	0.00005	0.00004	0.00004	0.00004				
Titanium Ti	mg/L				0.0062	0.0063	0.0063	0.0063	0.0063				
Uranium U	mg/L				0.000038	0.000034	0.000037	0.000045	0.000045				
Vanadium V	mg/L				0.0005	0.0002	0.0005	0.0004	0.0004				
Zinc Zn	mg/L				0.0039	0.0020	0.0018	0.0054	0.0054				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-3-A-2
Scenario 3

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter													
TDS	mg/L				173	168	157	177	176				
TSS	mg/L				7.1	8.1	4.1	5.1	5.1				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.001	0.001	0.001	0.001	0.001				
Sulphate	mg/L				4.7	4.4	5.3	5.1	5.0				
Chloride	mg/L				76	70	68	77	75				
Total Ammonia	mg/L				0.005	0.006	0.000	0.007	0.007				
Nitrate	mg/L				0.05	0.05	0.04	0.05	0.05				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				24	24	25	26	26				
OrthoPhosphate-P	mg/L				0.0032	0.0026	0.0025	0.0025	0.0024				
Phosphate-P	mg/L				0.0264	0.0179	0.0088	0.0209	0.0207				
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1				
Hardness CaCO3	mg/L				44	39	41	45	45				
Total Metals													
Aluminum Al	mg/L				0.25	0.12	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0006	0.0019	0.0013	0.0008	0.0007				
Arsenic As	mg/L				0.0005	0.0004	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0052	0.0035	0.0045	0.0043	0.0042				
Beryllium Be	mg/L				0.00002	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00029	0.00024	0.00023	0.00023	0.00022				
Boron B	mg/L				0.030	0.021	0.029	0.027	0.027				
Cadmium Cd	mg/L				0.0000033	0.0000047	0.0000153	0.0000028	0.0000028				
Calcium Ca	mg/L				11	9	9	10	9				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0004	0.0004	0.0002	0.0002				
Copper Cu	mg/L				0.0013	0.0014	0.0017	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00026	0.00026				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.1	5.2	5.4	7.3	7.3				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000008	0.0000009	0.0000009	0.0000009	0.0000009				
Molybdenum Mo	mg/L				0.00026	0.00023	0.00029	0.00025	0.00025				
Nickel Ni	mg/L				0.0007	0.0006	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.027	0.019	0.009	0.021	0.021				
Potassium K	mg/L				3.1	2.5	2.4	2.8	2.7				
Selenium Se	mg/L				0.00066	0.00039	0.00084	0.00062	0.00061				
Silicon SiO2	mg/L				0.55	0.55	0.55	0.55	0.55				
Silver Ag	mg/L				0.0000058	0.0000032	0.0000057	0.0000042	0.0000039				
Sodium Na	mg/L				43	36	38	40	40				
Strontium Sr	mg/L				0.045	0.038	0.040	0.046	0.046				
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051				
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001				
Thorium Th	mg/L				0.000001	0.000001	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00003	0.00003	0.00002	0.00003	0.00002				
Titanium Ti	mg/L				0.0062	0.0063	0.0063	0.0063	0.0063				
Uranium U	mg/L				0.000037	0.000033	0.000036	0.000044	0.000044				
Vanadium V	mg/L				0.0005	0.0002	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0037	0.0019	0.0017	0.0053	0.0053				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-3-A-2
Scenario 3

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter													
TDS	mg/L				164	161	150	169	169				
TSS	mg/L				7.1	8.1	4.1	5.1	5.1				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.000	0.000	0.000	0.000	0.000				
Sulphate	mg/L				4.3	4.1	5.0	4.8	4.8				
Chloride	mg/L				70	65	64	71	71				
Total Ammonia	mg/L				0.005	0.005	0.000	0.007	0.007				
Nitrate	mg/L				0.03	0.02	0.01	0.02	0.02				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				24	24	25	26	26				
OrthoPhosphate-P	mg/L				0.0022	0.0019	0.0018	0.0017	0.0017				
Phosphate-P	mg/L				0.0255	0.0172	0.0082	0.0200	0.0200				
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1				
Hardness CaCO3	mg/L				44	39	41	45	45				
Total Metals													
Aluminum Al	mg/L				0.25	0.12	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0005	0.0018	0.0012	0.0007	0.0007				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0052	0.0035	0.0045	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00020	0.00018	0.00017	0.00016	0.00016				
Boron B	mg/L				0.030	0.021	0.029	0.027	0.027				
Cadmium Cd	mg/L				0.0000031	0.0000045	0.0000150	0.0000025	0.0000025				
Calcium Ca	mg/L				9	8	8	9	8				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0014	0.0017	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.1	5.2	5.3	7.2	7.2				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000009	0.0000009	0.0000009	0.0000009	0.0000009				
Molybdenum Mo	mg/L				0.00023	0.00020	0.00027	0.00023	0.00022				
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.026	0.017	0.008	0.020	0.020				
Potassium K	mg/L				2.9	2.4	2.3	2.6	2.6				
Selenium Se	mg/L				0.00066	0.00039	0.00084	0.00061	0.00061				
Silicon SiO2	mg/L				0.54	0.54	0.54	0.54	0.54				
Silver Ag	mg/L				0.0000056	0.0000029	0.0000053	0.0000034	0.0000034				
Sodium Na	mg/L				41	34	36	38	38				
Strontium Sr	mg/L				0.045	0.038	0.040	0.046	0.046				
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051				
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00002	0.00002	0.00002	0.00001	0.00001				
Titanium Ti	mg/L				0.0063	0.0063	0.0063	0.0063	0.0063				
Uranium U	mg/L				0.000037	0.000033	0.000036	0.000044	0.000044				
Vanadium V	mg/L				0.0005	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0036	0.0018	0.0017	0.0052	0.0052				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-3-A-2
Scenario 3

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter													
TDS	mg/L				158	157	147	166	166				
TSS	mg/L				7.1	8.1	4.1	5.1	5.1				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.000	0.000	0.000	0.000	0.000				
Sulphate	mg/L				4.1	3.9	4.9	4.6	4.6				
Chloride	mg/L				67	63	62	69	69				
Total Ammonia	mg/L				0.005	0.005	0.000	0.007	0.007				
Nitrate	mg/L				0.01	0.01	0.00	0.01	0.01				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				24	24	25	26	26				
OrthoPhosphate-P	mg/L				0.0017	0.0015	0.0015	0.0014	0.0014				
Phosphate-P	mg/L				0.0250	0.0169	0.0078	0.0197	0.0197				
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1				
Hardness CaCO3	mg/L				44	39	41	45	45				
Total Metals													
Aluminum Al	mg/L				0.25	0.12	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0005	0.0018	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0035	0.0045	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00016	0.00014	0.00014	0.00013	0.00013				
Boron B	mg/L				0.030	0.021	0.029	0.027	0.027				
Cadmium Cd	mg/L				0.0000029	0.0000043	0.0000149	0.0000023	0.0000023				
Calcium Ca	mg/L				9	7	7	8	8				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.1	5.1	5.3	7.2	7.2				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000009	0.0000009	0.0000009	0.0000009	0.0000009				
Molybdenum Mo	mg/L				0.00021	0.00019	0.00026	0.00021	0.00021				
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.025	0.017	0.008	0.020	0.020				
Potassium K	mg/L				2.9	2.3	2.3	2.6	2.6				
Selenium Se	mg/L				0.00066	0.00039	0.00084	0.00061	0.00061				
Silicon SiO2	mg/L				0.53	0.53	0.53	0.53	0.53				
Silver Ag	mg/L				0.0000052	0.0000026	0.0000051	0.0000032	0.0000032				
Sodium Na	mg/L				40	33	35	38	38				
Strontium Sr	mg/L				0.045	0.038	0.040	0.046	0.046				
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051				
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Titanium Ti	mg/L				0.0063	0.0063	0.0063	0.0063	0.0063				
Uranium U	mg/L				0.000037	0.000033	0.000035	0.000044	0.000044				
Vanadium V	mg/L				0.0005	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0036	0.0018	0.0016	0.0052	0.0052				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-3-A-2
Scenario 3

Water Quality in Little Roberst Lake Outflow

Date		Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter													
TDS	mg/L				155	155	144	165	164				
TSS	mg/L				7.1	8.1	4.1	5.1	5.1				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.000	0.000	0.000	0.000	0.000				
Sulphate	mg/L				3.9	3.8	4.8	4.6	4.6				
Chloride	mg/L				65	61	60	68	68				
Total Ammonia	mg/L				0.005	0.005	0.000	0.007	0.007				
Nitrate	mg/L				0.01	0.01	0.00	0.01	0.01				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				24	24	25	26	26				
OrthoPhosphate-P	mg/L				0.0014	0.0013	0.0013	0.0013	0.0012				
Phosphate-P	mg/L				0.0247	0.0166	0.0076	0.0196	0.0196				
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1				
Hardness CaCO3	mg/L				44	39	41	45	45				
Total Metals													
Aluminum Al	mg/L				0.25	0.12	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0005	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0045	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00013	0.00012	0.00012	0.00012	0.00012				
Boron B	mg/L				0.030	0.021	0.029	0.027	0.027				
Cadmium Cd	mg/L				0.0000027	0.0000042	0.0000148	0.0000023	0.0000023				
Calcium Ca	mg/L				8	7	7	8	8				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.1	5.1	5.3	7.2	7.2				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000009	0.0000009	0.0000009	0.0000009	0.0000009				
Molybdenum Mo	mg/L				0.00020	0.00018	0.00025	0.00021	0.00021				
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.025	0.017	0.007	0.019	0.019				
Potassium K	mg/L				2.8	2.3	2.3	2.6	2.6				
Selenium Se	mg/L				0.00066	0.00039	0.00084	0.00061	0.00061				
Silicon SiO2	mg/L				0.53	0.53	0.53	0.53	0.53				
Silver Ag	mg/L				0.0000049	0.0000024	0.0000049	0.0000033	0.0000031				
Sodium Na	mg/L				39	32	35	38	37				
Strontium Sr	mg/L				0.045	0.038	0.040	0.046	0.046				
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051				
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Titanium Ti	mg/L				0.0063	0.0063	0.0063	0.0063	0.0063				
Uranium U	mg/L				0.000037	0.000033	0.000035	0.000044	0.000044				
Vanadium V	mg/L				0.0005	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0016	0.0052	0.0052				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-3-A-2
Scenario 3

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16
Parameter												
TDS	mg/L				154	154	143	163	163			
TSS	mg/L				7.1	8.1	4.1	5.1	5.1			
Free CN	mg/L											
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002			
WAD CN	mg/L											
CNO	mg/L											
SCN	mg/L				0.000	0.000	0.000	0.000	0.000			
Sulphate	mg/L				3.9	3.8	4.8	4.5	4.5			
Chloride	mg/L				64	60	59	67	67			
Total Ammonia	mg/L				0.005	0.005	0.000	0.007	0.007			
Nitrate	mg/L				0.01	0.01	0.00	0.01	0.01			
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002			
Alkalinity	mg/L				24	24	25	26	26			
OrthoPhosphate-P	mg/L				0.0012	0.0012	0.0012	0.0011	0.0011			
Phosphate-P	mg/L				0.0245	0.0165	0.0075	0.0195	0.0195			
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1			
Hardness CaCO3	mg/L				44	39	41	45	45			
Total Metals												
Aluminum Al	mg/L				0.25	0.12	0.19	0.15	0.15			
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006			
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004			
Barium Ba	mg/L				0.0051	0.0034	0.0045	0.0042	0.0042			
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001			
Bismuth Bi	mg/L				0.00012	0.00011	0.00011	0.00011	0.00011			
Boron B	mg/L				0.030	0.021	0.029	0.027	0.027			
Cadmium Cd	mg/L				0.0000027	0.0000042	0.0000147	0.0000022	0.0000022			
Calcium Ca	mg/L				8	7	7	8	8			
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000			
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001			
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0019	0.0019			
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16			
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025			
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029			
Magnesium Mg	mg/L				7.1	5.1	5.3	7.2	7.2			
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008			
Mercury Hg	mg/L				0.0000009	0.0000009	0.0000009	0.0000009	0.0000009			
Molybdenum Mo	mg/L				0.00019	0.00017	0.00025	0.00021	0.00021			
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006			
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019			
Potassium K	mg/L				2.8	2.3	2.2	2.5	2.5			
Selenium Se	mg/L				0.00066	0.00039	0.00084	0.00061	0.00061			
Silicon SiO2	mg/L				0.53	0.53	0.53	0.53	0.53			
Silver Ag	mg/L				0.0000049	0.0000024	0.0000049	0.0000030	0.0000030			
Sodium Na	mg/L				39	32	35	37	37			
Strontium Sr	mg/L				0.045	0.038	0.040	0.046	0.046			
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051			
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001			
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001			
Tin Sn	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001			
Titanium Ti	mg/L				0.0063	0.0063	0.0063	0.0063	0.0063			
Uranium U	mg/L				0.000036	0.000033	0.000035	0.000044	0.000044			
Vanadium V	mg/L				0.0005	0.0001	0.0005	0.0003	0.0003			
Zinc Zn	mg/L				0.0035	0.0017	0.0016	0.0052	0.0052			
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051			

Table H 3-A-3
Scenario 3

Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter												
TDS				141	124	129	151	153				
TSS				3.9	5.6	5.8	6.7	6.7				
Free CN				0.00008	0.00001	0.00003	0.00003	0.00003				
Total CN				0.003	0.002	0.002	0.002	0.002				
WAD CN				0.0001	0.0000	0.0000	0.0000	0.0000				
CNO				0.09	0.01	0.03	0.03	0.03				
SCN				0.001	0.001	0.002	0.002	0.002				
Sulphate				3.8	3.9	4.3	4.9	5.2				
Chloride				61	62	62	67	69				
Total Ammonia				0.019	0.044	0.022	0.030	0.030				
Nitrate				0.08	0.11	0.14	0.18	0.21				
Nitrite				0.011	0.013	0.014	0.006	0.016				
Alkalinity				27	25	27	27	27				
OrthoPhosphate-P				0.0023	0.0025	0.0028	0.0034	0.0039				
Phosphate-P				0.0173	0.0188	0.0250	0.0213	0.0218				
Org. Carbon				5.3	5.0	7.3	4.9	4.9				
Hardness CaCO3				45	43	43	45	45				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0010	0.0029	0.0008	0.0008				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0028	0.0032	0.0030	0.0032	0.0032				
Beryllium Be				0.00002	0.00002	0.00002	0.00002	0.00003				
Bismuth Bi				0.00012	0.00021	0.00028	0.00033	0.00039				
Boron B				0.033	0.022	0.023	0.022	0.022				
Cadmium Cd				0.0000037	0.0000040	0.0000038	0.0000040	0.0000043				
Calcium Ca				11	11	11	12	13				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0002	0.0003	0.0010	0.0003	0.0003				
Copper Cu				0.0013	0.0016	0.0014	0.0016	0.0017				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00002	0.00007	0.00005	0.00005	0.00005				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.1	6.4	6.5	6.4	6.4				
Manganese Mn				0.007	0.020	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000008	0.0000008				
Molybdenum Mo				0.00026	0.00027	0.00032	0.00034	0.00038				
Nickel Ni				0.0005	0.0007	0.0006	0.0006	0.0006				
Phosphorus P				0.019	0.021	0.027	0.024	0.025				
Potassium K				3.2	2.9	3.0	3.1	3.3				
Selenium Se				0.00086	0.00056	0.00060	0.00055	0.00055				
Silicon SiO2				0.54	0.55	0.57	0.58	0.60				
Silver Ag				0.0000049	0.0000058	0.0000060	0.0000064	0.0000065				
Sodium Na				38	32	34	32	32				
Strontium Sr				0.040	0.041	0.036	0.040	0.040				
Tellurium Te				0.049	0.049	0.049	0.049	0.049				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000016	0.0000020	0.0000022	0.0000023	0.0000025				
Tin Sn				0.00040	0.00041	0.00042	0.00043	0.00044				
Titanium Ti				0.0058	0.0059	0.0059	0.0059	0.0059				
Uranium U				0.000026	0.000032	0.000039	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0011	0.0033	0.0031	0.0021	0.0022				
Zirconium Zr				0.0049	0.0049	0.0049	0.0049	0.0049				

Table H 3-A-3
Scenario 3

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter												
TDS				160	139	143	165	166				
TSS				3.9	5.7	5.8	6.8	6.8				
Free CN				0.00020		0.00003	0.00003	0.00003				
Total CN				0.004	0.002	0.002	0.002	0.002				
WAD CN				0.0003		0.0000	0.0000	0.0000				
CNO				0.22		0.03	0.03	0.03				
SCN				0.005	0.004	0.004	0.005	0.005				
Sulphate				7.3	6.7	6.9	7.5	7.7				
Chloride				74	73	71	77	78				
Total Ammonia				0.044	0.084	0.016	0.031	0.030				
Nitrate				0.29	0.30	0.31	0.35	0.37				
Nitrite				0.032	0.012	0.014	0.005	0.016				
Alkalinity				29	27	28	28	28				
OrthoPhosphate-P				0.0073	0.0064	0.0065	0.0071	0.0075				
Phosphate-P				0.0223	0.0228	0.0286	0.0250	0.0254				
Org. Carbon				5.4	5.0	7.3	4.9	4.9				
Hardness CaCO3				48	45	45	47	47				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0009	0.0013	0.0033	0.0011	0.0011				
Arsenic As				0.0006	0.0005	0.0005	0.0005	0.0005				
Barium Ba				0.0032	0.0035	0.0033	0.0035	0.0035				
Beryllium Be				0.00003	0.00003	0.00003	0.00004	0.00004				
Bismuth Bi				0.00056	0.00056	0.00059	0.00066	0.00070				
Boron B				0.034	0.023	0.023	0.023	0.023				
Cadmium Cd				0.0000059	0.0000057	0.0000053	0.0000056	0.0000058				
Calcium Ca				21	18	18	19	20				
Chromium Cr				0.001	0.001	0.001	0.001	0.001				
Cobalt Co				0.0006	0.0006	0.0013	0.0006	0.0006				
Copper Cu				0.0016	0.0019	0.0016	0.0019	0.0019				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00004	0.00008	0.00006	0.00006	0.00006				
Lithium Li				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg				7.4	6.6	6.7	6.6	6.6				
Manganese Mn				0.008	0.021	0.014	0.011	0.011				
Mercury Hg				0.0000009	0.0000009	0.0000009	0.0000009	0.0000010				
Molybdenum Mo				0.00060	0.00054	0.00057	0.00060	0.00062				
Nickel Ni				0.0008	0.0009	0.0008	0.0008	0.0009				
Phosphorus P				0.027	0.027	0.033	0.030	0.030				
Potassium K				4.8	4.1	4.1	4.3	4.4				
Selenium Se				0.00087	0.00057	0.00061	0.00055	0.00056				
Silicon SiO2				0.68	0.66	0.66	0.68	0.69				
Silver Ag				0.0000070	0.0000074	0.0000075	0.0000079	0.0000080				
Sodium Na				39	33	35	33	33				
Strontium Sr				0.043	0.044	0.038	0.042	0.043				
Tellurium Te				0.049	0.049	0.049	0.049	0.049				
Thallium Tl				0.000031	0.000031	0.000031	0.000031	0.000031				
Thorium Th				0.0000023	0.0000026	0.0000028	0.0000029	0.0000030				
Tin Sn				0.00046	0.00046	0.00047	0.00048	0.00049				
Titanium Ti				0.0059	0.0059	0.0059	0.0059	0.0059				
Uranium U				0.000027	0.000032	0.000040	0.000034	0.000034				
Vanadium V				0.0007	0.0002	0.0004	0.0003	0.0003				
Zinc Zn				0.0020	0.0040	0.0037	0.0028	0.0028				
Zirconium Zr				0.0049	0.0049	0.0049	0.0049	0.0049				

Table H 3-A-3
Scenario 3

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter												
TDS				171	148	150	171	172				
TSS				3.9	5.7	5.8	6.8	6.8				
Free CN				0.00013								
Total CN				0.003	0.002	0.002	0.002	0.002				
WAD CN				0.0002								
CNO				0.14								
SCN				0.006	0.005	0.005	0.005	0.005				
Sulphate				8.7	7.5	7.4	7.7	7.6				
Chloride				82	80	78	83	84				
Total Ammonia				0.036	0.057	0.016	0.017	0.017				
Nitrate				0.39	0.36	0.35	0.38	0.38				
Nitrite				0.030	0.009	0.014	0.004	0.004				
Alkalinity				29	27	28	28	28				
OrthoPhosphate-P				0.0105	0.0091	0.0090	0.0098	0.0101				
Phosphate-P				0.0256	0.0255	0.0311	0.0277	0.0280				
Org. Carbon				5.4	5.0	7.3	4.9	4.9				
Hardness CaCO3				50	46	46	47	47				
Total Metals												
Aluminum Al				0.04	0.06	0.08	0.07	0.07				
Antimony Sb				0.0012	0.0016	0.0035	0.0013	0.0014				
Arsenic As				0.0006	0.0005	0.0005	0.0005	0.0005				
Barium Ba				0.0034	0.0035	0.0034	0.0035	0.0035				
Beryllium Be				0.00004	0.00004	0.00004	0.00004	0.00004				
Bismuth Bi				0.00085	0.00080	0.00082	0.00089	0.00093				
Boron B				0.034	0.023	0.024	0.023	0.023				
Cadmium Cd				0.0000067	0.0000062	0.0000055	0.0000056	0.0000056				
Calcium Ca				24	20	19	19	19				
Chromium Cr				0.001	0.001	0.001	0.001	0.001				
Cobalt Co				0.0007	0.0007	0.0013	0.0006	0.0006				
Copper Cu				0.0017	0.0019	0.0017	0.0019	0.0019				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00005	0.00008	0.00006	0.00006	0.00006				
Lithium Li				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg				7.5	6.7	6.8	6.6	6.6				
Manganese Mn				0.008	0.021	0.014	0.011	0.011				
Mercury Hg				0.0000010	0.0000009	0.0000009	0.0000009	0.0000009				
Molybdenum Mo				0.00073	0.00061	0.00060	0.00059	0.00058				
Nickel Ni				0.0009	0.0010	0.0009	0.0009	0.0008				
Phosphorus P				0.032	0.031	0.036	0.033	0.033				
Potassium K				5.3	4.4	4.3	4.2	4.2				
Selenium Se				0.00088	0.00057	0.00061	0.00056	0.00056				
Silicon SiO2				0.73	0.69	0.68	0.69	0.68				
Silver Ag				0.0000082	0.0000083	0.0000082	0.0000085	0.0000085				
Sodium Na				40	34	35	33	33				
Strontium Sr				0.044	0.044	0.038	0.042	0.042				
Tellurium Te				0.049	0.049	0.049	0.049	0.049				
Thallium Tl				0.000031	0.000031	0.000031	0.000031	0.000031				
Thorium Th				0.0000028	0.0000028	0.0000029	0.0000030	0.0000030				
Tin Sn				0.00051	0.00050	0.00051	0.00052	0.00052				
Titanium Ti				0.0059	0.0059	0.0059	0.0059	0.0059				
Uranium U				0.000028	0.000032	0.000040	0.000034	0.000034				
Vanadium V				0.0007	0.0002	0.0004	0.0003	0.0003				
Zinc Zn				0.0023	0.0042	0.0038	0.0028	0.0028				
Zirconium Zr				0.0049	0.0049	0.0049	0.0050	0.0050				

Table H 3-A-3
Scenario 3

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter												
TDS				173	158	169	201	212				
TSS				3.9	5.7	5.8	6.8	6.8				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.005	0.004	0.003	0.003	0.003				
Sulphate				7.4	6.3	6.1	6.4	6.3				
Chloride				88	89	91	103	110				
Total Ammonia				0.012	0.012	0.017	0.016	0.016				
Nitrate				0.34	0.29	0.28	0.29	0.29				
Nitrite				0.011	0.002	0.003	0.003	0.003				
Alkalinity				29	26	28	28	28				
OrthoPhosphate-P				0.0126	0.0100	0.0092	0.0094	0.0092				
Phosphate-P				0.0276	0.0265	0.0315	0.0275	0.0273				
Org. Carbon				5.4	5.1	7.3	5.0	5.0				
Hardness CaCO3				48	45	44	46	46				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0014	0.0016	0.0035	0.0012	0.0012				
Arsenic As				0.0006	0.0005	0.0005	0.0005	0.0005				
Barium Ba				0.0032	0.0034	0.0032	0.0033	0.0033				
Beryllium Be				0.00005	0.00004	0.00004	0.00004	0.00004				
Bismuth Bi				0.00107	0.00085	0.00077	0.00079	0.00077				
Boron B				0.034	0.023	0.024	0.023	0.023				
Cadmium Cd				0.0000060	0.0000056	0.0000050	0.0000052	0.0000052				
Calcium Ca				20	17	17	17	18				
Chromium Cr				0.001	0.001	0.001	0.000	0.000				
Cobalt Co				0.0005	0.0005	0.0012	0.0004	0.0004				
Copper Cu				0.0016	0.0018	0.0015	0.0018	0.0018				
Iron Fe				0.05	0.12	0.09	0.09	0.09				
Lead Pb				0.00004	0.00008	0.00006	0.00006	0.00006				
Lithium Li				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg				7.4	6.7	6.7	6.6	6.6				
Manganese Mn				0.008	0.021	0.014	0.011	0.011				
Mercury Hg				0.0000009	0.0000010	0.0000010	0.0000011	0.0000011				
Molybdenum Mo				0.00056	0.00047	0.00047	0.00046	0.00045				
Nickel Ni				0.0008	0.0009	0.0008	0.0007	0.0007				
Phosphorus P				0.033	0.031	0.035	0.031	0.031				
Potassium K				4.6	3.8	3.7	3.7	3.6				
Selenium Se				0.00088	0.00057	0.00062	0.00056	0.00057				
Silicon SiO2				0.68	0.65	0.64	0.65	0.65				
Silver Ag				0.0000088	0.0000086	0.0000083	0.0000086	0.0000085				
Sodium Na				39	37	42	44	48				
Strontium Sr				0.043	0.043	0.037	0.042	0.042				
Tellurium Te				0.049	0.049	0.049	0.049	0.049				
Thallium Tl				0.000031	0.000031	0.000031	0.000031	0.000031				
Thorium Th				0.0000030	0.0000034	0.0000037	0.0000039	0.0000040				
Tin Sn				0.00054	0.00051	0.00050	0.00050	0.00050				
Titanium Ti				0.0059	0.0060	0.0061	0.0061	0.0061				
Uranium U				0.000028	0.000033	0.000041	0.000035	0.000035				
Vanadium V				0.0007	0.0002	0.0004	0.0003	0.0003				
Zinc Zn				0.0020	0.0039	0.0036	0.0025	0.0025				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 3-A-3
Scenario 3

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter												
TDS				216	179	176	187	186				
TSS				4.0	5.7	5.9	6.8	6.8				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.003	0.002	0.002	0.002	0.002				
Sulphate				6.0	5.1	4.9	4.8	4.7				
Chloride				113	100	94	93	92				
Total Ammonia				0.008	0.013	0.017	0.016	0.016				
Nitrate				0.23	0.20	0.19	0.17	0.17				
Nitrite				0.003	0.003	0.003	0.003	0.003				
Alkalinity				28	26	28	27	27				
OrthoPhosphate-P				0.0088	0.0068	0.0061	0.0055	0.0053				
Phosphate-P				0.0241	0.0235	0.0286	0.0237	0.0236				
Org. Carbon				5.4	5.1	7.3	5.0	5.0				
Hardness CaCO3				47	44	44	45	45				
Total Metals												
Aluminum Al				0.04	0.06	0.08	0.07	0.08				
Antimony Sb				0.0011	0.0013	0.0032	0.0009	0.0009				
Arsenic As				0.0006	0.0005	0.0004	0.0004	0.0004				
Barium Ba				0.0031	0.0033	0.0031	0.0032	0.0032				
Beryllium Be				0.00004	0.00003	0.00003	0.00003	0.00003				
Bismuth Bi				0.00074	0.00056	0.00050	0.00044	0.00043				
Boron B				0.034	0.023	0.024	0.023	0.023				
Cadmium Cd				0.0000055	0.0000052	0.0000047	0.0000045	0.0000045				
Calcium Ca				19	16	15	14	13				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0004	0.0004	0.0011	0.0003	0.0003				
Copper Cu				0.0015	0.0017	0.0014	0.0016	0.0016				
Iron Fe				0.05	0.12	0.09	0.09	0.09				
Lead Pb				0.00004	0.00008	0.00005	0.00005	0.00005				
Lithium Li				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg				7.4	6.6	6.7	6.5	6.5				
Manganese Mn				0.007	0.020	0.013	0.010	0.010				
Mercury Hg				0.0000011	0.0000011	0.0000012	0.0000011	0.0000012				
Molybdenum Mo				0.00044	0.00036	0.00037	0.00032	0.00032				
Nickel Ni				0.0007	0.0008	0.0007	0.0006	0.0006				
Phosphorus P				0.028	0.026	0.031	0.026	0.026				
Potassium K				4.0	3.3	3.2	3.0	3.0				
Selenium Se				0.00089	0.00058	0.00063	0.00057	0.00057				
Silicon SiO2				0.64	0.62	0.61	0.59	0.59				
Silver Ag				0.0000084	0.0000083	0.0000081	0.0000073	0.0000073				
Sodium Na				58	47	47	43	43				
Strontium Sr				0.042	0.043	0.037	0.040	0.040				
Tellurium Te				0.049	0.049	0.049	0.049	0.049				
Thallium Tl				0.000031	0.000031	0.000031	0.000031	0.000031				
Thorium Th				0.0000040	0.0000042	0.0000044	0.0000042	0.0000044				
Tin Sn				0.00050	0.00047	0.00046	0.00045	0.00045				
Titanium Ti				0.0061	0.0062	0.0062	0.0062	0.0062				
Uranium U				0.000029	0.000034	0.000042	0.000035	0.000035				
Vanadium V				0.0007	0.0002	0.0004	0.0003	0.0003				
Zinc Zn				0.0017	0.0037	0.0033	0.0021	0.0021				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 3-A-3
Scenario 3

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter												
TDS				177	150	150	170	167				
TSS				4.0	5.7	5.9	6.8	6.8				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.002	0.001	0.001	0.001	0.001				
Sulphate				4.4	3.9	3.9	4.1	3.9				
Chloride				87	81	77	81	79				
Total Ammonia				0.005	0.009	0.014	0.013	0.013				
Nitrate				0.10	0.09	0.09	0.10	0.09				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0049	0.0039	0.0036	0.0036	0.0034				
Phosphate-P				0.0202	0.0206	0.0261	0.0220	0.0217				
Org. Carbon				5.4	5.1	7.3	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.04	0.06	0.08	0.08	0.08				
Antimony Sb				0.0007	0.0011	0.0029	0.0007	0.0007				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00002	0.00002	0.00002	0.00002	0.00002				
Bismuth Bi				0.00039	0.00030	0.00028	0.00028	0.00026				
Boron B				0.034	0.023	0.023	0.023	0.023				
Cadmium Cd				0.0000040	0.0000039	0.0000034	0.0000035	0.0000034				
Calcium Ca				14	12	11	11	11				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0002	0.0003	0.0010	0.0002	0.0002				
Copper Cu				0.0013	0.0016	0.0013	0.0016	0.0016				
Iron Fe				0.05	0.12	0.09	0.09	0.09				
Lead Pb				0.00003	0.00007	0.00005	0.00004	0.00004				
Lithium Li				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg				7.2	6.5	6.6	6.5	6.5				
Manganese Mn				0.007	0.020	0.013	0.010	0.010				
Mercury Hg				0.0000010	0.0000011	0.0000011	0.0000012	0.0000011				
Molybdenum Mo				0.00030	0.00026	0.00028	0.00026	0.00025				
Nickel Ni				0.0006	0.0007	0.0006	0.0005	0.0005				
Phosphorus P				0.022	0.022	0.027	0.023	0.023				
Potassium K				3.4	2.9	2.8	2.8	2.7				
Selenium Se				0.00088	0.00058	0.00063	0.00057	0.00057				
Silicon SiO2				0.58	0.57	0.57	0.57	0.56				
Silver Ag				0.0000059	0.0000062	0.0000060	0.0000063	0.0000058				
Sodium Na				48	40	41	39	38				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.049	0.049	0.049	0.049	0.049				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000026	0.0000028	0.0000030	0.0000032	0.0000031				
Tin Sn				0.00044	0.00043	0.00043	0.00043	0.00042				
Titanium Ti				0.0061	0.0062	0.0062	0.0063	0.0062				
Uranium U				0.000027	0.000032	0.000040	0.000034	0.000034				
Vanadium V				0.0006	0.0002	0.0003	0.0003	0.0002				
Zinc Zn				0.0013	0.0034	0.0030	0.0020	0.0020				
Zirconium Zr				0.0049	0.0049	0.0050	0.0050	0.0050				

Table H 3-A-3
Scenario 3

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter												
TDS				158	135	137	154	154				
TSS				4.0	5.7	5.9	6.8	6.8				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.001	0.001	0.001	0.001	0.000				
Sulphate				3.6	3.3	3.4	3.4	3.4				
Chloride				75	71	68	71	71				
Total Ammonia				0.005	0.008	0.013	0.012	0.012				
Nitrate				0.04	0.03	0.03	0.03	0.03				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				27	25	27	26	26				
OrthoPhosphate-P				0.0030	0.0025	0.0023	0.0021	0.0021				
Phosphate-P				0.0184	0.0193	0.0249	0.0204	0.0204				
Org. Carbon				5.4	5.1	7.3	4.9	5.0				
Hardness CaCO3				45	42	42	43	43				
Total Metals												
Aluminum Al				0.04	0.06	0.08	0.07	0.07				
Antimony Sb				0.0006	0.0009	0.0028	0.0006	0.0006				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0031	0.0030	0.0030	0.0030				
Beryllium Be				0.00002	0.00002	0.00002	0.00001	0.00001				
Bismuth Bi				0.00023	0.00018	0.00016	0.00015	0.00014				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000037	0.0000035	0.0000029	0.0000028	0.0000028				
Calcium Ca				11	10	10	9	9				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0001	0.0002	0.0009	0.0001	0.0001				
Copper Cu				0.0013	0.0016	0.0013	0.0015	0.0015				
Iron Fe				0.06	0.13	0.09	0.09	0.09				
Lead Pb				0.00003	0.00007	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0029	0.0029	0.0028	0.0028				
Magnesium Mg				7.2	6.5	6.6	6.4	6.4				
Manganese Mn				0.007	0.020	0.013	0.010	0.010				
Mercury Hg				0.0000011	0.0000011	0.0000011	0.0000011	0.0000011				
Molybdenum Mo				0.00024	0.00021	0.00024	0.00021	0.00021				
Nickel Ni				0.0005	0.0006	0.0005	0.0005	0.0005				
Phosphorus P				0.019	0.020	0.025	0.021	0.021				
Potassium K				3.1	2.7	2.6	2.5	2.5				
Selenium Se				0.00089	0.00058	0.00063	0.00056	0.00056				
Silicon SiO2				0.55	0.55	0.55	0.54	0.54				
Silver Ag				0.0000053	0.0000056	0.0000053	0.0000048	0.0000047				
Sodium Na				44	37	38	35	35				
Strontium Sr				0.040	0.041	0.036	0.039	0.039				
Tellurium Te				0.049	0.049	0.049	0.049	0.049				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000028	0.0000026	0.0000026	0.0000024	0.0000024				
Tin Sn				0.00042	0.00041	0.00041	0.00040	0.00040				
Titanium Ti				0.0062	0.0062	0.0062	0.0062	0.0062				
Uranium U				0.000027	0.000032	0.000040	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0012	0.0032	0.0029	0.0018	0.0018				
Zirconium Zr				0.0049	0.0049	0.0049	0.0049	0.0049				

Table H 3-A-3
Scenario 3

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter												
TDS				148	128	131	148	148				
TSS				4.0	5.7	5.9	6.8	6.8				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.000	0.000	0.000	0.000	0.000				
Sulphate				3.2	3.0	3.1	3.2	3.2				
Chloride				68	66	64	67	67				
Total Ammonia				0.005	0.008	0.013	0.012	0.012				
Nitrate				0.01	0.01	0.01	0.01	0.01				
Nitrite				0.0019	0.0019	0.002	0.002	0.002				
Alkalinity				27	25	27	26	26				
OrthoPhosphate-P				0.0020	0.0017	0.0016	0.0015	0.0015				
Phosphate-P				0.0174	0.0185	0.0242	0.0198	0.0198				
Org. Carbon				5.4	5.1	7.3	5.0	5.0				
Hardness CaCO3				45	42	42	43	43				
Total Metals												
Aluminum Al				0.04	0.06	0.08	0.07	0.07				
Antimony Sb				0.0005	0.0009	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0028	0.0031	0.0029	0.0030	0.0030				
Beryllium Be				0.00002	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00014	0.00011	0.00010	0.00009	0.00009				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000032	0.0000031	0.0000026	0.0000025	0.0000025				
Calcium Ca				10	9	9	8	8				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0001	0.0002	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.06	0.13	0.09	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.2	6.5	6.5	6.4	6.4				
Manganese Mn				0.007	0.020	0.013	0.010	0.010				
Mercury Hg				0.0000011	0.0000011	0.0000011	0.0000011	0.0000011				
Molybdenum Mo				0.00020	0.00019	0.00021	0.00019	0.00019				
Nickel Ni				0.0004	0.0006	0.0005	0.0005	0.0005				
Phosphorus P				0.018	0.019	0.024	0.020	0.020				
Potassium K				3.0	2.6	2.5	2.4	2.4				
Selenium Se				0.00089	0.00058	0.00063	0.00056	0.00056				
Silicon SiO2				0.54	0.54	0.54	0.53	0.53				
Silver Ag				0.0000047	0.0000051	0.0000049	0.0000044	0.0000043				
Sodium Na				42	35	36	34	34				
Strontium Sr				0.040	0.041	0.035	0.039	0.039				
Tellurium Te				0.049	0.049	0.049	0.049	0.049				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000023	0.0000023	0.0000023	0.0000021	0.0000021				
Tin Sn				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti				0.0062	0.0062	0.0063	0.0062	0.0062				
Uranium U				0.000027	0.000031	0.000039	0.000032	0.000032				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0011	0.0032	0.0029	0.0018	0.0018				
Zirconium Zr				0.0049	0.0049	0.0049	0.0049	0.0049				

Table H 3-A-3
Scenario 3

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

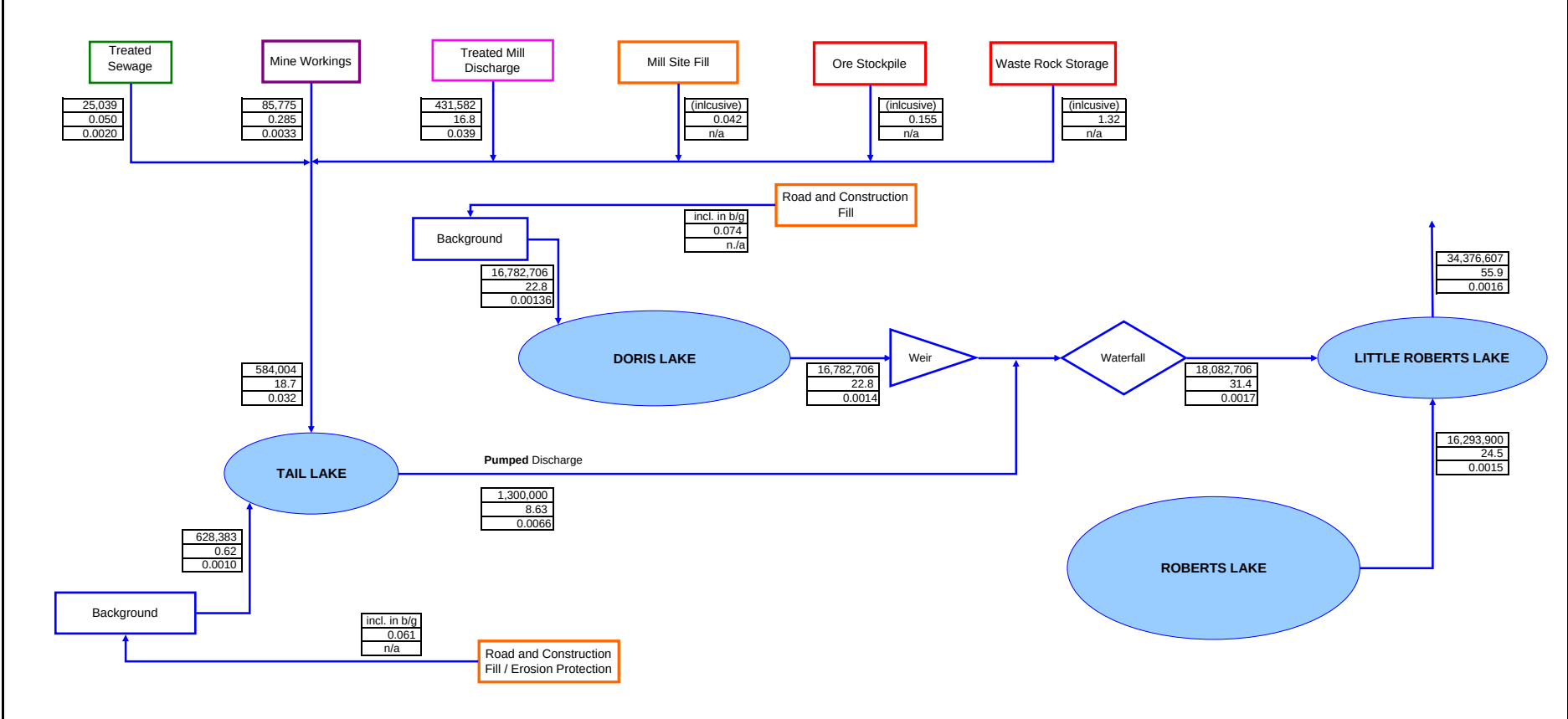
Date	Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter												
TDS				142	123	127	146	145				
TSS				3.9	5.7	5.9	6.8	6.8				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.000	0.000	0.000	0.000	0.000				
Sulphate				3.0	2.8	2.9	3.1	3.1				
Chloride				64	63	61	65	65				
Total Ammonia				0.005	0.008	0.013	0.012	0.012				
Nitrate				0.01	0.01	0.01	0.01	0.01				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				27	25	27	26	26				
OrthoPhosphate-P				0.0014	0.0013	0.0012	0.0012	0.0012				
Phosphate-P				0.0168	0.0181	0.0238	0.0196	0.0195				
Org. Carbon				5.4	5.1	7.3	5.0	5.0				
Hardness CaCO3				44	42	42	43	43				
Total Metals												
Aluminum Al				0.04	0.06	0.08	0.08	0.08				
Antimony Sb				0.0004	0.0008	0.0027	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0028	0.0031	0.0029	0.0030	0.0030				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00008	0.00007	0.00007	0.00007	0.00006				
Boron B				0.034	0.023	0.023	0.023	0.022				
Cadmium Cd				0.0000029	0.0000029	0.0000024	0.0000024	0.0000024				
Calcium Ca				9	8	8	8	8				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0001	0.0002	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.06	0.13	0.09	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0029	0.0028				
Magnesium Mg				7.1	6.4	6.5	6.4	6.4				
Manganese Mn				0.006	0.020	0.013	0.010	0.010				
Mercury Hg				0.0000010	0.0000011	0.0000011	0.0000011	0.0000011				
Molybdenum Mo				0.00018	0.00017	0.00020	0.00018	0.00018				
Nickel Ni				0.0004	0.0006	0.0005	0.0005	0.0004				
Phosphorus P				0.017	0.018	0.024	0.019	0.019				
Potassium K				2.9	2.5	2.5	2.4	2.4				
Selenium Se				0.00088	0.00058	0.00062	0.00057	0.00057				
Silicon SiO2				0.53	0.53	0.53	0.53	0.53				
Silver Ag				0.0000041	0.0000046	0.0000045	0.0000046	0.0000043				
Sodium Na				40	34	35	33	33				
Strontium Sr				0.040	0.041	0.035	0.039	0.039				
Tellurium Te				0.049	0.049	0.049	0.049	0.049				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000019	0.0000020	0.0000020	0.0000022	0.0000021				
Tin Sn				0.00039	0.00039	0.00039	0.00039	0.00039				
Titanium Ti				0.0062	0.0062	0.0063	0.0063	0.0063				
Uranium U				0.000026	0.000031	0.000039	0.000033	0.000032				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0010	0.0031	0.0028	0.0017	0.0018				
Zirconium Zr				0.0049	0.0049	0.0049	0.0049	0.0049				

Table H 3-A-3
Scenario 3

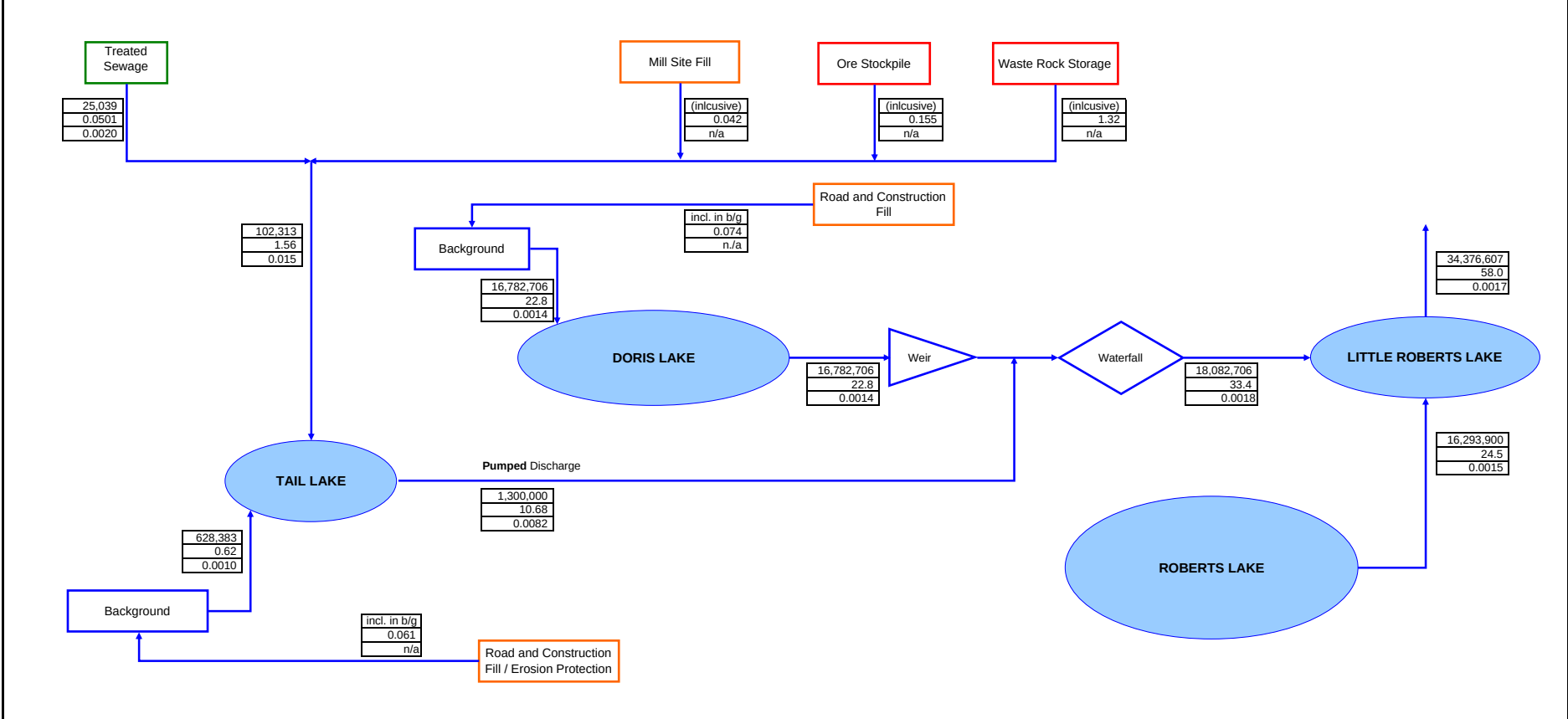
Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16	Year 10 Jan-17
Parameter												
TDS				140	121	125	143	143				
TSS				3.9	5.7	5.9	6.8	6.8				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.000	0.000	0.000	0.000	0.000				
Sulphate				2.9	2.7	2.9	3.0	3.0				
Chloride				62	62	60	63	63				
Total Ammonia				0.005	0.008	0.013	0.012	0.012				
Nitrate				0.01	0.01	0.01	0.01	0.01				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				27	25	27	26	26				
OrthoPhosphate-P				0.0011	0.0010	0.0010	0.0010	0.0010				
Phosphate-P				0.0166	0.0179	0.0236	0.0193	0.0193				
Org. Carbon				5.4	5.1	7.3	4.9	5.0				
Hardness CaCO3				44	42	42	43	43				
Total Metals												
Aluminum Al				0.04	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0027	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0028	0.0031	0.0029	0.0030	0.0030				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00006	0.00005	0.00005	0.00005	0.00005				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000028	0.0000028	0.0000023	0.0000023	0.0000023				
Calcium Ca				9	8	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0001	0.0001	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.06	0.13	0.09	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.1	6.4	6.5	6.4	6.4				
Manganese Mn				0.006	0.020	0.013	0.010	0.010				
Mercury Hg				0.0000011	0.0000011	0.0000011	0.0000011	0.0000011				
Molybdenum Mo				0.00017	0.00016	0.00019	0.00017	0.00017				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.016	0.018	0.023	0.019	0.019				
Potassium K				2.8	2.4	2.4	2.4	2.4				
Selenium Se				0.00088	0.00058	0.00063	0.00056	0.00056				
Silicon SiO2				0.52	0.53	0.53	0.52	0.52				
Silver Ag				0.0000040	0.0000045	0.0000044	0.0000040	0.0000039				
Sodium Na				40	34	35	33	33				
Strontium Sr				0.040	0.041	0.035	0.039	0.039				
Tellurium Te				0.049	0.049	0.049	0.049	0.049				
Thallium Tl				0.000030	0.000030	0.000030	0.000029	0.000030				
Thorium Th				0.0000018	0.0000019	0.0000020	0.0000018	0.0000019				
Tin Sn				0.00039	0.00039	0.00039	0.00039	0.00039				
Titanium Ti				0.0062	0.0062	0.0063	0.0062	0.0062				
Uranium U				0.000026	0.000031	0.000039	0.000032	0.000032				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0010	0.0031	0.0028	0.0017	0.0017				
Zirconium Zr				0.0049	0.0049	0.0049	0.0049	0.0049				

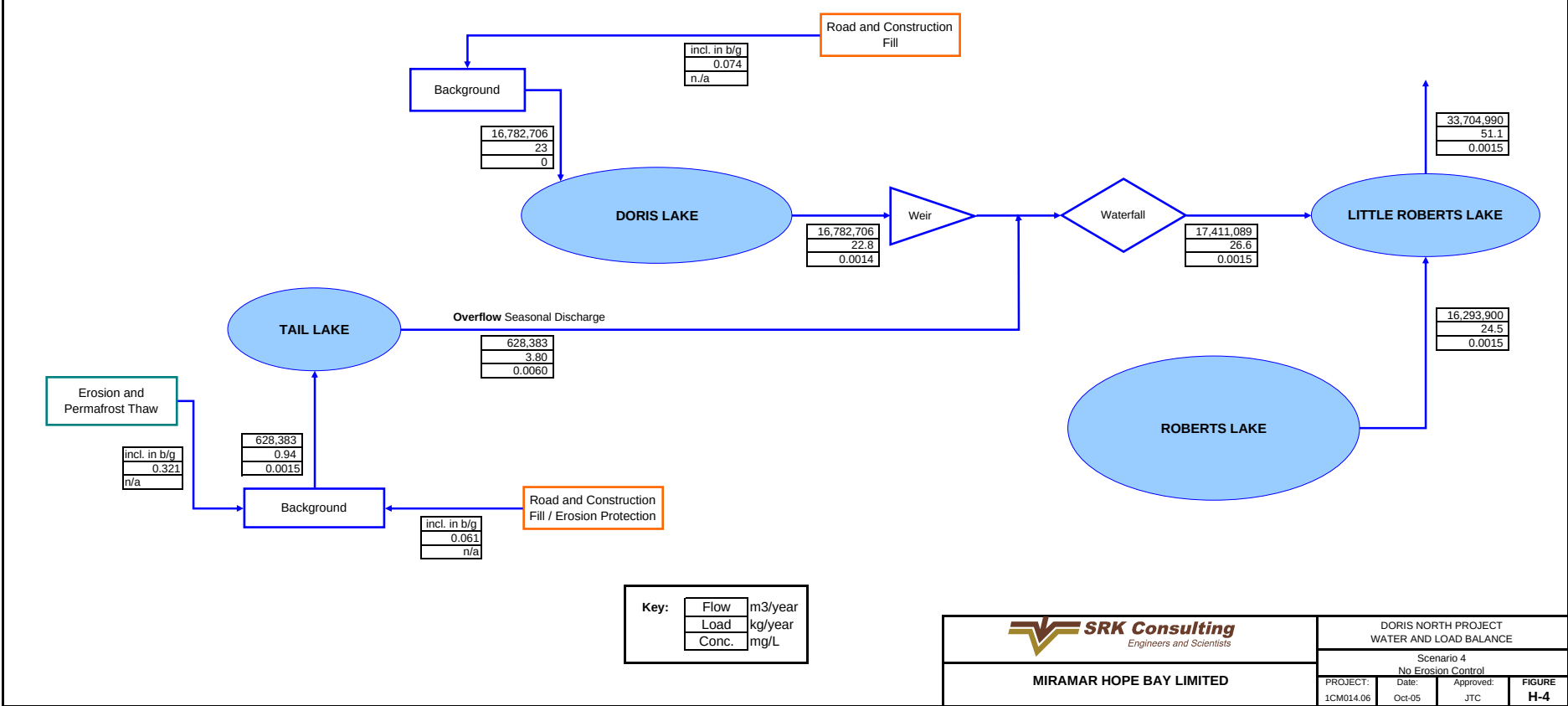
SCENARIO 4 - OPERATIONAL CONDITIONS
Year 2



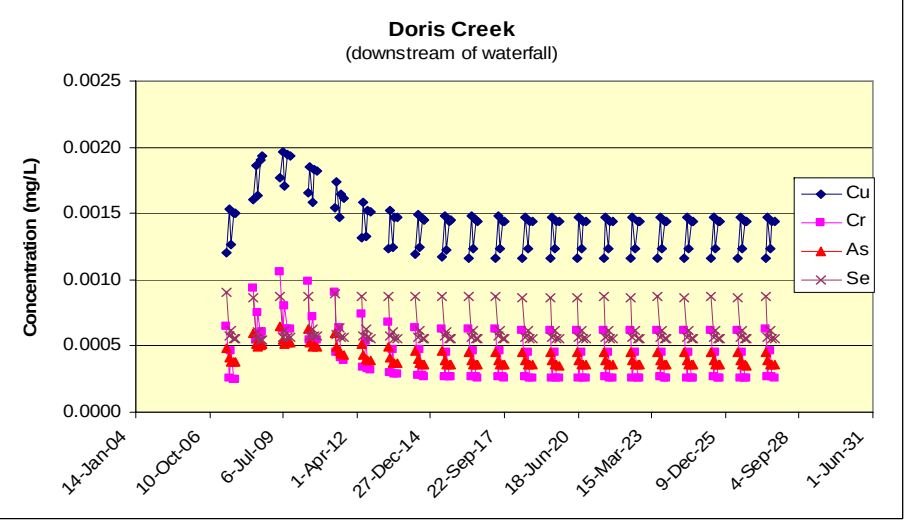
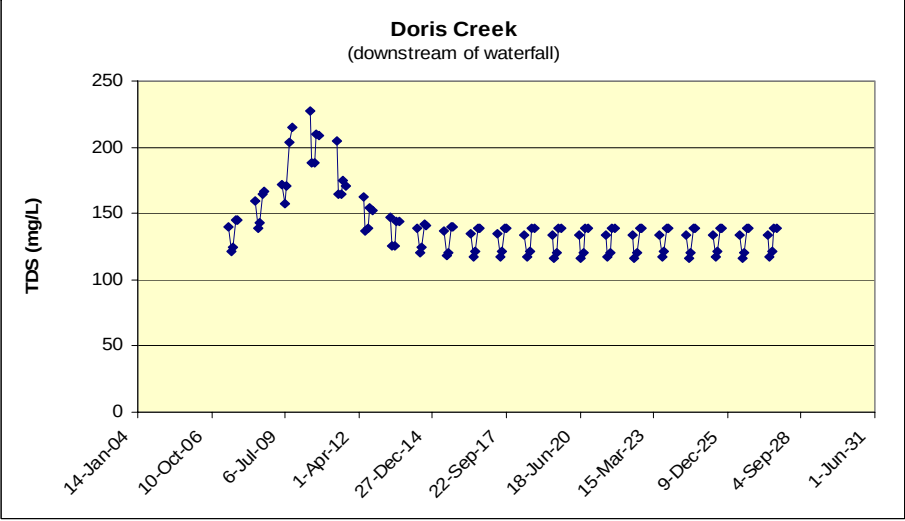
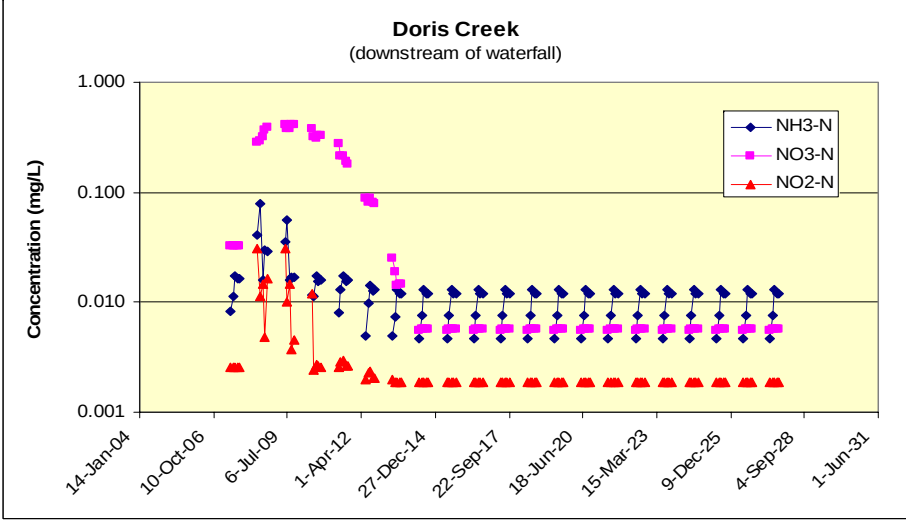
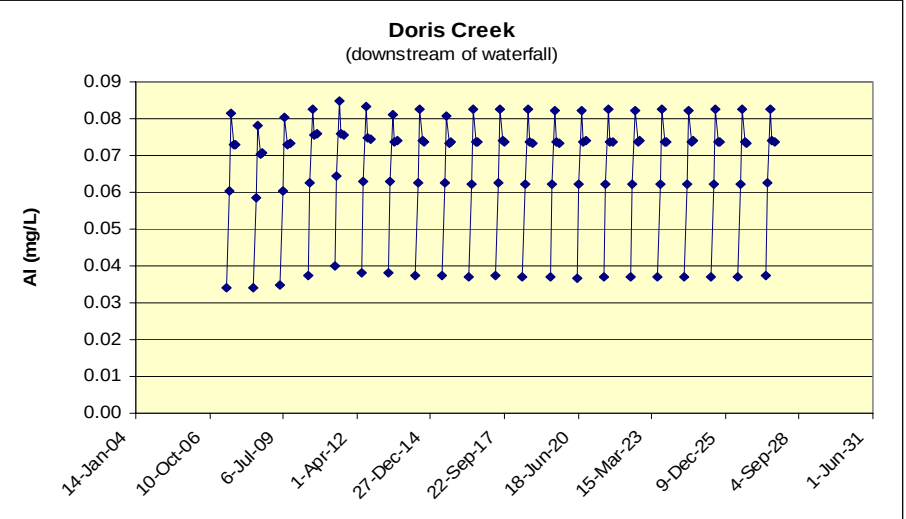
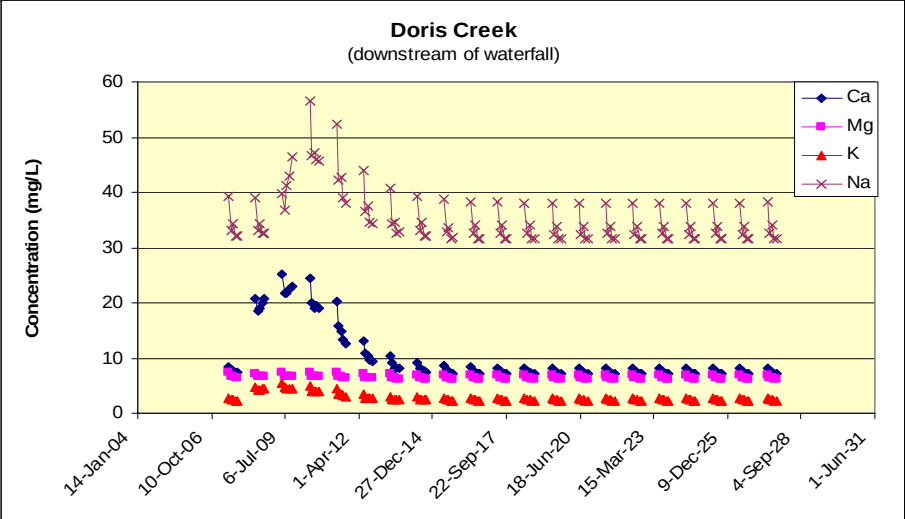
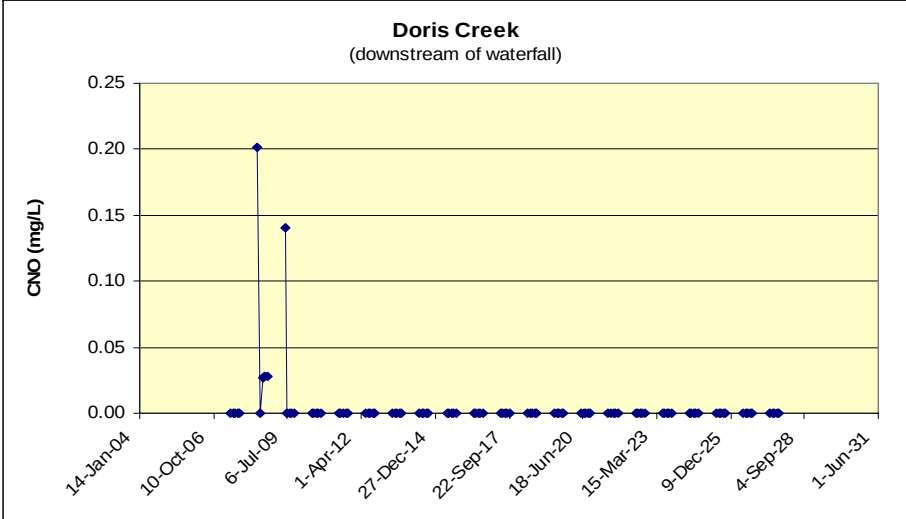
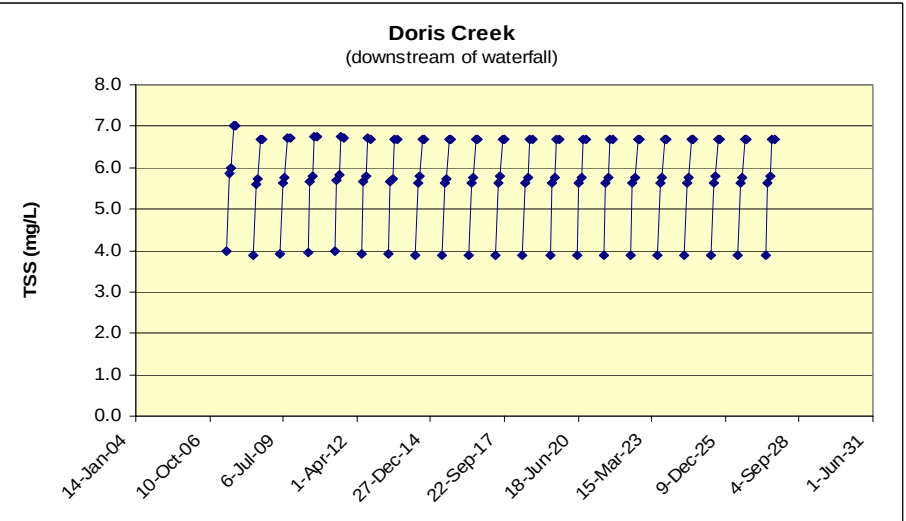
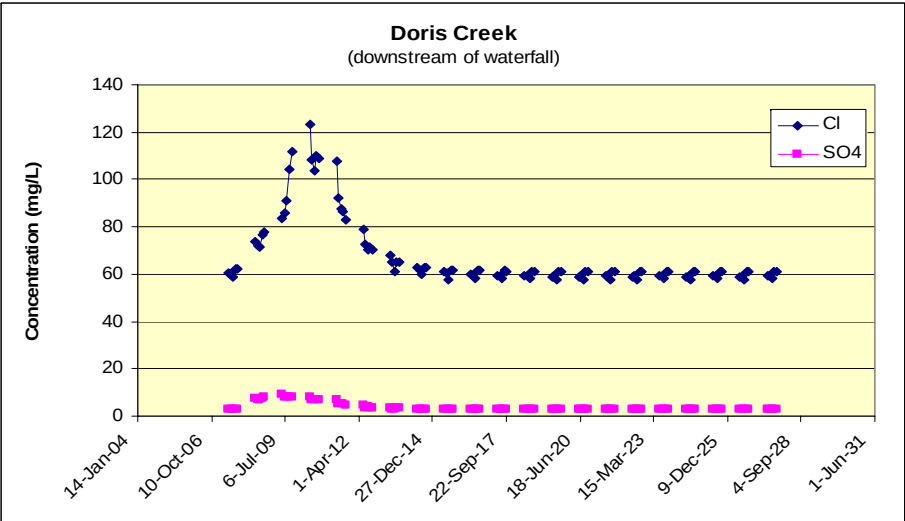
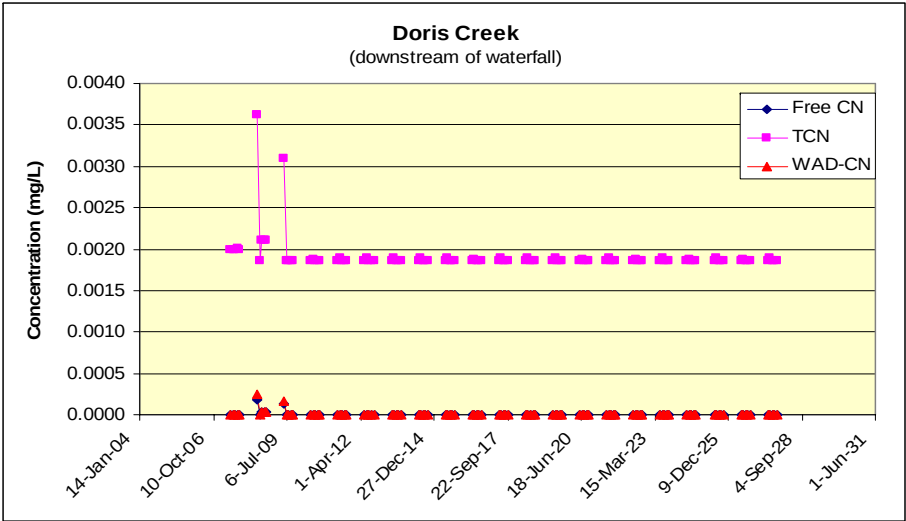
POST MILLING OPERATIONAL CONDITIONS
Year 3



POST CLOSURE CONDITIONS
Year 5



Scenario 4



Scenario 4

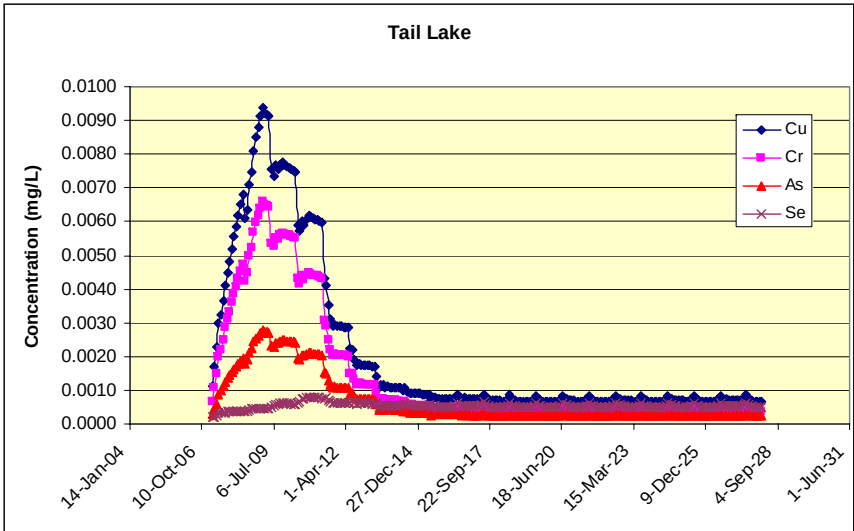
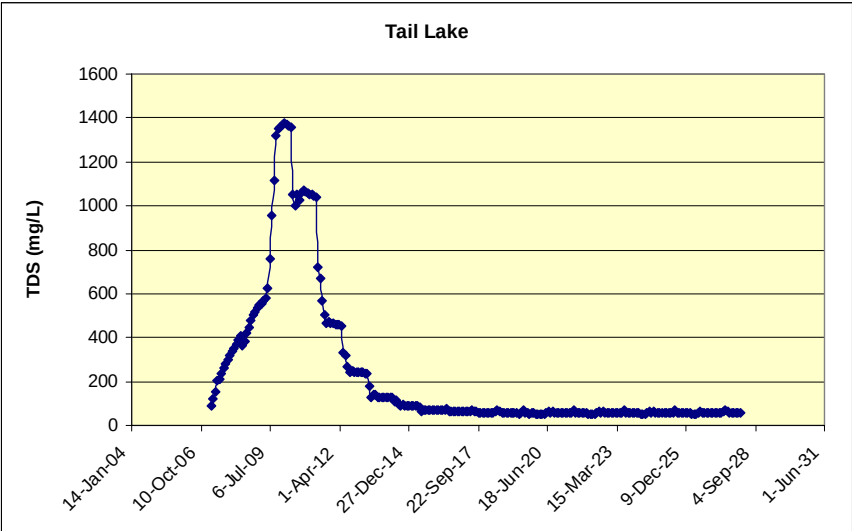
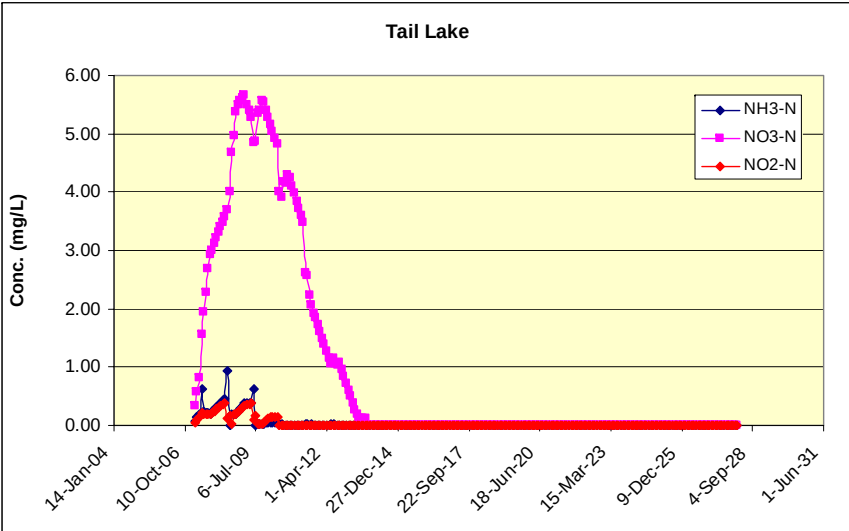
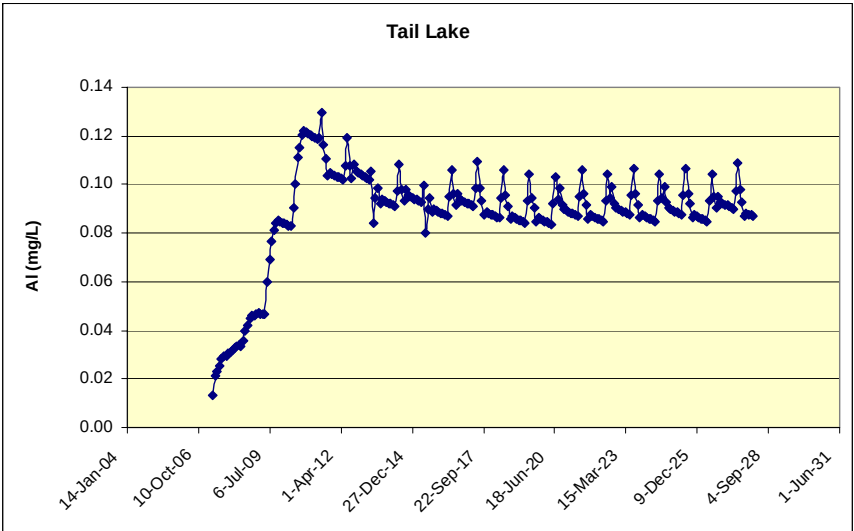
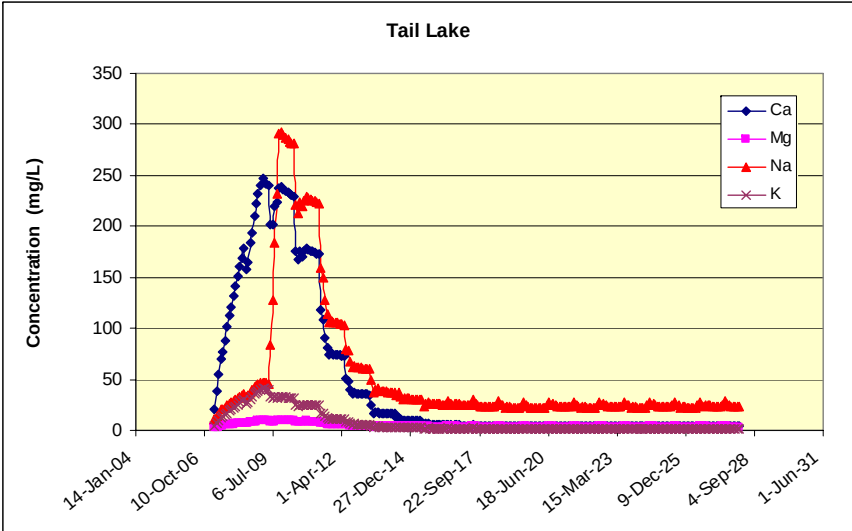
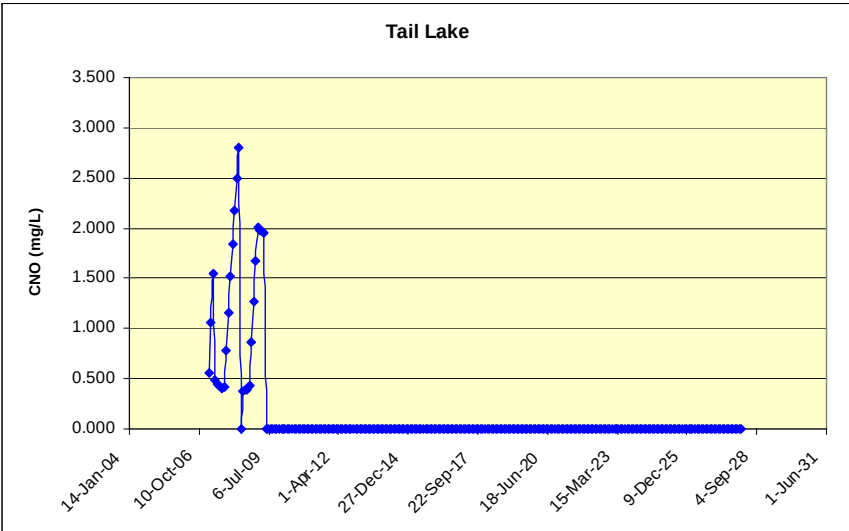
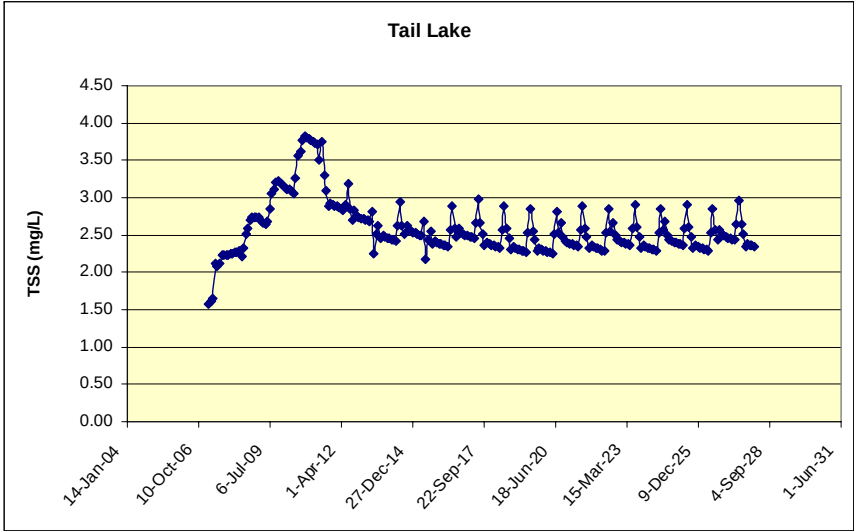
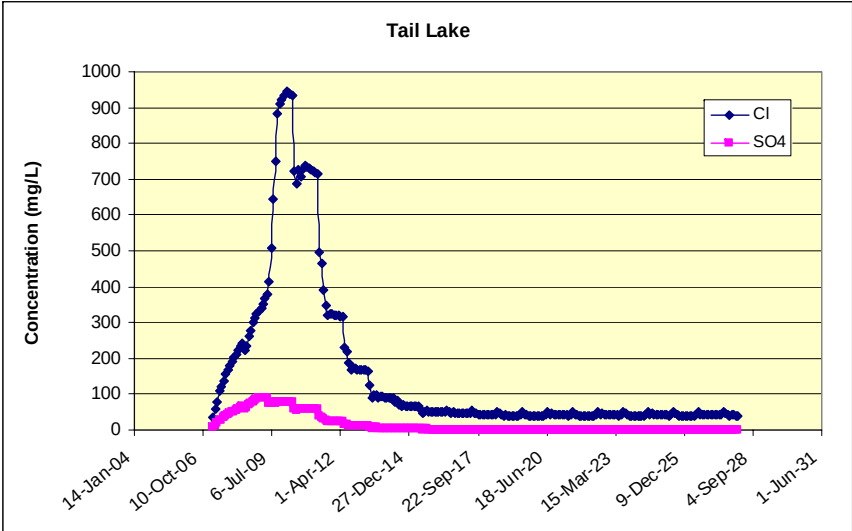
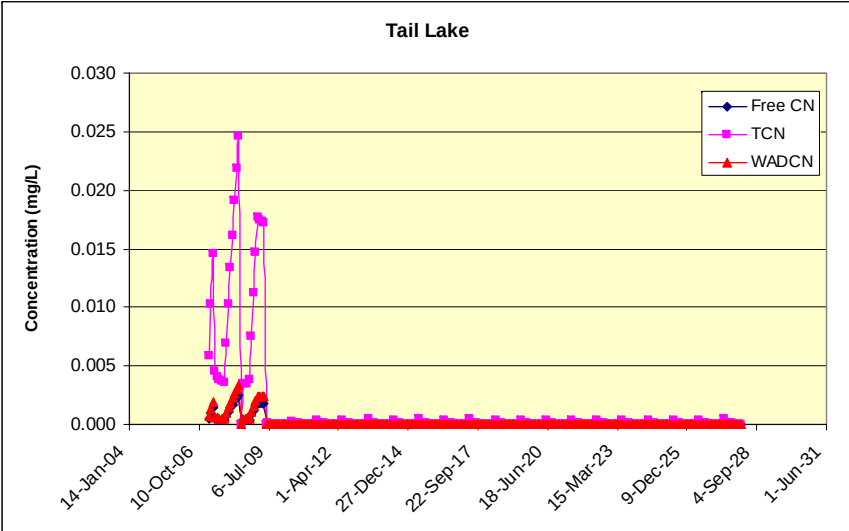


Table H-4-A-1
Scenario 4

OUTPUT SUMMARY						Fraction of CCME in Doris Creek (%)	
Discharge rate		1300000 m³/year					
Degradation Field(age)		Tail Lk Cu < CME Year 7					
		MMER	CCME	Tail Lake Year 2	Doris Creek Year 3	L'Roberts L Year 3	
Maximum Concentration							
pH			6 to 9	7 to 8	7 to 8	7 to 8	
TDS	mg/L			1377	227	202	
TSS	mg/L			3.8	7.0	8.1	
Free CN	mg/L		0.005	0.0025	0.00018	0.00010	4%
Total CN	mg/L	1.0		0.025	0.004	0.003	
WAD CN	mg/L			0.0034	0.0002	0.0001	
CNO	mg/L			2.8	0.20	0.11	
SCN	mg/L			0.099	0.007	0.004	
Sulphate	mg/L			92	9.1	7.4	
Chloride	mg/L			947	123	96	
Total Ammonia	mg/L		0.97	0.94	0.078	0.042	8%
Nitrate	mg/L		2.9	5.7	0.42	0.22	14%
Nitrite	mg/L		0.018	0.39	0.031	0.017	169%
Alkalinity	mg/L			56	29	27	
OrthoPhosphate-P	mg/L			0.1892	0.0141	0.0080	
Phosphate-P	mg/L			0.1953	0.0325	0.0313	
Org. Carbon	mg/L			4.7	7.5	7.2	
Hardness CaCO3	mg/L			109	50	47	
Total Metals							
Aluminum Al	mg/L		0.1	0.13	0.08	0.25	85%
Antimony Sb	mg/L			0.0171	0.0035	0.0022	
Arsenic As	mg/L	0.5	0.005	0.00	0.0006	0.0006	13%
Barium Ba	mg/L			0.0106	0.0035	0.0055	
Beryllium Be	mg/L			0.00064	0.00005	0.00003	
Bismuth Bi	mg/L			0.01654	0.00120	0.00072	
Boron B	mg/L			0.036	0.035	0.031	
Cadmium Cd	mg/L		0.000038	0.000056	0.0000070	0.0000166	18%
Calcium Ca	mg/L			248	25	17	
Chromium Cr	mg/L		0.001	0.0066	0.0011	0.001	106%
Cobalt Co	mg/L			0.0103	0.0014	0.0007	
Copper Cu	mg/L	0.3	0.002	0.009	0.00197	0.0021	98%
Iron Fe	mg/L		0.3	0.14	0.13	0.28	42%
Lead Pb	mg/L	0.2	0.002	0.00041	0.00008	0.00027	4%
Lithium Li	mg/L			0.0054	0.0030	0.0030	
Magnesium Mg	mg/L			9.3	7.4	7.4	
Manganese Mn	mg/L			0.028	0.021	0.025	
Mercury Hg	mg/L		0.0001	0.0000107	0.00000138	0.0000010	1%
Molybdenum Mo	mg/L		0.073	0.0090	0.00077	0.00051	1%
Nickel Ni	mg/L	0.5	0.025	0.008	0.0010	0.0009	4%
Phosphorus P	mg/L			0.271	0.037	0.034	
Potassium K	mg/L			41	5.5	4.2	
Selenium Se	mg/L		0.001	0.00081	0.0009	0.00085	90%
Silicon SiO2	mg/L			4.0	0.75	0.65	
Silver Ag	mg/L		0.0001	0.00012	0.0000103	0.0000082	10%
Sodium Na	mg/L			293	57	48	
Strontium Sr	mg/L			0.089	0.044	0.048	
Tellurium Te	mg/L			0.039	0.050	0.051	
Thallium Tl	mg/L		0.0008	0.000042	0.000031	0.0020	4%
Thorium Th	mg/L			0.000053	0.0000054	0.0000028	
Tin Sn	mg/L			0.00262	0.00056	0.00010	
Titanium Ti	mg/L			0.0104	0.0063	0.0064	
Uranium U	mg/L			0.000080	0.000042	0.000046	
Vanadium V	mg/L			0.0039	0.0008	0.0006	
Zinc Zn	mg/L	0.5	0.03	0.023	0.0043	0.0058	14%
Zirconium Zr	mg/L			0.0045	0.0050	0.0052	

Table H-1-A-2
Scenario 4

Water Quality in TAIL LAKE

Date		Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter													
TDS	mg/L	92	124	156	201	212	233	261	281	298	318	337	353
TSS	mg/L	1.6	1.6	1.6	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3
Free CN	mg/L	0.00050	0.00096	0.00141	0.00044	0.00040	0.00039	0.00037	0.00037	0.00072	0.00106	0.00139	0.00167
Total CN	mg/L	0.006	0.010	0.015	0.005	0.004	0.004	0.004	0.004	0.007	0.010	0.013	0.016
WAD CN	mg/L	0.0007	0.0013	0.0019	0.0006	0.0005	0.0005	0.0005	0.0005	0.0010	0.0014	0.0018	0.0022
CNO	mg/L	0.55	1.06	1.55	0.49	0.44	0.43	0.41	0.41	0.79	1.16	1.53	1.84
SCN	mg/L	0.008	0.014	0.021	0.027	0.030	0.034	0.040	0.044	0.048	0.052	0.056	0.060
Sulphate	mg/L	7.5	13.4	19.3	26.4	29.2	33.5	38.6	42.4	45.6	49.2	52.7	55.7
Chloride	mg/L	37	57	77	109	121	136	155	168	179	191	202	212
Total Ammonia	mg/L	0.070	0.133	0.194	0.633	0.230	0.210	0.211	0.191	0.233	0.276	0.318	0.354
Nitrate	mg/L	0.35	0.58	0.80	1.57	1.94	2.27	2.68	2.94	3.01	3.12	3.22	3.30
Nitrite	mg/L	0.054	0.102	0.150	0.222	0.200	0.192	0.191	0.187	0.218	0.251	0.283	0.310
Alkalinity	mg/L	16	18	21	27	28	29	32	33	35	36	37	39
OrthoPhosphate-P	mg/L	0.0107	0.0195	0.0282	0.0364	0.0395	0.0455	0.0523	0.0579	0.0629	0.0684	0.0737	0.0783
Phosphate-P	mg/L	0.0142	0.0229	0.0315	0.0406	0.0434	0.0492	0.0561	0.0615	0.0664	0.0718	0.0771	0.0816
Org. Carbon	mg/L	3.0	2.9	2.8	3.6	3.6	3.5	3.6	3.5	3.4	3.3	3.3	3.2
Hardness CaCO3	mg/L	23	29	35	45	47	51	57	60	63	66	70	73
Total Metals													
Aluminum Al	mg/L	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Antimony Sb	mg/L	0.0007	0.0012	0.0018	0.0037	0.0045	0.0051	0.0059	0.0063	0.0065	0.0068	0.0070	0.0073
Arsenic As	mg/L	0.0003	0.0004	0.0006	0.0009	0.0010	0.0011	0.0013	0.0014	0.0014	0.0015	0.0016	0.0017
Barium Ba	mg/L	0.0015	0.0022	0.0028	0.0037	0.0039	0.0044	0.0049	0.0053	0.0057	0.0061	0.0064	0.0067
Beryllium Be	mg/L	0.00012	0.00014	0.00016	0.00025	0.00027	0.00029	0.00032	0.00033	0.00033	0.00034	0.00035	0.00036
Bismuth Bi	mg/L	0.00057	0.00108	0.00159	0.00346	0.00423	0.00480	0.00557	0.00594	0.00614	0.00640	0.00666	0.00687
Boron B	mg/L	0.007	0.008	0.009	0.013	0.014	0.015	0.017	0.017	0.018	0.018	0.019	0.019
Cadmium Cd	mg/L	0.0000044	0.0000075	0.0000105	0.0000171	0.0000196	0.0000222	0.0000256	0.0000277	0.0000292	0.0000309	0.0000326	0.0000341
Calcium Ca	mg/L	21	38	54	71	77	88	101	112	121	132	142	151
Chromium Cr	mg/L	0.001	0.001	0.001	0.002	0.002	0.002	0.003	0.003	0.003	0.004	0.004	0.004
Cobalt Co	mg/L	0.0008	0.0015	0.0022	0.0029	0.0032	0.0037	0.0042	0.0047	0.0051	0.0055	0.0059	0.0063
Copper Cu	mg/L	0.0011	0.0017	0.0023	0.0030	0.0032	0.0036	0.0041	0.0045	0.0048	0.0052	0.0055	0.0058
Iron Fe	mg/L	0.02	0.02	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Lead Pb	mg/L	0.00005	0.00007	0.00009	0.00014	0.00016	0.00018	0.00020	0.00021	0.00022	0.00023	0.00024	0.00025
Lithium Li	mg/L	0.0019	0.0020	0.0022	0.0029	0.0029	0.0031	0.0033	0.0034	0.0034	0.0035	0.0035	0.0036
Magnesium Mg	mg/L	2.5	2.9	3.3	4.4	4.6	4.9	5.4	5.6	5.8	6.0	6.2	6.4
Manganese Mn	mg/L	0.002	0.004	0.006	0.008	0.009	0.010	0.012	0.013	0.014	0.015	0.016	0.017
Mercury Hg	mg/L	0.0000006	0.0000010	0.0000013	0.0000019	0.0000022	0.0000024	0.0000028	0.0000030	0.0000031	0.0000033	0.0000034	0.0000036
Molybdenum Mo	mg/L	0.00072	0.00134	0.00194	0.00252	0.00275	0.00316	0.00364	0.00403	0.00437	0.00476	0.00513	0.00545
Nickel Ni	mg/L	0.0008	0.0013	0.0019	0.0026	0.0028	0.0032	0.0036	0.0039	0.0042	0.0045	0.0048	0.0051
Phosphorus P	mg/L	0.020	0.033	0.047	0.065	0.071	0.081	0.093	0.102	0.109	0.117	0.126	0.133
Potassium K	mg/L	3.8	6.6	9.3	12.1	13.1	14.9	17.1	18.9	20.4	22.1	23.8	25.2
Selenium Se	mg/L	0.00022	0.00023	0.00024	0.00032	0.00032	0.00033	0.00035	0.00035	0.00035	0.00036	0.00036	0.00037
Silicon SiO2	mg/L	0.70	0.92	1.14	1.51	1.59	1.75	1.96	2.09	2.20	2.33	2.46	2.57
Silver Ag	mg/L	0.0000525	0.0000537	0.0000548	0.0000782	0.0000802	0.0000807	0.0000842	0.0000843	0.0000835	0.0000836	0.0000838	0.0000838
Sodium Na	mg/L	11	13	16	20	21	23	25	26	28	29	30	32
Strontium Sr	mg/L	0.017	0.021	0.026	0.034	0.036	0.040	0.044	0.047	0.050	0.053	0.055	0.058
Tellurium Te	mg/L	0.025	0.024	0.024	0.030	0.029	0.029	0.030	0.029	0.028	0.028	0.027	0.027
Thallium Tl	mg/L	0.000017	0.000018	0.000019	0.000026	0.000026	0.000027	0.000029	0.000030	0.000030	0.000031	0.000031	0.000032
Thorium Th	mg/L				0.000007	0.000010	0.000011	0.000013	0.000013	0.000013	0.000013	0.000012	0.000012
Tin Sn	mg/L	0.00013	0.00021	0.00028	0.00058	0.00071	0.00080	0.00093	0.00098	0.00101	0.00104	0.00108	0.00111
Titanium Ti	mg/L	0.0030	0.0030	0.0029	0.0039	0.0038	0.0038	0.0040	0.0039	0.0038	0.0038	0.0037	0.0037
Uranium U	mg/L	0.000025	0.000025	0.000024	0.000038	0.000040	0.000040	0.000042	0.000042	0.000040	0.000040	0.000039	0.000038
Vanadium V	mg/L	0.0004	0.0006	0.0007	0.0011	0.0013	0.0014	0.0016	0.0017	0.0017	0.0018	0.0019	0.0020
Zinc Zn	mg/L	0.0020	0.0034	0.0049	0.0066	0.0072	0.0083	0.0097	0.0106	0.0114	0.0123	0.0132	0.0139
Zirconium Zr	mg/L	0.0025	0.0024	0.0023	0.0032	0.0031	0.0031	0.0032	0.0032	0.0031	0.0030	0.0029	0.0029

Table H-1-A-2
Scenario 4

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter													
TDS	mg/L	372	388	405	364	381	422	443	478	501	518	535	548
TSS	mg/L	2.3	2.3	2.3	2.2	2.3	2.5	2.6	2.7	2.7	2.7	2.7	2.7
Free CN	mg/L	0.00198	0.00226	0.00255		0.00035	0.00036	0.00036	0.00040	0.00078	0.00116	0.00152	0.00183
Total CN	mg/L	0.019	0.022	0.025		0.003	0.003	0.003	0.004	0.008	0.011	0.015	0.018
WAD CN	mg/L	0.0026	0.0030	0.0034		0.0005	0.0005	0.0005	0.0005	0.0010	0.0015	0.0020	0.0024
CNO	mg/L	2.18	2.49	2.80		0.38	0.39	0.39	0.44	0.86	1.28	1.67	2.01
SCN	mg/L	0.064	0.067	0.071	0.063	0.065	0.073	0.077	0.084	0.089	0.092	0.096	0.099
Sulphate	mg/L	59.1	62.1	65.2	58.5	61.5	68.7	72.6	78.8	82.9	86.0	89.0	91.5
Chloride	mg/L	223	233	243	222	236	263	277	300	313	323	333	341
Total Ammonia	mg/L	0.394	0.430	0.466	0.399	0.203	0.194	0.193	0.244	0.292	0.337	0.377	0.377
Nitrate	mg/L	3.40	3.49	3.58	3.70	4.01	4.67	4.96	5.38	5.51	5.56	5.62	5.66
Nitrite	mg/L	0.340	0.368	0.395	0.125	0.169	0.033	0.195	0.197	0.236	0.272	0.306	0.336
Alkalinity	mg/L	40	41	43	39	41	45	47	51	52	54	55	56
OrthoPhosphate-P	mg/L	0.0834	0.0880	0.0926	0.0817	0.0853	0.0952	0.1004	0.1093	0.1155	0.1203	0.1249	0.1288
Phosphate-P	mg/L	0.0866	0.0911	0.0957	0.0850	0.0885	0.0986	0.1038	0.1126	0.1188	0.1235	0.1281	0.1320
Org. Carbon	mg/L	3.1	3.1	3.0	3.1	3.3	3.5	3.5	3.6	3.5	3.5	3.4	3.3
Hardness CaCO3	mg/L	76	79	82	74	78	86	90	97	101	104	107	109
Total Metals													
Aluminum Al	mg/L	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05
Antimony Sb	mg/L	0.0076	0.0078	0.0080	0.0079	0.0087	0.0097	0.0104	0.0111	0.0114	0.0116	0.0118	0.0120
Arsenic As	mg/L	0.0018	0.0019	0.0020	0.0018	0.0019	0.0021	0.0023	0.0024	0.0025	0.0026	0.0027	0.0028
Barium Ba	mg/L	0.0071	0.0074	0.0077	0.0070	0.0073	0.0081	0.0086	0.0093	0.0097	0.0100	0.0103	0.0106
Beryllium Be	mg/L	0.00037	0.00037	0.00038	0.00038	0.00041	0.00045	0.00047	0.00050	0.00051	0.00051	0.00052	0.00052
Bismuth Bi	mg/L	0.00712	0.00734	0.00756	0.00750	0.00824	0.00922	0.00983	0.01052	0.01083	0.01101	0.01118	0.01132
Boron B	mg/L	0.020	0.020	0.021	0.020	0.021	0.023	0.025	0.026	0.027	0.027	0.027	0.028
Cadmium Cd	mg/L	0.0000358	0.0000373	0.0000387	0.0000364	0.0000390	0.0000435	0.0000461	0.0000497	0.0000518	0.0000532	0.0000545	0.0000557
Calcium Ca	mg/L	160	169	178	157	164	183	194	210	222	231	240	248
Chromium Cr	mg/L	0.004	0.005	0.005	0.004	0.004	0.005	0.005	0.006	0.006	0.006	0.006	0.007
Cobalt Co	mg/L	0.0067	0.0070	0.0074	0.0066	0.0069	0.0077	0.0081	0.0088	0.0093	0.0097	0.0100	0.0103
Copper Cu	mg/L	0.0062	0.0065	0.0068	0.0061	0.0064	0.0071	0.0075	0.0081	0.0085	0.0088	0.0091	0.0094
Iron Fe	mg/L	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00026	0.00027	0.00028	0.00027	0.00029	0.00032	0.00034	0.00036	0.00037	0.00038	0.00039	0.00040
Lithium Li	mg/L	0.0037	0.0037	0.0038	0.0036	0.0038	0.0042	0.0044	0.0046	0.0047	0.0048	0.0048	0.0049
Magnesium Mg	mg/L	6.6	6.8	7.0	6.5	6.9	7.6	8.0	8.5	8.8	8.9	9.1	9.3
Manganese Mn	mg/L	0.018	0.019	0.020	0.018	0.019	0.021	0.022	0.024	0.026	0.027	0.028	0.028
Mercury Hg	mg/L	0.0000038	0.0000039	0.0000041	0.0000038	0.0000041	0.0000045	0.0000048	0.0000051	0.0000053	0.0000055	0.0000056	0.0000057
Molybdenum Mo	mg/L	0.00580	0.00612	0.00644	0.00569	0.00594	0.00663	0.00700	0.00761	0.00805	0.00838	0.00870	0.00897
Nickel Ni	mg/L	0.0054	0.0057	0.0059	0.0053	0.0056	0.0063	0.0066	0.0072	0.0075	0.0078	0.0080	0.0083
Phosphorus P	mg/L	0.140	0.147	0.154	0.139	0.146	0.163	0.172	0.187	0.196	0.203	0.210	0.216
Potassium K	mg/L	26.8	28.3	29.7	26.3	27.5	30.6	32.3	35.1	37.0	38.5	40.0	41.2
Selenium Se	mg/L	0.00037	0.00037	0.00038	0.00037	0.00039	0.00043	0.00044	0.00046	0.00047	0.00047	0.00047	0.00047
Silicon SiO2	mg/L	2.70	2.80	2.91	2.66	2.79	3.09	3.25	3.49	3.65	3.76	3.86	3.95
Silver Ag	mg/L	0.0000841	0.0000842	0.0000844	0.0000857	0.0000927	0.0000993	0.0001013	0.0001053	0.0001062	0.0001058	0.0001054	0.0001050
Sodium Na	mg/L	33	34	35	32	34	37	39	42	44	45	46	47
Strontium Sr	mg/L	0.061	0.063	0.066	0.059	0.063	0.069	0.073	0.078	0.082	0.084	0.087	0.089
Tellurium Te	mg/L	0.026	0.026	0.025	0.025	0.027	0.029	0.029	0.030	0.029	0.029	0.028	0.027
Thallium Tl	mg/L	0.000032	0.000033	0.000033	0.000032	0.000034	0.000037	0.000039	0.000041	0.000042	0.000042	0.000042	0.000042
Thorium Th	mg/L	0.000012	0.000012	0.000011	0.000014	0.000017	0.000019	0.000021	0.000022	0.000021	0.000021	0.000020	0.000020
Tin Sn	mg/L	0.00115	0.00118	0.00121	0.00120	0.00133	0.00148	0.00158	0.00169	0.00173	0.00176	0.00178	0.00180
Titanium Ti	mg/L	0.0036	0.0036	0.0035	0.0036	0.0038	0.0041	0.0042	0.0043	0.0043	0.0042	0.0041	0.0041
Uranium U	mg/L	0.000038	0.000037	0.000036	0.000040	0.000044	0.000047	0.000048	0.000050	0.000049	0.000048	0.000047	0.000046
Vanadium V	mg/L	0.0020	0.0021	0.0022	0.0021	0.0023	0.0025	0.0026	0.0028	0.0029	0.0030	0.0030	0.0031
Zinc Zn	mg/L	0.0147	0.0155	0.0162	0.0145	0.0152	0.0170	0.0181	0.0197	0.0207	0.0214	0.0221	0.0228
Zirconium Zr	mg/L	0.0028	0.0028	0.0027	0.0028	0.0030	0.0032	0.0033	0.0034	0.0033	0.0033	0.0032	0.0031

Table H-1-A-2
Scenario 4

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter													
TDS	mg/L	556	569	582	624	758	958	1116	1319	1349	1358	1368	1377
TSS	mg/L	2.7	2.7	2.6	2.7	2.9	3.1	3.1	3.2	3.2	3.2	3.2	3.1
Free CN	mg/L	0.00180	0.00179	0.00177									
Total CN	mg/L	0.017	0.017	0.017		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L	0.0024	0.0024	0.0024									
CNO	mg/L	1.98	1.96	1.95									
SCN	mg/L	0.097	0.097	0.096	0.077	0.074	0.077	0.075	0.076	0.077	0.076	0.075	0.075
Sulphate	mg/L	90.4	90.2	90.0	74.4	72.7	76.4	75.7	77.6	78.6	78.4	78.3	78.3
Chloride	mg/L	352	366	379	415	509	643	748	883	909	921	934	947
Total Ammonia	mg/L	0.379	0.384	0.390	0.634		0.023	0.027	0.017	0.027	0.037	0.048	0.057
Nitrate	mg/L	5.49	5.39	5.28	4.84	4.87	5.36	5.40	5.58	5.53	5.40	5.28	5.16
Nitrite	mg/L	0.352	0.371	0.390	0.105	0.172	0.018	0.030	0.031	0.058	0.086	0.112	0.136
Alkalinity	mg/L	55	54	54	46	46	49	48	49	49	49	48	48
OrthoPhosphate-P	mg/L	0.1339	0.1399	0.1461	0.1248	0.1272	0.1406	0.1458	0.1573	0.1672	0.1748	0.1824	0.1892
Phosphate-P	mg/L	0.1369	0.1430	0.1491	0.1294	0.1325	0.1463	0.1518	0.1635	0.1734	0.1809	0.1885	0.1953
Org. Carbon	mg/L	3.2	3.2	3.2	3.3	3.5	3.8	3.8	3.9	3.9	3.9	3.9	3.8
Hardness CaCO3	mg/L	107	107	106	89	88	92	91	92	93	92	91	91
Total Metals													
Aluminum Al	mg/L	0.05	0.05	0.05	0.06	0.07	0.08	0.08	0.08	0.09	0.08	0.08	0.08
Antimony Sb	mg/L	0.0122	0.0125	0.0128	0.0118	0.0125	0.0138	0.0145	0.0154	0.0160	0.0164	0.0167	0.0171
Arsenic As	mg/L	0.0027	0.0027	0.0027	0.0023	0.0023	0.0024	0.0024	0.0025	0.0025	0.0025	0.0025	0.0025
Barium Ba	mg/L	0.0104	0.0104	0.0103	0.0086	0.0084	0.0088	0.0087	0.0089	0.0090	0.0089	0.0089	0.0088
Beryllium Be	mg/L	0.00052	0.00053	0.00054	0.00050	0.00052	0.00057	0.00058	0.00061	0.00062	0.00063	0.00064	0.00064
Bismuth Bi	mg/L	0.01153	0.01185	0.01217	0.01132	0.01201	0.01329	0.01393	0.01483	0.01543	0.01581	0.01619	0.01654
Boron B	mg/L	0.027	0.027	0.027	0.027	0.029	0.031	0.032	0.033	0.033	0.033	0.033	0.033
Cadmium Cd	mg/L	0.0000548	0.0000544	0.0000541	0.0000463	0.0000459	0.0000484	0.0000482	0.0000493	0.0000497	0.0000493	0.0000489	0.0000486
Calcium Ca	mg/L	243	242	240	202	202	219	224	237	239	236	235	233
Chromium Cr	mg/L	0.006	0.006	0.006	0.005	0.005	0.006	0.005	0.006	0.006	0.006	0.006	0.006
Cobalt Co	mg/L	0.0102	0.0101	0.0101	0.0082	0.0080	0.0083	0.0082	0.0083	0.0084	0.0083	0.0083	0.0083
Copper Cu	mg/L	0.0092	0.0092	0.0091	0.0076	0.0073	0.0077	0.0075	0.0077	0.0077	0.0077	0.0076	0.0076
Iron Fe	mg/L	0.05	0.05	0.05	0.07	0.07	0.08	0.09	0.09	0.09	0.09	0.09	0.09
Lead Pb	mg/L	0.00039	0.00040	0.00040	0.00035	0.00036	0.00038	0.00039	0.00040	0.00041	0.00041	0.00041	0.00041
Lithium Li	mg/L	0.0048	0.0048	0.0048	0.0045	0.0046	0.0049	0.0050	0.0052	0.0052	0.0052	0.0052	0.0052
Magnesium Mg	mg/L	9.1	9.1	9.1	8.2	8.4	8.9	9.0	9.2	9.3	9.3	9.3	9.3
Manganese Mn	mg/L	0.028	0.028	0.028	0.023	0.023	0.024	0.023	0.024	0.024	0.024	0.024	0.024
Mercury Hg	mg/L	0.0000057	0.0000056	0.0000056	0.0000062	0.0000068	0.0000074	0.0000077	0.0000079	0.0000080	0.0000079	0.0000079	0.0000078
Molybdenum Mo	mg/L	0.00883	0.00877	0.00871	0.00708	0.00680	0.00708	0.00693	0.00704	0.00709	0.00703	0.00697	0.00693
Nickel Ni	mg/L	0.0082	0.0082	0.0081	0.0068	0.0067	0.0070	0.0070	0.0071	0.0072	0.0072	0.0072	0.0072
Phosphorus P	mg/L	0.220	0.226	0.233	0.199	0.200	0.218	0.223	0.237	0.248	0.256	0.264	0.271
Potassium K	mg/L	40.5	40.2	40.0	32.6	31.5	32.7	32.1	32.6	32.8	32.5	32.3	32.0
Selenium Se	mg/L	0.00046	0.00046	0.00046	0.00050	0.00054	0.00058	0.00060	0.00062	0.00062	0.00061	0.00061	0.00060
Silicon SiO2	mg/L	3.89	3.87	3.84	3.27	3.23	3.39	3.36	3.43	3.45	3.42	3.40	3.38
Silver Ag	mg/L	0.0001040	0.0001041	0.0001042	0.0001013	0.0001069	0.0001135	0.0001139	0.0001174	0.0001192	0.0001191	0.0001191	0.0001192
Sodium Na	mg/L	46	46	46	84	128	183	233	291	293	290	287	285
Strontium Sr	mg/L	0.087	0.087	0.086	0.074	0.073	0.077	0.076	0.078	0.078	0.078	0.077	0.077
Tellurium Te	mg/L	0.027	0.027	0.026	0.027	0.029	0.031	0.031	0.032	0.033	0.032	0.032	0.032
Thallium Tl	mg/L	0.000042	0.000041	0.000041	0.000037	0.000038	0.000040	0.000041	0.000042	0.000042	0.000041	0.000041	0.000041
Thorium Th	mg/L	0.000019	0.000019	0.000019	0.000024	0.000028	0.000031	0.000033	0.000034	0.000034	0.000034	0.000034	0.000034
Tin Sn	mg/L	0.00183	0.00187	0.00192	0.00179	0.00192	0.00212	0.00222	0.00237	0.00246	0.00251	0.00257	0.00262
Titanium Ti	mg/L	0.0040	0.0040	0.0040	0.0050	0.0058	0.0063	0.0066	0.0069	0.0069	0.0069	0.0069	0.0068
Uranium U	mg/L	0.000046	0.000046	0.000045	0.000049	0.000054	0.000058	0.000059	0.000061	0.000062	0.000061	0.000061	0.000061
Vanadium V	mg/L	0.0031	0.0031	0.0032	0.0030	0.0032	0.0034	0.0035	0.0037	0.0038	0.0039	0.0039	0.0039
Zinc Zn	mg/L	0.0224	0.0224	0.0223	0.0184	0.0180	0.0189	0.0189	0.0193	0.0195	0.0194	0.0194	0.0193
Zirconium Zr	mg/L	0.0031	0.0030	0.0030	0.0031	0.0033	0.0035	0.0036	0.0037	0.0037	0.0037	0.0037	0.0036

Table H-1-A-2
Scenario 4

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter													
TDS	mg/L	1368	1362	1356	1050	1001	1054	1028	1056	1072	1065	1059	1055
TSS	mg/L	3.1	3.1	3.1	3.1	3.3	3.6	3.6	3.8	3.8	3.8	3.8	3.8
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.074	0.074	0.074	0.056	0.053	0.056	0.054	0.056	0.056	0.056	0.056	0.056
Sulphate	mg/L	77.7	77.4	77.0	59.1	56.1	59.0	57.4	58.9	59.8	59.4	59.1	58.9
Chloride	mg/L	940	936	932	722	689	726	708	727	739	734	730	727
Total Ammonia	mg/L	0.056	0.056	0.056	0.012	0.015	0.007	0.011	0.004	0.004	0.004	0.004	0.004
Nitrate	mg/L	5.04	4.93	4.82	4.00	3.91	4.18	4.14	4.28	4.24	4.10	3.97	3.85
Nitrite	mg/L	0.135	0.135	0.134		0.005	0.003	0.003	0.002	0.002	0.002	0.002	0.002
Alkalinity	mg/L	48	48	47	40	40	43	42	44	44	44	44	44
OrthoPhosphate-P	mg/L	0.1879	0.1871	0.1862	0.1423	0.1346	0.1415	0.1374	0.1410	0.1432	0.1422	0.1414	0.1409
Phosphate-P	mg/L	0.1939	0.1931	0.1922	0.1496	0.1427	0.1504	0.1465	0.1505	0.1528	0.1517	0.1509	0.1503
Org. Carbon	mg/L	3.8	3.8	3.8	3.8	4.1	4.4	4.5	4.7	4.7	4.7	4.7	4.7
Hardness CaCO3	mg/L	90	90	89	73	72	77	76	78	79	79	78	78
Total Metals													
Aluminum Al	mg/L	0.08	0.08	0.08	0.09	0.10	0.11	0.12	0.12	0.12	0.12	0.12	0.12
Antimony Sb	mg/L	0.0170	0.0169	0.0168	0.0129	0.0122	0.0128	0.0125	0.0128	0.0130	0.0129	0.0128	0.0128
Arsenic As	mg/L	0.0024	0.0024	0.0024	0.0020	0.0019	0.0020	0.0020	0.0021	0.0021	0.0021	0.0021	0.0021
Barium Ba	mg/L	0.0088	0.0087	0.0087	0.0069	0.0067	0.0071	0.0069	0.0071	0.0073	0.0072	0.0072	0.0071
Beryllium Be	mg/L	0.00064	0.00064	0.00063	0.00052	0.00051	0.00054	0.00053	0.00054	0.00055	0.00055	0.00055	0.00054
Bismuth Bi	mg/L	0.01642	0.01635	0.01628	0.01242	0.01175	0.01235	0.01199	0.01230	0.01249	0.01241	0.01234	0.01229
Boron B	mg/L	0.033	0.033	0.033	0.030	0.031	0.034	0.034	0.036	0.036	0.036	0.036	0.036
Cadmium Cd	mg/L	0.0000483	0.0000480	0.0000478	0.0000397	0.0000396	0.0000425	0.0000425	0.0000440	0.0000447	0.0000444	0.0000441	0.0000440
Calcium Ca	mg/L	231	230	229	176	167	176	171	175	178	177	176	175
Chromium Cr	mg/L	0.006	0.006	0.006	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Cobalt Co	mg/L	0.0082	0.0082	0.0081	0.0062	0.0059	0.0062	0.0060	0.0062	0.0063	0.0063	0.0062	0.0062
Copper Cu	mg/L	0.0075	0.0075	0.0075	0.0059	0.0057	0.0060	0.0059	0.0061	0.0062	0.0061	0.0061	0.0061
Iron Fe	mg/L	0.09	0.09	0.09	0.10	0.11	0.12	0.12	0.13	0.13	0.13	0.13	0.13
Lead Pb	mg/L	0.00041	0.00041	0.00041	0.00033	0.00032	0.00035	0.00034	0.00035	0.00036	0.00035	0.00035	0.00035
Lithium Li	mg/L	0.0051	0.0051	0.0051	0.0046	0.0047	0.0051	0.0051	0.0053	0.0054	0.0053	0.0053	0.0053
Magnesium Mg	mg/L	9.2	9.2	9.1	7.9	7.9	8.6	8.5	8.8	9.0	8.9	8.9	8.8
Manganese Mn	mg/L	0.024	0.023	0.023	0.018	0.018	0.019	0.019	0.019	0.019	0.019	0.019	0.019
Mercury Hg	mg/L	0.0000078	0.0000077	0.0000077	0.0000080	0.0000087	0.0000096	0.0000098	0.0000103	0.0000104	0.0000104	0.0000103	0.0000103
Molybdenum Mo	mg/L	0.00688	0.00685	0.00682	0.00524	0.00498	0.00524	0.00509	0.00523	0.00531	0.00528	0.00525	0.00523
Nickel Ni	mg/L	0.0072	0.0071	0.0071	0.0055	0.0053	0.0056	0.0054	0.0056	0.0057	0.0056	0.0056	0.0056
Phosphorus P	mg/L	0.269	0.268	0.266	0.206	0.196	0.206	0.201	0.206	0.209	0.208	0.207	0.206
Potassium K	mg/L	31.8	31.7	31.5	24.5	23.4	24.7	24.1	24.8	25.2	25.0	24.8	24.7
Selenium Se	mg/L	0.00060	0.00060	0.00059	0.00061	0.00067	0.00073	0.00075	0.00078	0.00079	0.00078	0.00078	0.00078
Silicon SiO2	mg/L	3.35	3.34	3.32	2.74	2.70	2.88	2.85	2.94	2.99	2.97	2.95	2.94
Silver Ag	mg/L	0.0001183	0.0001178	0.0001173	0.0001076	0.0001116	0.0001184	0.0001165	0.0001201	0.0001219	0.0001211	0.0001204	0.0001200
Sodium Na	mg/L	283	282	281	221	212	224	219	226	229	228	226	225
Strontium Sr	mg/L	0.076	0.076	0.076	0.062	0.062	0.066	0.066	0.068	0.069	0.068	0.068	0.068
Tellurium Te	mg/L	0.031	0.031	0.031	0.031	0.033	0.036	0.037	0.038	0.039	0.039	0.038	0.038
Thallium Tl	mg/L	0.000041	0.000040	0.000040	0.000036	0.000037	0.000040	0.000040	0.000042	0.000042	0.000042	0.000042	0.000042
Thorium Th	mg/L	0.000033	0.000033	0.000033	0.000036	0.000041	0.000045	0.000047	0.000050	0.000051	0.000050	0.000050	0.000050
Tin Sn	mg/L	0.00260	0.00259	0.00258	0.00199	0.00191	0.00202	0.00198	0.00203	0.00206	0.00205	0.00204	0.00203
Titanium Ti	mg/L	0.0068	0.0068	0.0067	0.0073	0.0081	0.0089	0.0092	0.0096	0.0097	0.0097	0.0096	0.0096
Uranium U	mg/L	0.000060	0.000060	0.000060	0.000061	0.000067	0.000073	0.000074	0.000077	0.000078	0.000077	0.000077	0.000077
Vanadium V	mg/L	0.0039	0.0039	0.0039	0.0032	0.0032	0.0034	0.0034	0.0035	0.0035	0.0035	0.0035	0.0035
Zinc Zn	mg/L	0.0192	0.0191	0.0190	0.0148	0.0141	0.0149	0.0148	0.0153	0.0156	0.0155	0.0154	0.0153
Zirconium Zr	mg/L	0.0036	0.0036	0.0036	0.0035	0.0038	0.0041	0.0042	0.0044	0.0045	0.0044	0.0044	0.0044

Table H-1-A-2
Scenario 4

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter													
TDS	mg/L	1051	1045	1039	721	671	567	502	462	469	466	463	462
TSS	mg/L	3.8	3.7	3.7	3.5	3.7	3.3	3.1	2.9	2.9	2.9	2.9	2.9
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.055	0.055	0.055	0.037	0.034	0.028	0.025	0.023	0.023	0.023	0.023	0.023
Sulphate	mg/L	58.6	58.3	58.0	39.4	36.3	30.6	27.0	24.8	25.2	25.0	24.9	24.8
Chloride	mg/L	724	720	716	497	464	392	348	320	325	323	321	320
Total Ammonia	mg/L	0.004	0.004	0.004	0.034	0.017	0.008	0.012	0.004	0.004	0.004	0.004	0.004
Nitrate	mg/L	3.73	3.60	3.47	2.61	2.57	2.24	2.06	1.93	1.85	1.73	1.61	1.50
Nitrite	mg/L	0.002	0.002	0.002	0.006	0.007	0.003	0.003	0.002	0.002	0.002	0.002	0.002
Alkalinity	mg/L	43	43	43	34	35	30	27	25	26	25	25	25
OrthoPhosphate-P	mg/L	0.1403	0.1396	0.1388	0.0936	0.0857	0.0720	0.0633	0.0581	0.0590	0.0586	0.0582	0.0580
Phosphate-P	mg/L	0.1497	0.1490	0.1481	0.1038	0.0967	0.0817	0.0723	0.0665	0.0675	0.0671	0.0667	0.0665
Org. Carbon	mg/L	4.6	4.6	4.6	4.3	4.7	4.2	3.9	3.6	3.6	3.6	3.6	3.6
Hardness CaCO3	mg/L	78	77	77	58	58	50	45	42	43	42	42	42
Total Metals													
Aluminum Al	mg/L	0.12	0.12	0.12	0.12	0.13	0.12	0.11	0.10	0.10	0.10	0.10	0.10
Antimony Sb	mg/L	0.0127	0.0127	0.0126	0.0085	0.0078	0.0066	0.0058	0.0053	0.0054	0.0054	0.0054	0.0053
Arsenic As	mg/L	0.0021	0.0021	0.0020	0.0015	0.0015	0.0013	0.0012	0.0011	0.0011	0.0011	0.0011	0.0011
Barium Ba	mg/L	0.0071	0.0071	0.0070	0.0051	0.0049	0.0042	0.0038	0.0035	0.0035	0.0035	0.0035	0.0035
Beryllium Be	mg/L	0.00054	0.00054	0.00054	0.00041	0.00041	0.00035	0.00031	0.00028	0.00029	0.00029	0.00028	0.00028
Bismuth Bi	mg/L	0.01224	0.01218	0.01211	0.00815	0.00745	0.00626	0.00550	0.00505	0.00513	0.00509	0.00506	0.00504
Boron B	mg/L	0.035	0.035	0.035	0.031	0.032	0.029	0.027	0.025	0.025	0.025	0.025	0.025
Cadmium Cd	mg/L	0.0000438	0.0000436	0.0000433	0.0000337	0.0000337	0.0000294	0.0000271	0.0000253	0.0000257	0.0000255	0.0000254	0.0000253
Calcium Ca	mg/L	174	174	173	117	108	91	80	74	75	74	74	74
Chromium Cr	mg/L	0.004	0.004	0.004	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Cobalt Co	mg/L	0.0062	0.0061	0.0061	0.0042	0.0038	0.0032	0.0028	0.0026	0.0026	0.0026	0.0026	0.0026
Copper Cu	mg/L	0.0060	0.0060	0.0060	0.0043	0.0041	0.0035	0.0031	0.0029	0.0029	0.0029	0.0029	0.0029
Iron Fe	mg/L	0.13	0.13	0.13	0.13	0.14	0.12	0.12	0.11	0.11	0.11	0.11	0.11
Lead Pb	mg/L	0.00035	0.00035	0.00035	0.00026	0.00025	0.00022	0.00020	0.00018	0.00019	0.00019	0.00018	0.00018
Lithium Li	mg/L	0.0053	0.0052	0.0052	0.0045	0.0047	0.0041	0.0038	0.0035	0.0036	0.0035	0.0035	0.0035
Magnesium Mg	mg/L	8.8	8.8	8.7	7.1	7.3	6.4	5.9	5.4	5.5	5.5	5.5	5.4
Manganese Mn	mg/L	0.019	0.019	0.019	0.014	0.013	0.011	0.010	0.009	0.009	0.009	0.009	0.009
Mercury Hg	mg/L	0.0000102	0.0000102	0.0000101	0.0000098	0.0000107	0.0000095	0.0000089	0.0000083	0.0000085	0.0000084	0.0000084	0.0000083
Molybdenum Mo	mg/L	0.00521	0.00518	0.00515	0.00352	0.00325	0.00274	0.00241	0.00222	0.00225	0.00224	0.00222	0.00222
Nickel Ni	mg/L	0.0055	0.0055	0.0055	0.0038	0.0036	0.0030	0.0027	0.0025	0.0025	0.0025	0.0025	0.0025
Phosphorus P	mg/L	0.205	0.204	0.203	0.140	0.129	0.109	0.097	0.089	0.090	0.090	0.089	0.089
Potassium K	mg/L	24.7	24.5	24.4	17.1	16.0	13.5	12.0	11.0	11.2	11.1	11.1	11.0
Selenium Se	mg/L	0.00077	0.00077	0.00077	0.00074	0.00081	0.00071	0.00067	0.00062	0.00063	0.00063	0.00063	0.00062
Silicon SiO2	mg/L	2.93	2.91	2.90	2.24	2.21	1.90	1.73	1.61	1.63	1.62	1.61	1.60
Silver Ag	mg/L	0.0001195	0.0001189	0.0001182	0.0001052	0.0001107	0.0000943	0.0000845	0.0000781	0.0000793	0.0000787	0.0000783	0.0000780
Sodium Na	mg/L	225	223	222	159	150	128	114	105	107	106	105	105
Strontium Sr	mg/L	0.067	0.067	0.067	0.051	0.051	0.044	0.040	0.038	0.038	0.038	0.038	0.037
Tellurium Te	mg/L	0.038	0.038	0.038	0.036	0.038	0.034	0.032	0.030	0.030	0.030	0.030	0.029
Thallium Tl	mg/L	0.000042	0.000041	0.000041	0.000035	0.000036	0.000032	0.000030	0.000028	0.000028	0.000028	0.000028	0.000028
Thorium Th	mg/L	0.000050	0.000049	0.000049	0.000048	0.000053	0.000048	0.000046	0.000043	0.000044	0.000044	0.000043	0.000043
Tin Sn	mg/L	0.00202	0.00201	0.00200	0.00138	0.00130	0.00111	0.00099	0.00091	0.00093	0.00092	0.00092	0.00091
Titanium Ti	mg/L	0.0096	0.0095	0.0095	0.0095	0.0104	0.0092	0.0087	0.0081	0.0083	0.0082	0.0082	0.0081
Uranium U	mg/L	0.000076	0.000076	0.000075	0.000073	0.000080	0.000070	0.000065	0.000060	0.000061	0.000061	0.000061	0.000060
Vanadium V	mg/L	0.0035	0.0034	0.0034	0.0027	0.0027	0.0023	0.0021	0.0019	0.0020	0.0020	0.0019	0.0019
Zinc Zn	mg/L	0.0153	0.0152	0.0151	0.0105	0.0099	0.0084	0.0077	0.0072	0.0073	0.0073	0.0072	0.0072
Zirconium Zr	mg/L	0.0044	0.0044	0.0043	0.0041	0.0044	0.0039	0.0036	0.0034	0.0034	0.0034	0.0034	0.0034

Table H-1-A-2
Scenario 4

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter													
TDS	mg/L	460	457	455	331	316	270	242	250	244	243	241	240
TSS	mg/L	2.9	2.9	2.8	2.9	3.2	2.9	2.7	2.8	2.8	2.7	2.7	2.7
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.023	0.022	0.022	0.015	0.014	0.012	0.010	0.011	0.010	0.010	0.010	0.010
Sulphate	mg/L	24.7	24.6	24.4	17.1	16.0	13.5	12.1	12.5	12.2	12.1	12.0	12.0
Chloride	mg/L	319	317	315	230	220	189	169	175	171	170	169	168
Total Ammonia	mg/L	0.004	0.004	0.004	0.033	0.017	0.008	0.012	0.004	0.004	0.004	0.004	0.004
Nitrate	mg/L	1.39	1.27	1.16	1.05	1.15	1.05	1.02	1.09	0.95	0.83	0.72	0.61
Nitrite	mg/L	0.002	0.002	0.002	0.006	0.007	0.003	0.003	0.002	0.002	0.002	0.002	0.002
Alkalinity	mg/L	25	25	25	22	23	21	19	20	19	19	19	19
OrthoPhosphate-P	mg/L	0.0578	0.0575	0.0572	0.0392	0.0361	0.0305	0.0270	0.0277	0.0271	0.0269	0.0267	0.0266
Phosphate-P	mg/L	0.0662	0.0659	0.0655	0.0487	0.0465	0.0397	0.0356	0.0367	0.0359	0.0356	0.0354	0.0353
Org. Carbon	mg/L	3.6	3.6	3.5	3.6	4.1	3.6	3.4	3.5	3.5	3.4	3.4	3.4
Hardness CaCO3	mg/L	42	42	41	35	37	32	30	31	30	30	30	30
Total Metals													
Aluminum Al	mg/L	0.10	0.10	0.10	0.11	0.12	0.11	0.10	0.11	0.11	0.10	0.10	0.10
Antimony Sb	mg/L	0.0053	0.0053	0.0053	0.0036	0.0033	0.0028	0.0025	0.0026	0.0026	0.0025	0.0025	0.0025
Arsenic As	mg/L	0.0011	0.0011	0.0011	0.0009	0.0009	0.0008	0.0007	0.0008	0.0007	0.0007	0.0007	0.0007
Barium Ba	mg/L	0.0034	0.0034	0.0034	0.0027	0.0027	0.0023	0.0021	0.0022	0.0022	0.0022	0.0021	0.0021
Beryllium Be	mg/L	0.00028	0.00028	0.00028	0.00024	0.00025	0.00021	0.00019	0.00020	0.00019	0.00019	0.00019	0.00019
Bismuth Bi	mg/L	0.00502	0.00500	0.00497	0.00339	0.00312	0.00263	0.00232	0.00239	0.00233	0.00232	0.00230	0.00230
Boron B	mg/L	0.025	0.025	0.024	0.024	0.026	0.023	0.022	0.023	0.022	0.022	0.022	0.022
Cadmium Cd	mg/L	0.0000252	0.0000251	0.0000249	0.0000214	0.0000225	0.0000200	0.0000189	0.0000199	0.0000194	0.0000193	0.0000192	0.0000191
Calcium Ca	mg/L	73	73	73	51	47	40	36	37	36	36	36	36
Chromium Cr	mg/L	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Cobalt Co	mg/L	0.0026	0.0026	0.0026	0.0018	0.0017	0.0014	0.0013	0.0013	0.0013	0.0013	0.0012	0.0012
Copper Cu	mg/L	0.0029	0.0029	0.0028	0.0022	0.0022	0.0019	0.0017	0.0018	0.0018	0.0017	0.0017	0.0017
Iron Fe	mg/L	0.11	0.11	0.11	0.11	0.13	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Lead Pb	mg/L	0.00018	0.00018	0.00018	0.00015	0.00015	0.00014	0.00013	0.00013	0.00013	0.00013	0.00013	0.00013
Lithium Li	mg/L	0.0035	0.0035	0.0035	0.0033	0.0036	0.0032	0.0030	0.0031	0.0031	0.0030	0.0030	0.0030
Magnesium Mg	mg/L	5.4	5.4	5.4	4.9	5.2	4.7	4.4	4.6	4.5	4.4	4.4	4.4
Manganese Mn	mg/L	0.009	0.009	0.009	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.006
Mercury Hg	mg/L	0.0000083	0.0000083	0.0000082	0.0000085	0.0000095	0.0000085	0.0000081	0.0000085	0.0000083	0.0000082	0.0000082	0.0000081
Molybdenum Mo	mg/L	0.00221	0.00220	0.00218	0.00154	0.00145	0.00123	0.00109	0.00113	0.00110	0.00109	0.00109	0.00108
Nickel Ni	mg/L	0.0025	0.0025	0.0024	0.0018	0.0017	0.0015	0.0013	0.0014	0.0014	0.0013	0.0013	0.0013
Phosphorus P	mg/L	0.088	0.088	0.088	0.063	0.059	0.051	0.045	0.047	0.046	0.045	0.045	0.045
Potassium K	mg/L	11.0	10.9	10.9	8.0	7.7	6.6	6.0	6.2	6.0	6.0	6.0	5.9
Selenium Se	mg/L	0.00062	0.00062	0.00061	0.00064	0.00071	0.00063	0.00060	0.00063	0.00061	0.00061	0.00061	0.00060
Silicon SiO2	mg/L	1.60	1.59	1.58	1.36	1.41	1.24	1.15	1.20	1.17	1.16	1.15	1.15
Silver Ag	mg/L	0.0000777	0.0000773	0.0000769	0.0000774	0.0000852	0.0000731	0.0000661	0.0000686	0.0000669	0.0000665	0.0000661	0.0000658
Sodium Na	mg/L	105	104	103	79	78	67	61	63	62	62	61	61
Strontium Sr	mg/L	0.037	0.037	0.037	0.032	0.033	0.029	0.027	0.028	0.028	0.028	0.027	0.027
Tellurium Te	mg/L	0.029	0.029	0.029	0.030	0.033	0.029	0.028	0.029	0.028	0.028	0.028	0.028
Thallium Tl	mg/L	0.000028	0.000027	0.000027	0.000026	0.000028	0.000025	0.000024	0.000025	0.000024	0.000024	0.000024	0.000024
Thorium Th	mg/L	0.000043	0.000043	0.000043	0.000044	0.000049	0.000045	0.000043	0.000046	0.000045	0.000044	0.000044	0.000044
Tin Sn	mg/L	0.00091	0.00090	0.00090	0.00065	0.00064	0.00055	0.00050	0.00052	0.00051	0.00050	0.00050	0.00050
Titanium Ti	mg/L	0.0081	0.0081	0.0080	0.0085	0.0085	0.0085	0.0080	0.0084	0.0082	0.0082	0.0081	0.0081
Uranium U	mg/L	0.000060	0.000060	0.000059	0.000062	0.000070	0.000062	0.000058	0.000060	0.000059	0.000058	0.000058	0.000058
Vanadium V	mg/L	0.0019	0.0019	0.0019	0.0017	0.0018	0.0015	0.0014	0.0015	0.0014	0.0014	0.0014	0.0014
Zinc Zn	mg/L	0.0072	0.0071	0.0071	0.0052	0.0050	0.0043	0.0042	0.0044	0.0043	0.0043	0.0043	0.0042
Zirconium Zr	mg/L	0.0034	0.0034	0.0033	0.0034	0.0037	0.0033	0.0032	0.0033	0.0033	0.0032	0.0032	0.0032

Table H-1-A-2
Scenario 4

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter													
TDS	mg/L	239	238	237	180	129	139	139	129	130	130	129	128
TSS	mg/L	2.7	2.7	2.7	2.8	2.3	2.5	2.6	2.5	2.5	2.5	2.5	2.5
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.010	0.010	0.010	0.007	0.004	0.005	0.004	0.004	0.004	0.004	0.004	0.004
Sulphate	mg/L	11.9	11.8	11.8	8.2	5.6	6.0	5.9	5.4	5.5	5.5	5.5	5.4
Chloride	mg/L	168	167	166	127	91	98	99	91	93	92	92	91
Total Ammonia	mg/L	0.004	0.004	0.004		0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000
Nitrate	mg/L	0.49	0.38	0.27	0.18	0.12	0.13	0.12	0.11	0.01			
Nitrite	mg/L	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alkalinity	mg/L	19	19	19	18	14	16	16	15	15	15	15	15
OrthoPhosphate-P	mg/L	0.0265	0.0264	0.0262	0.0178	0.0119	0.0126	0.0123	0.0113	0.0114	0.0114	0.0113	0.0113
Phosphate-P	mg/L	0.0351	0.0350	0.0348	0.0275	0.0196	0.0211	0.0210	0.0194	0.0197	0.0196	0.0195	0.0194
Org. Carbon	mg/L	3.4	3.4	3.3	3.5	2.9	3.2	3.3	3.1	3.1	3.1	3.1	3.1
Hardness CaCO3	mg/L	30	29	29	26	21	23	24	22	23	22	22	22
Total Metals													
Aluminum Al	mg/L	0.10	0.10	0.10	0.11	0.08	0.09	0.10	0.09	0.09	0.09	0.09	0.09
Antimony Sb	mg/L	0.0025	0.0025	0.0025	0.0017	0.0011	0.0012	0.0012	0.0011	0.0011	0.0011	0.0011	0.0011
Arsenic As	mg/L	0.0007	0.0007	0.0007	0.0006	0.0004	0.0005	0.0005	0.0004	0.0004	0.0004	0.0004	0.0004
Barium Ba	mg/L	0.0021	0.0021	0.0021	0.0017	0.0013	0.0015	0.0015	0.0014	0.0014	0.0014	0.0014	0.0014
Beryllium Be	mg/L	0.00019	0.00019	0.00019	0.00017	0.00013	0.00013	0.00013	0.00012	0.00012	0.00012	0.00012	0.00012
Bismuth Bi	mg/L	0.00229	0.00227	0.00226	0.00150	0.00100	0.00105	0.00102	0.00093	0.00095	0.00094	0.00094	0.00093
Boron B	mg/L	0.022	0.022	0.022	0.021	0.017	0.019	0.020	0.018	0.019	0.018	0.018	0.018
Cadmium Cd	mg/L	0.0000190	0.0000189	0.0000188	0.0000143	0.0000101	0.0000109	0.0000109	0.0000101	0.0000102	0.0000102	0.0000101	0.0000101
Calcium Ca	mg/L	35	35	35	25	17	18	18	16	17	16	16	16
Chromium Cr	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Cobalt Co	mg/L	0.0012	0.0012	0.0012	0.0008	0.0006	0.0006	0.0006	0.0005	0.0006	0.0006	0.0005	0.0005
Copper Cu	mg/L	0.0017	0.0017	0.0017	0.0014	0.0011	0.0012	0.0012	0.0011	0.0011	0.0011	0.0011	0.0011
Iron Fe	mg/L	0.11	0.11	0.11	0.11	0.09	0.10	0.11	0.10	0.10	0.10	0.10	0.10
Lead Pb	mg/L	0.00013	0.00012	0.00012	0.00010	0.00007	0.00008	0.00008	0.00007	0.00007	0.00007	0.00007	0.00007
Lithium Li	mg/L	0.0030	0.0030	0.0030	0.0030	0.0024	0.0027	0.0028	0.0026	0.0026	0.0026	0.0026	0.0026
Magnesium Mg	mg/L	4.4	4.3	4.3	4.2	3.3	3.7	3.9	3.6	3.7	3.6	3.6	3.6
Manganese Mn	mg/L	0.006	0.006	0.006	0.005	0.003	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Mercury Hg	mg/L	0.0000081	0.0000081	0.0000080	0.0000082	0.0000065	0.0000073	0.0000076	0.0000071	0.0000072	0.0000071	0.0000071	0.0000071
Molybdenum Mo	mg/L	0.00108	0.00107	0.00107	0.00077	0.00054	0.00057	0.00056	0.00052	0.00053	0.00053	0.00052	0.00052
Nickel Ni	mg/L	0.0013	0.0013	0.0013	0.0010	0.0007	0.0008	0.0008	0.0007	0.0007	0.0007	0.0007	0.0007
Phosphorus P	mg/L	0.045	0.045	0.044	0.031	0.021	0.022	0.022	0.020	0.020	0.020	0.020	0.020
Potassium K	mg/L	5.9	5.9	5.8	4.6	3.3	3.6	3.6	3.3	3.4	3.4	3.3	3.3
Selenium Se	mg/L	0.00060	0.00060	0.00060	0.00062	0.00050	0.00055	0.00057	0.00053	0.00054	0.00054	0.00054	0.00053
Silicon SiO2	mg/L	1.14	1.14	1.13	1.03	0.78	0.86	0.89	0.83	0.84	0.83	0.83	0.82
Silver Ag	mg/L	0.0000656	0.0000652	0.0000649	0.0000657	0.0000521	0.0000550	0.0000536	0.0000493	0.0000501	0.0000497	0.0000495	0.0000493
Sodium Na	mg/L	61	60	60	49	37	40	41	38	38	38	38	38
Strontium Sr	mg/L	0.027	0.027	0.027	0.025	0.019	0.021	0.022	0.021	0.021	0.021	0.021	0.021
Tellurium Te	mg/L	0.028	0.028	0.027	0.029	0.023	0.026	0.027	0.025	0.026	0.025	0.025	0.025
Thallium Tl	mg/L	0.000024	0.000023	0.000023	0.000022	0.000017	0.000019	0.000020	0.000018	0.000019	0.000018	0.000018	0.000018
Thorium Th	mg/L	0.000044	0.000043	0.000043	0.000039	0.000029	0.000032	0.000033	0.000031	0.000031	0.000031	0.000031	0.000031
Tin Sn	mg/L	0.00050	0.00049	0.00049	0.00035	0.00026	0.00028	0.00029	0.00027	0.00027	0.00027	0.00027	0.00026
Titanium Ti	mg/L	0.0081	0.0080	0.0080	0.0085	0.0069	0.0077	0.0080	0.0075	0.0076	0.0076	0.0075	0.0075
Uranium U	mg/L	0.000058	0.000057	0.000057	0.000055	0.000043	0.000046	0.000046	0.000043	0.000043	0.000043	0.000043	0.000043
Vanadium V	mg/L	0.0014	0.0014	0.0014	0.0013	0.0010	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011
Zinc Zn	mg/L	0.0042	0.0042	0.0042	0.0031	0.0022	0.0024	0.0027	0.0026	0.0026	0.0026	0.0026	0.0026
Zirconium Zr	mg/L	0.0032	0.0032	0.0032	0.0032	0.0025	0.0028	0.0029	0.0027	0.0027	0.0027	0.0027	0.0027

Table H-1-A-2
Scenario 4

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter													
TDS	mg/L	128	127	127	108	112	98	91	95	92	92	91	91
TSS	mg/L	2.4	2.4	2.4	2.6	2.9	2.6	2.5	2.6	2.6	2.5	2.5	2.5
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.004	0.004	0.004	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Sulphate	mg/L	5.4	5.4	5.4	4.0	4.0	3.4	3.1	3.2	3.2	3.1	3.1	3.1
Chloride	mg/L	91	90	90	77	80	71	66	68	67	66	66	66
Total Ammonia	mg/L	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000
Nitrate	mg/L				0.00	0.00	0.00	0.00	0.00				
Nitrite	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alkalinity	mg/L	15	15	15	15	17	15	15	15	15	15	15	15
OrthoPhosphate-P	mg/L	0.0112	0.0112	0.0111	0.0079	0.0075	0.0064	0.0057	0.0059	0.0057	0.0057	0.0057	0.0056
Phosphate-P	mg/L	0.0193	0.0192	0.0191	0.0172	0.0177	0.0154	0.0142	0.0148	0.0144	0.0143	0.0142	0.0142
Org. Carbon	mg/L	3.1	3.1	3.0	3.3	3.8	3.4	3.2	3.3	3.2	3.2	3.2	3.2
Hardness CaCO3	mg/L	22	22	22	22	24	22	21	22	21	21	21	21
Total Metals													
Aluminum Al	mg/L	0.09	0.09	0.09	0.10	0.11	0.10	0.09	0.10	0.10	0.10	0.09	0.09
Antimony Sb	mg/L	0.0011	0.0011	0.0011	0.0008	0.0007	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006
Arsenic As	mg/L	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0003	0.0004	0.0003	0.0003	0.0003	0.0003
Barium Ba	mg/L	0.0014	0.0014	0.0014	0.0013	0.0014	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012
Beryllium Be	mg/L	0.00012	0.00012	0.00012	0.00012	0.00013	0.00011	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010
Bismuth Bi	mg/L	0.00093	0.00092	0.00092	0.00063	0.00058	0.00049	0.00044	0.00045	0.00044	0.00043	0.00043	0.00043
Boron B	mg/L	0.018	0.018	0.018	0.019	0.021	0.019	0.018	0.019	0.018	0.018	0.018	0.018
Cadmium Cd	mg/L	0.0000100	0.0000100	0.0000099	0.0000084	0.0000087	0.0000076	0.0000070	0.0000073	0.0000071	0.0000071	0.0000070	0.0000070
Calcium Ca	mg/L	16	16	16	12	12	10	10	10	10	10	10	9
Chromium Cr	mg/L	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Cobalt Co	mg/L	0.0005	0.0005	0.0005	0.0004	0.0004	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003
Copper Cu	mg/L	0.0011	0.0011	0.0011	0.0010	0.0011	0.0010	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009
Iron Fe	mg/L	0.10	0.10	0.10	0.11	0.12	0.11	0.10	0.11	0.11	0.11	0.11	0.11
Lead Pb	mg/L	0.00007	0.00007	0.00007	0.00006	0.00007	0.00006	0.00005	0.00006	0.00006	0.00005	0.00005	0.00005
Lithium Li	mg/L	0.0026	0.0026	0.0025	0.0027	0.0030	0.0027	0.0026	0.0027	0.0026	0.0026	0.0026	0.0026
Magnesium Mg	mg/L	3.6	3.6	3.6	3.7	4.1	3.7	3.5	3.7	3.6	3.6	3.6	3.5
Manganese Mn	mg/L	0.004	0.004	0.004	0.003	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Mercury Hg	mg/L	0.0000070	0.0000070	0.0000070	0.0000075	0.0000083	0.0000075	0.0000071	0.0000074	0.0000073	0.0000072	0.0000072	0.0000071
Molybdenum Mo	mg/L	0.00052	0.00052	0.00051	0.00041	0.00041	0.00036	0.00032	0.00034	0.00033	0.00033	0.00032	0.00032
Nickel Ni	mg/L	0.0007	0.0007	0.0007	0.0006	0.0006	0.0006	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Phosphorus P	mg/L	0.020	0.020	0.020	0.015	0.014	0.012	0.011	0.011	0.011	0.011	0.011	0.011
Potassium K	mg/L	3.3	3.3	3.3	2.9	3.0	2.6	2.5	2.6	2.5	2.5	2.5	2.5
Selenium Se	mg/L	0.00053	0.00053	0.00053	0.00057	0.00064	0.00057	0.00054	0.00057	0.00055	0.00055	0.00055	0.00054
Silicon SiO2	mg/L	0.82	0.82	0.81	0.81	0.89	0.79	0.74	0.78	0.76	0.76	0.75	0.75
Silver Ag	mg/L	0.0000491	0.0000488	0.0000486	0.0000544	0.0000615	0.0000521	0.0000463	0.0000477	0.0000466	0.0000463	0.0000460	0.0000458
Sodium Na	mg/L	38	37	37	34	37	33	31	32	31	31	31	31
Strontium Sr	mg/L	0.021	0.021	0.021	0.020	0.023	0.020	0.020	0.021	0.020	0.020	0.020	0.020
Tellurium Te	mg/L	0.025	0.025	0.025	0.027	0.030	0.027	0.026	0.027	0.026	0.026	0.026	0.026
Thallium Tl	mg/L	0.000018	0.000018	0.000018	0.000019	0.000020	0.000018	0.000017	0.000018	0.000018	0.000018	0.000017	0.000017
Thorium Th	mg/L	0.000031	0.000030	0.000030	0.000030	0.000033	0.000029	0.000027	0.000029	0.000028	0.000028	0.000028	0.000027
Tin Sn	mg/L	0.00026	0.00026	0.00026	0.00020	0.00022	0.00020	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019
Titanium Ti	mg/L	0.0075	0.0074	0.0074	0.0081	0.0091	0.0081	0.0077	0.0081	0.0079	0.0079	0.0078	0.0078
Uranium U	mg/L	0.000042	0.000042	0.000042	0.000045	0.000050	0.000043	0.000039	0.000041	0.000040	0.000040	0.000039	0.000039
Vanadium V	mg/L	0.0010	0.0010	0.0010	0.0011	0.0012	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
Zinc Zn	mg/L	0.0025	0.0025	0.0025	0.0021	0.0021	0.0018	0.0020	0.0021	0.0021	0.0021	0.0021	0.0020
Zirconium Zr	mg/L	0.0027	0.0027	0.0027	0.0028	0.0031	0.0028	0.0027	0.0028	0.0027	0.0027	0.0027	0.0027

Table H-1-A-2
Scenario 4

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter													
TDS	mg/L	91	90	90	83	64	71	73	68	69	69	69	68
TSS	mg/L	2.5	2.5	2.5	2.7	2.2	2.4	2.5	2.4	2.4	2.4	2.4	2.4
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Sulphate	mg/L	3.1	3.1	3.1	2.5	1.8	2.0	2.0	1.9	1.9	1.9	1.9	1.9
Chloride	mg/L	65	65	65	60	47	52	54	50	51	51	50	50
Total Ammonia	mg/L	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
Nitrate	mg/L				0.00	0.00	0.00	0.00	0.00				
Nitrite	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alkalinity	mg/L	15	15	14	15	12	14	14	13	14	14	13	13
OrthoPhosphate-P	mg/L	0.0056	0.0056	0.0056	0.0041	0.0029	0.0031	0.0031	0.0028	0.0029	0.0029	0.0028	0.0028
Phosphate-P	mg/L	0.0141	0.0140	0.0140	0.0137	0.0105	0.0115	0.0118	0.0109	0.0111	0.0110	0.0110	0.0109
Org. Carbon	mg/L	3.2	3.1	3.1	3.3	2.8	3.1	3.2	3.0	3.0	3.0	3.0	3.0
Hardness CaCO3	mg/L	21	21	21	21	17	19	20	19	19	19	19	19
Total Metals													
Aluminum Al	mg/L	0.09	0.09	0.09	0.10	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Antimony Sb	mg/L	0.0006	0.0006	0.0006	0.0004	0.0003	0.0003	0.0004	0.0003	0.0003	0.0003	0.0003	0.0003
Arsenic As	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003
Barium Ba	mg/L	0.0012	0.0012	0.0012	0.0011	0.0009	0.0010	0.0011	0.0010	0.0010	0.0010	0.0010	0.0010
Beryllium Be	mg/L	0.00010	0.00010	0.00010	0.00011	0.00009	0.00009	0.00009	0.00008	0.00008	0.00008	0.00008	0.00008
Bismuth Bi	mg/L	0.00043	0.00043	0.00042	0.00029	0.00019	0.00020	0.00020	0.00018	0.00019	0.00018	0.00018	0.00018
Boron B	mg/L	0.018	0.018	0.018	0.019	0.015	0.017	0.018	0.017	0.017	0.017	0.017	0.017
Cadmium Cd	mg/L	0.0000070	0.0000069	0.0000069	0.0000064	0.0000049	0.0000054	0.0000056	0.0000052	0.0000053	0.0000052	0.0000052	0.0000052
Calcium Ca	mg/L	9	9	9	8	6	6	6	6	6	6	6	6
Chromium Cr	mg/L	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cobalt Co	mg/L	0.0003	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Copper Cu	mg/L	0.0009	0.0009	0.0009	0.0009	0.0007	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0007
Iron Fe	mg/L	0.10	0.10	0.10	0.11	0.09	0.10	0.11	0.10	0.10	0.10	0.10	0.10
Lead Pb	mg/L	0.00005	0.00005	0.00005	0.00005	0.00004	0.00005	0.00005	0.00004	0.00004	0.00004	0.00004	0.00004
Lithium Li	mg/L	0.0026	0.0026	0.0025	0.0027	0.0022	0.0025	0.0026	0.0024	0.0024	0.0024	0.0024	0.0024
Magnesium Mg	mg/L	3.5	3.5	3.5	3.6	3.0	3.3	3.5	3.3	3.3	3.3	3.3	3.3
Manganese Mn	mg/L	0.003	0.003	0.003	0.003	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Mercury Hg	mg/L	0.0000071	0.0000071	0.0000070	0.0000076	0.0000061	0.0000068	0.0000071	0.0000067	0.0000068	0.0000067	0.0000067	0.0000067
Molybdenum Mo	mg/L	0.00032	0.00032	0.00032	0.00028	0.00021	0.00023	0.00023	0.00022	0.00022	0.00022	0.00022	0.00022
Nickel Ni	mg/L	0.0005	0.0005	0.0005	0.0005	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
Phosphorus P	mg/L	0.011	0.011	0.011	0.009	0.006	0.007	0.007	0.006	0.006	0.006	0.006	0.006
Potassium K	mg/L	2.5	2.4	2.4	2.3	1.8	2.0	2.1	1.9	2.0	1.9	1.9	1.9
Selenium Se	mg/L	0.00054	0.00054	0.00054	0.00058	0.00047	0.00052	0.00054	0.00051	0.00052	0.00051	0.00051	0.00051
Silicon SiO2	mg/L	0.75	0.74	0.74	0.76	0.61	0.68	0.71	0.66	0.67	0.67	0.67	0.66
Silver Ag	mg/L	0.0000457	0.0000454	0.0000452	0.0000526	0.0000435	0.0000460	0.0000449	0.0000413	0.0000419	0.0000416	0.0000414	0.0000413
Sodium Na	mg/L	31	30	30	30	24	26	27	26	26	26	26	26
Strontium Sr	mg/L	0.020	0.020	0.019	0.020	0.016	0.018	0.019	0.018	0.018	0.018	0.018	0.018
Tellurium Te	mg/L	0.026	0.026	0.026	0.028	0.022	0.025	0.026	0.024	0.025	0.025	0.025	0.024
Thallium Tl	mg/L	0.000017	0.000017	0.000017	0.000018	0.000014	0.000016	0.000017	0.000016	0.000016	0.000016	0.000016	0.000016
Thorium Th	mg/L	0.000027	0.000027	0.000027	0.000028	0.000022	0.000025	0.000026	0.000024	0.000025	0.000024	0.000024	0.000024
Tin Sn	mg/L	0.00019	0.00019	0.00018	0.00015	0.00012	0.00014	0.00015	0.00014	0.00014	0.00014	0.00014	0.00014
Titanium Ti	mg/L	0.0078	0.0077	0.0077	0.0083	0.0067	0.0075	0.0079	0.0074	0.0075	0.0075	0.0074	0.0074
Uranium U	mg/L	0.000039	0.000039	0.000039	0.000043	0.000035	0.000038	0.000038	0.000035	0.000036	0.000035	0.000035	0.000035
Vanadium V	mg/L	0.0010	0.0010	0.0010	0.0010	0.0008	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009
Zinc Zn	mg/L	0.0020	0.0020	0.0020	0.0017	0.0013	0.0014	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017
Zirconium Zr	mg/L	0.0027	0.0027	0.0027	0.0028	0.0023	0.0026	0.0027	0.0025	0.0025	0.0025	0.0025	0.0025

Table H-1-A-2
Scenario 4

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE										
Date		Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16
Parameter												
TDS	mg/L	68	68	67	68	75	67	63	67	65	65	64
TSS	mg/L	2.4	2.4	2.3	2.6	2.9	2.6	2.5	2.6	2.5	2.5	2.5
Free CN	mg/L											
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L											
CNO	mg/L											
SCN	mg/L	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sulphate	mg/L	1.9	1.9	1.9	1.7	1.8	1.6	1.5	1.6	1.5	1.5	1.5
Chloride	mg/L	50	50	49	50	55	49	47	49	48	48	47
Total Ammonia	mg/L	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.000	0.000	0.000	0.000
Nitrate	mg/L				0.00	0.00	0.00	0.00	0.00			
Nitrite	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alkalinity	mg/L	13	13	13	14	16	15	14	14	14	14	14
OrthoPhosphate-P	mg/L	0.0028	0.0028	0.0028	0.0023	0.0023	0.0020	0.0019	0.0019	0.0019	0.0019	0.0019
Phosphate-P	mg/L	0.0109	0.0108	0.0108	0.0116	0.0125	0.0111	0.0103	0.0108	0.0105	0.0105	0.0104
Org. Carbon	mg/L	3.0	3.0	2.9	3.2	3.7	3.3	3.1	3.3	3.2	3.2	3.1
Hardness CaCO3	mg/L	19	19	18	19	22	20	19	20	20	19	19
Total Metals												
Aluminum Al	mg/L	0.09	0.09	0.09	0.10	0.11	0.10	0.09	0.10	0.09	0.09	0.09
Antimony Sb	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.0002	0.0002	0.0003	0.0003	0.0003	0.0003
Arsenic As	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003
Barium Ba	mg/L	0.0010	0.0010	0.0010	0.0010	0.0011	0.0011	0.0010	0.0011	0.0010	0.0010	0.0010
Beryllium Be	mg/L	0.00008	0.00008	0.00008	0.00009	0.00011	0.00009	0.00008	0.00008	0.00008	0.00008	0.00008
Bismuth Bi	mg/L	0.00018	0.00018	0.00018	0.00013	0.00012	0.00011	0.00009	0.00010	0.00009	0.00009	0.00009
Boron B	mg/L	0.017	0.017	0.016	0.018	0.020	0.018	0.017	0.018	0.018	0.017	0.017
Cadmium Cd	mg/L	0.0000052	0.0000052	0.0000051	0.0000052	0.0000057	0.0000051	0.0000048	0.0000050	0.0000049	0.0000049	0.0000048
Calcium Ca	mg/L	6	6	6	5	6	5	5	5	5	5	5
Chromium Cr	mg/L	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
Cobalt Co	mg/L	0.0002	0.0002	0.0002	0.0001	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Copper Cu	mg/L	0.0007	0.0007	0.0007	0.0008	0.0009	0.0008	0.0007	0.0008	0.0008	0.0008	0.0007
Iron Fe	mg/L	0.10	0.10	0.10	0.11	0.12	0.11	0.10	0.11	0.11	0.11	0.10
Lead Pb	mg/L	0.00004	0.00004	0.00004	0.00005	0.00005	0.00005	0.00004	0.00004	0.00004	0.00004	0.00004
Lithium Li	mg/L	0.0024	0.0024	0.0024	0.0026	0.0029	0.0026	0.0025	0.0026	0.0025	0.0025	0.0025
Magnesium Mg	mg/L	3.2	3.2	3.2	3.4	3.9	3.5	3.4	3.5	3.4	3.4	3.4
Manganese Mn	mg/L	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Mercury Hg	mg/L	0.0000067	0.0000066	0.0000066	0.0000072	0.0000081	0.0000072	0.0000069	0.0000073	0.0000071	0.0000070	0.0000070
Molybdenum Mo	mg/L	0.00021	0.00021	0.00021	0.00021	0.00022	0.00020	0.00018	0.00019	0.00019	0.00019	0.00019
Nickel Ni	mg/L	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
Phosphorus P	mg/L	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005
Potassium K	mg/L	1.9	1.9	1.9	1.9	2.2	1.9	1.8	1.9	1.9	1.9	1.9
Selenium Se	mg/L	0.00051	0.00050	0.00050	0.00055	0.00062	0.00056	0.00053	0.00055	0.00054	0.00054	0.00053
Silicon SiO2	mg/L	0.66	0.66	0.65	0.71	0.79	0.71	0.67	0.70	0.69	0.68	0.68
Silver Ag	mg/L	0.0000411	0.0000409	0.0000407	0.0000491	0.0000566	0.0000480	0.0000427	0.0000440	0.0000429	0.0000426	0.0000424
Sodium Na	mg/L	25	25	25	26	29	26	25	26	26	26	25
Strontium Sr	mg/L	0.018	0.018	0.018	0.018	0.021	0.019	0.018	0.019	0.019	0.018	0.018
Tellurium Te	mg/L	0.024	0.024	0.024	0.026	0.030	0.027	0.025	0.027	0.026	0.026	0.026
Thallium Tl	mg/L	0.000016	0.000016	0.000016	0.000017	0.000019	0.000017	0.000016	0.000017	0.000016	0.000016	0.000016
Thorium Th	mg/L	0.000024	0.000024	0.000024	0.000026	0.000029	0.000026	0.000024	0.000026	0.000025	0.000025	0.000025
Tin Sn	mg/L	0.00014	0.00014	0.00014	0.00012	0.00014	0.00013	0.00013	0.00014	0.00013	0.00013	0.00013
Titanium Ti	mg/L	0.0074	0.0073	0.0073	0.0080	0.0090	0.0081	0.0077	0.0081	0.0079	0.0078	0.0078
Uranium U	mg/L	0.000035	0.000035	0.000035	0.000040	0.000045	0.000039	0.000036	0.000037	0.000036	0.000036	0.000036
Vanadium V	mg/L	0.0009	0.0009	0.0009	0.0010	0.0011	0.0010	0.0009	0.0009	0.0009	0.0009	0.0009
Zinc Zn	mg/L	0.0017	0.0017	0.0017	0.0015	0.0015	0.0014	0.0016	0.0017	0.0017	0.0017	0.0017
Zirconium Zr	mg/L	0.0025	0.0025	0.0025	0.0027	0.0030	0.0027	0.0026	0.0027	0.0026	0.0026	0.0026

Table H 4-A-3
Scenario 4

Loadings to Tail Lake (kg/month)												
Date	Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter												
TDS	81148	78530	81148	117442	100848	86227	86140	83147	78530	81148	81148	73295
TSS	183	177	183	1239	676	336	368	233	177	183	183	166
Free CN	1.10	1.06	1.10	1.06	1.10	1.10	1.06	1.10	1.06	1.10	1.10	0.99
Total CN	11	10	11	11	11	11	10	11	10	11	11	10
WAD CN	1.47	1.42	1.47	1.42	1.47	1.47	1.42	1.47	1.42	1.47	1.47	1.32
CNO	1210	1171	1210	1171	1210	1210	1171	1210	1171	1210	1210	1093
SCN	16	16	16	16	16	16	16	16	16	16	16	15
Sulphate	14302	13840	14302	18322	17066	15395	15291	14792	13840	14302	14302	12918
Chloride	49110	47526	49110	82360	70919	57259	58093	52595	47526	49110	49110	44357
Total Ammonia	149	145	149	288	238	187	194	166	145	149	149	135
Nitrate	758	733	758	1855	1453	1051	1108	888	733	758	758	684
Nitrite	116	112	116	139	132	123	121	119	112	116	116	105
Alkalinity	6928	6704	6928	15548	12017	8299	8290	7344	6704	6928	6928	6257
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	24	22	22	21	21	21	21	21	19
Org. Carbon				2122.46	1149.16	304.79	317.09	83.28				
Hardness CaCO3	14992	14508	14992	26182	22051	16871	16918	15625	14508	14992	14992	13541
Total Metals												
Aluminum Al	4.47	4.33	4.47	19.31	12.05	9.18	8.79	5.91	4.33	4.47	4.47	4.04
Antimony Sb	1.32	1.28	1.32	4.67	3.44	2.22	2.44	1.72	1.28	1.32	1.32	1.19
Arsenic As	0.39	0.38	0.39	0.69	0.59	0.47	0.47	0.43	0.38	0.39	0.39	0.36
Barium Ba	1.56	1.51	1.56	2.29	2.00	1.75	1.72	1.62	1.51	1.56	1.56	1.41
Beryllium Be	0.05	0.05	0.05	0.23	0.15	0.08	0.09	0.06	0.05	0.05	0.05	0.04
Bismuth Bi	1.23	1.19	1.23	4.55	3.31	2.10	2.31	1.62	1.19	1.23	1.23	1.11
Boron B	2.80	2.71	2.80	10.30	7.34	4.48	4.70	3.42	2.71	2.80	2.80	2.53
Cadmium Cd	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Calcium Ca	40484	39178	40484	42156	42150	41148	39979	40728	39178	40484	40484	36566
Chromium Cr	1.02	0.99	1.02	1.32	1.26	1.11	1.06	1.04	0.99	1.02	1.02	0.92
Cobalt Co	1.67	1.62	1.67	1.85	1.81	1.73	1.69	1.70	1.62	1.67	1.67	1.51
Copper Cu	1.46	1.41	1.46	1.84	1.69	1.52	1.49	1.48	1.41	1.46	1.46	1.32
Iron Fe	4.63	4.48	4.63	21.53	11.57	9.20	9.28	5.96	4.48	4.63	4.63	4.18
Lead Pb	0.05	0.05	0.05	0.13	0.10	0.07	0.07	0.06	0.05	0.05	0.05	0.04
Lithium Li	0.46	0.45	0.46	1.84	1.14	0.69	0.73	0.54	0.45	0.46	0.46	0.42
Magnesium Mg	1082	1047	1082	2866	2073	1453	1457	1200	1047	1082	1082	977
Manganese Mn	4.56	4.41	4.56	5.17	4.97	4.80	4.75	4.66	4.41	4.56	4.56	4.12
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	1.48	1.43	1.48	1.50	1.52	1.49	1.45	1.48	1.43	1.48	1.48	1.34
Nickel Ni	1.26	1.22	1.26	1.77	1.58	1.38	1.37	1.31	1.22	1.26	1.26	1.14
Phosphorus P	33	32	33	45	40	36	36	35	32	33	33	30
Potassium K	6696	6480	6696	7119	7030	6791	6626	6737	6480	6696	6696	6048
Selenium Se	0.04	0.04	0.04	0.21	0.12	0.06	0.07	0.05	0.04	0.04	0.04	0.03
Silicon SiO2	556	538	556	963	770	630	631	583	538	556	556	502
Silver Ag	0.01	0.01	0.01	0.06	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sodium Na	6353	6148	6353	11746	9467	7284	7317	6662	6148	6353	6353	5739
Strontium Sr	12	12	12	21	18	14	14	13	12	12	12	11
Tellurium Te	0.02	0.02	0.02	17.74	8.25	2.57	3.20	0.86	0.02	0.02	0.02	0.02
Thallium Tl	0.00	0.00	0.00	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.02	0.01	0.00	0.01	0.00				
Tin Sn	0.18	0.18	0.18	0.74	0.56	0.34	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.10	0.09	0.10	2.42	1.21	0.45	0.54	0.22	0.09	0.10	0.10	0.09
Uranium U	0.00	0.00	0.00	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.36	0.35	0.36	1.09	0.79	0.52	0.54	0.43	0.35	0.36	0.36	0.33
Zinc Zn	3.5	3.4	3.5	4.4	4.1	3.8	4.2	3.7	3.4	3.5	3.5	3.2
Zirconium Zr				2.10	1.03	0.34	0.43	0.12				

Table H 4-A-3
Scenario 4

Loadings to Tail Lake (kg/month)												
Date	Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter												
TDS	81148	78530	81148	115712	100396	86172	86096	83148	78530	81148	81148	73295
TSS	183	177	183	1191	664	334	367	233	177	183	183	166
Free CN	1.10	1.06	1.10	1.06	1.10	1.10	1.06	1.10	1.06	1.10	1.10	0.99
Total CN	11	10	11	11	11	11	10	11	10	11	11	10
WAD CN	1.47	1.42	1.47	1.42	1.47	1.47	1.42	1.47	1.42	1.47	1.47	1.32
CNO	1210	1171	1210	1171	1210	1210	1171	1210	1171	1210	1210	1093
SCN	16	16	16	16	16	16	16	16	16	16	16	15
Sulphate	14302	13840	14302	18291	17057	15394	15290	14792	13840	14302	14302	12918
Chloride	49110	47526	49110	81904	70768	57240	58079	52595	47526	49110	49110	44357
Total Ammonia	149	145	149	288	238	187	194	166	145	149	149	135
Nitrate	758	733	758	1855	1453	1051	1108	888	733	758	758	684
Nitrite	116	112	116	139	132	123	121	119	112	116	116	105
Alkalinity	6928	6704	6928	15155	11900	8284	8280	7345	6704	6928	6928	6257
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	24	22	22	21	21	21	21	21	19
Org. Carbon				2028.11	1122.84	301.45	315.23	83.36				
Hardness CaCO3	14992	14508	14992	25663	21889	16851	16904	15625	14508	14992	14992	13541
Total Metals												
Aluminum Al	4.47	4.33	4.47	19.05	12.00	9.16	8.78	5.91	4.33	4.47	4.47	4.04
Antimony Sb	1.32	1.28	1.32	4.67	3.44	2.22	2.44	1.72	1.28	1.32	1.32	1.19
Arsenic As	0.39	0.38	0.39	0.69	0.59	0.47	0.47	0.43	0.38	0.39	0.39	0.36
Barium Ba	1.56	1.51	1.56	2.26	1.99	1.75	1.72	1.62	1.51	1.56	1.56	1.41
Beryllium Be	0.05	0.05	0.05	0.23	0.15	0.08	0.09	0.06	0.05	0.05	0.05	0.04
Bismuth Bi	1.23	1.19	1.23	4.55	3.31	2.10	2.31	1.62	1.19	1.23	1.23	1.11
Boron B	2.80	2.71	2.80	10.12	7.29	4.47	4.70	3.42	2.71	2.80	2.80	2.53
Cadmium Cd	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Calcium Ca	40484	39178	40484	42075	42128	41144	39977	40728	39178	40484	40484	36566
Chromium Cr	1.02	0.99	1.02	1.31	1.26	1.11	1.06	1.04	0.99	1.02	1.02	0.92
Cobalt Co	1.67	1.62	1.67	1.85	1.81	1.73	1.69	1.70	1.62	1.67	1.67	1.51
Copper Cu	1.46	1.41	1.46	1.83	1.69	1.52	1.49	1.48	1.41	1.46	1.46	1.32
Iron Fe	4.63	4.48	4.63	20.87	11.44	9.15	9.26	5.96	4.48	4.63	4.63	4.18
Lead Pb	0.05	0.05	0.05	0.13	0.10	0.07	0.07	0.06	0.05	0.05	0.05	0.04
Lithium Li	0.46	0.45	0.46	1.79	1.13	0.68	0.73	0.54	0.45	0.46	0.46	0.42
Magnesium Mg	1082	1047	1082	2802	2056	1450	1456	1200	1047	1082	1082	977
Manganese Mn	4.56	4.41	4.56	5.16	4.97	4.80	4.74	4.66	4.41	4.56	4.56	4.12
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	1.48	1.43	1.48	1.50	1.52	1.49	1.45	1.48	1.43	1.48	1.48	1.34
Nickel Ni	1.26	1.22	1.26	1.76	1.57	1.38	1.37	1.31	1.22	1.26	1.26	1.14
Phosphorus P	33	32	33	45	40	36	36	35	32	33	33	30
Potassium K	6696	6480	6696	7094	7024	6791	6625	6737	6480	6696	6696	6048
Selenium Se	0.04	0.04	0.04	0.20	0.12	0.06	0.07	0.05	0.04	0.04	0.04	0.03
Silicon SiO2	556	538	556	949	767	629	630	583	538	556	556	502
Silver Ag	0.01	0.01	0.01	0.06	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sodium Na	6353	6148	6353	11499	9396	7274	7310	6662	6148	6353	6353	5739
Strontium Sr	12	12	12	20	17	14	14	13	12	12	12	11
Tellurium Te	0.02	0.02	0.02	16.95	8.06	2.54	3.18	0.86	0.02	0.02	0.02	0.02
Thallium Tl	0.00	0.00	0.00	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.02	0.01	0.00	0.01	0.00				
Tin Sn	0.18	0.18	0.18	0.74	0.56	0.34	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.10	0.09	0.10	2.32	1.18	0.45	0.54	0.22	0.09	0.10	0.10	0.09
Uranium U	0.00	0.00	0.00	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.36	0.35	0.36	1.08	0.79	0.52	0.54	0.43	0.35	0.36	0.36	0.33
Zinc Zn	3.5	3.4	3.5	4.4	4.1	3.8	4.2	3.7	3.4	3.5	3.5	3.2
Zirconium Zr				2.02	1.01	0.34	0.43	0.12				

Table H 4-A-3
Scenario 4

Loadings to Tail Lake (kg/month)												
Date	Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter												
TDS	50662	49028	50662	464691	448284	433948	434888	430899	49028	50662	50662	45759
TSS				1656	787	247	310	82				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate	1289	1247	1289	5602	3985	2356	2665	1768	1247	1289	1289	1164
Chloride	49110	47526	49110	329561	309382	290212	291716	283847	47526	49110	49110	44357
Total Ammonia	25	24	25	153	104	58	68	40	24	25	25	22
Nitrate	29	28	29	1036	654	292	365	147	28	29	29	26
Nitrite	64	62	64	86	79	71	70	67	62	64	64	58
Alkalinity				8512	5014	1370	1593	422				
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	28	24	22	22	22	21	21	21	19
Org. Carbon				2042.79	1132.23	304.40	318.67	84.36				
Hardness CaCO3				11235	6955	1877	2422	641				
Total Metals												
Aluminum Al	0.81	0.78	0.81	67.59	32.65	12.94	14.56	4.63	0.78	0.81	0.81	0.73
Antimony Sb	1.21	1.17	1.21	4.57	3.33	2.11	2.33	1.61	1.17	1.21	1.21	1.09
Arsenic As	0.03	0.03	0.03	0.36	0.22	0.10	0.11	0.06	0.03	0.03	0.03	0.02
Barium Ba	0.06	0.06	0.06	0.80	0.48	0.25	0.27	0.12	0.06	0.06	0.06	0.05
Beryllium Be	0.03	0.03	0.03	0.20	0.13	0.06	0.06	0.04	0.03	0.03	0.03	0.03
Bismuth Bi	1.21	1.17	1.21	4.52	3.28	2.08	2.29	1.60	1.17	1.21	1.21	1.09
Boron B	0.60	0.58	0.60	14.19	7.94	3.12	3.63	1.49	0.58	0.60	0.60	0.55
Cadmium Cd	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Calcium Ca	263	254	263	25787	24330	23233	23372	22788	254	263	263	237
Chromium Cr	0.07	0.06	0.07	0.48	0.35	0.17	0.15	0.09	0.06	0.07	0.07	0.06
Cobalt Co	0.06	0.06	0.06	0.31	0.20	0.12	0.13	0.08	0.06	0.06	0.06	0.05
Copper Cu	0.03	0.03	0.03	0.60	0.33	0.12	0.14	0.06	0.03	0.03	0.03	0.03
Iron Fe	0.23	0.23	0.23	69.49	32.06	12.58	14.82	4.14	0.23	0.23	0.23	0.21
Lead Pb	0.01	0.01	0.01	0.09	0.06	0.03	0.03	0.02	0.01	0.01	0.01	0.01
Lithium Li	0.06	0.06	0.06	1.90	0.96	0.36	0.43	0.16	0.06	0.06	0.06	0.05
Magnesium Mg	121	117	121	2595	1438	596	660	275	117	121	121	110
Manganese Mn	0.16	0.15	0.16	2.16	1.17	0.59	0.72	0.32	0.15	0.16	0.16	0.14
Mercury Hg	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	0.01	0.01	0.01	0.15	0.08	0.03	0.04	0.02	0.01	0.01	0.01	0.01
Nickel Ni	0.12	0.12	0.12	0.70	0.45	0.25	0.27	0.17	0.12	0.12	0.12	0.11
Phosphorus P	23	22	23	33	29	25	25	24	22	23	23	21
Potassium K	25	24	25	1211	624	204	276	94	24	25	25	23
Selenium Se	0.00	0.00	0.00	0.38	0.18	0.06	0.07	0.02	0.00	0.00	0.00	0.00
Silicon SiO2	10	9	10	524	265	95	117	40	9	10	10	9
Silver Ag	0.00	0.00	0.00	0.05	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Sodium Na	12	12	12	141148	133471	128007	128640	126375	12	12	12	11
Strontium Sr	0	0	0	12	7	2	3	1	0	0	0	0
Tellurium Te				17.05	8.10	2.54	3.19	0.85				
Thallium Tl	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.03	0.01	0.00	0.01	0.00				
Tin Sn	0.18	0.18	0.18	0.74	0.55	0.33	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.06	0.06	0.06	5.41	2.63	0.88	1.09	0.34	0.06	0.06	0.06	0.05
Uranium U	0.00	0.00	0.00	0.04	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.18	0.18	0.18	1.34	0.81	0.40	0.44	0.27	0.18	0.18	0.18	0.16
Zinc Zn	0.2	0.2	0.2	1.4	0.9	0.5	1.0	0.4	0.2	0.2	0.2	0.2
Zirconium Zr				1.92	0.94	0.31	0.39	0.11				

Table H 4-A-3
Scenario 4

Loadings to Tail Lake (kg/month)												
Date	Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter												
TDS				38246	19869	5209	7869	2087				
TSS				1691	805	253	319	85				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				832	512	145	240	68				
Chloride				27641	14984	4402	5738	1522				
Total Ammonia				61	37	16	22	7				
Nitrate				470	291	123	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				8692	5133	1406	1639	435				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				7	3	1	1	0				
Org. Carbon				2086.13	1159.02	312.54	327.87	86.98				
Hardness CaCO3				11474	7120	1927	2492	661				
Total Metals												
Aluminum Al				66.18	31.32	11.91	13.47	3.69				
Antimony Sb				0.08	0.06	0.04	0.05	0.01				
Arsenic As				0.26	0.15	0.05	0.06	0.02				
Barium Ba				0.59	0.33	0.15	0.16	0.04				
Beryllium Be				0.09	0.05	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				12.18	6.44	2.13	2.55	0.71				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				2585	1373	519	617	171				
Chromium Cr				0.26	0.19	0.07	0.03	0.01				
Cobalt Co				0.08	0.04	0.01	0.02	0.01				
Copper Cu				0.52	0.27	0.07	0.09	0.02				
Iron Fe				70.20	32.25	12.54	14.83	3.96				
Lead Pb				0.05	0.03	0.01	0.01	0.00				
Lithium Li				1.71	0.82	0.26	0.33	0.09				
Magnesium Mg				2189	1136	398	443	118				
Manganese Mn				1.60	0.75	0.32	0.43	0.12				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.11	0.05	0.01	0.02	0.00				
Nickel Ni				0.26	0.13	0.04	0.04	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				1141	569	165	235	63				
Selenium Se				0.39	0.19	0.06	0.07	0.02				
Silicon SiO2				497	244	80	101	28				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				15888	8080	2506	3161	839				
Strontium Sr				11	6	2	3	1				
Tellurium Te				17.41	8.29	2.61	3.29	0.87				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.03	0.01	0.01	0.01	0.00				
Tin Sn				0.06	0.07	0.02	0.03	0.01				
Titanium Ti				5.29	2.52	0.80	1.00	0.27				
Uranium U				0.04	0.02	0.00	0.01	0.00				
Vanadium V				0.68	0.33	0.09	0.10	0.03				
Zinc Zn				0.7	0.3	0.2	0.6	0.2				
Zirconium Zr				1.95	0.96	0.31	0.40	0.11				

Table H 4-A-3
Scenario 4

Loadings to Tail Lake (kg/month)												
Date	Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter												
TDS				39499	20588	5296	7936	2083				
TSS				1746	834	258	322	84				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				854	527	147	242	68				
Chloride				28546	15526	4475	5787	1519				
Total Ammonia				61	38	16	22	7				
Nitrate				470	291	123	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				8977	5319	1430	1653	434				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				8	3	1	1	0				
Org. Carbon				2154.46	1200.95	317.76	330.68	86.79				
Hardness CaCO3				11850	7377	1960	2513	660				
Total Metals												
Aluminum Al				68.21	32.36	12.09	13.58	3.69				
Antimony Sb				0.08	0.06	0.04	0.05	0.01				
Arsenic As				0.27	0.16	0.05	0.06	0.02				
Barium Ba				0.61	0.34	0.15	0.16	0.04				
Beryllium Be				0.09	0.05	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				12.54	6.65	2.17	2.57	0.70				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				2662	1417	527	621	170				
Chromium Cr				0.27	0.19	0.07	0.03	0.01				
Cobalt Co				0.08	0.04	0.01	0.02	0.01				
Copper Cu				0.53	0.28	0.07	0.09	0.02				
Iron Fe				72.47	33.39	12.74	14.96	3.95				
Lead Pb				0.05	0.03	0.01	0.01	0.00				
Lithium Li				1.76	0.85	0.26	0.33	0.09				
Magnesium Mg				2260	1176	405	447	118				
Manganese Mn				1.66	0.78	0.33	0.44	0.12				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.11	0.05	0.01	0.02	0.00				
Nickel Ni				0.27	0.13	0.04	0.04	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				1178	589	168	237	62				
Selenium Se				0.40	0.19	0.06	0.07	0.02				
Silicon SiO2				512	251	81	101	28				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				16408	8373	2548	3188	837				
Strontium Sr				12	7	2	3	1				
Tellurium Te				17.98	8.59	2.65	3.31	0.87				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.03	0.01	0.01	0.01	0.00				
Tin Sn				0.06	0.07	0.02	0.03	0.01				
Titanium Ti				5.47	2.61	0.81	1.01	0.27				
Uranium U				0.04	0.02	0.00	0.01	0.00				
Vanadium V				0.70	0.34	0.09	0.10	0.03				
Zinc Zn				0.7	0.4	0.2	0.6	0.2				
Zirconium Zr				2.01	0.99	0.32	0.40	0.11				

Table H 4-A-3
Scenario 4

Loadings to Tail Lake (kg/month)												
Date	Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter												
TDS				39413	20539	5285	7919	2102				
TSS				1742	832	257	321	85				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				853	526	147	241	68				
Chloride				28484	15489	4465	5775	1532				
Total Ammonia				61	38	16	22	7				
Nitrate				470	291	123	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				8957	5306	1427	1650	438				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				8	3	1	1	0				
Org. Carbon				2149.78	1198.09	317.07	329.98	87.57				
Hardness CaCO3				11824	7360	1955	2508	666				
Total Metals												
Aluminum Al				68.07	32.29	12.07	13.55	3.72				
Antimony Sb				0.08	0.06	0.04	0.05	0.01				
Arsenic As				0.27	0.15	0.05	0.06	0.02				
Barium Ba				0.61	0.34	0.15	0.16	0.04				
Beryllium Be				0.09	0.05	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				12.52	6.64	2.16	2.57	0.71				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				2656	1414	526	620	172				
Chromium Cr				0.27	0.19	0.07	0.03	0.01				
Cobalt Co				0.08	0.04	0.01	0.02	0.01				
Copper Cu				0.53	0.27	0.07	0.09	0.02				
Iron Fe				72.31	33.32	12.71	14.93	3.99				
Lead Pb				0.05	0.03	0.01	0.01	0.00				
Lithium Li				1.76	0.84	0.26	0.33	0.09				
Magnesium Mg				2255	1173	404	446	119				
Manganese Mn				1.65	0.78	0.33	0.44	0.12				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.11	0.05	0.01	0.02	0.01				
Nickel Ni				0.27	0.13	0.04	0.04	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				1175	588	168	237	63				
Selenium Se				0.40	0.19	0.06	0.07	0.02				
Silicon SiO2				511	251	81	101	28				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				16373	8353	2542	3182	845				
Strontium Sr				12	6	2	3	1				
Tellurium Te				17.94	8.57	2.65	3.31	0.88				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.03	0.01	0.01	0.01	0.00				
Tin Sn				0.06	0.07	0.02	0.03	0.01				
Titanium Ti				5.45	2.61	0.81	1.01	0.27				
Uranium U				0.04	0.02	0.00	0.01	0.00				
Vanadium V				0.70	0.34	0.09	0.10	0.03				
Zinc Zn				0.7	0.3	0.2	0.6	0.2				
Zirconium Zr				2.01	0.99	0.32	0.40	0.11				

Table H 4-A-3
Scenario 4

Loadings to Tail Lake (kg/month)												
Date	Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter												
TDS				39611	20008	5250	7935	2082				
TSS				1751	811	255	322	84				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				709	424	108	192	50				
Chloride				28627	15089	4436	5785	1518				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				9003	5169	1417	1653	434				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				8	3	1	1	0				
Org. Carbon				2160.61	1167.15	314.99	330.61	86.77				
Hardness CaCO3				11883	7170	1942	2513	659				
Total Metals												
Aluminum Al				64.11	28.87	10.88	12.14	3.19				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.17	0.09	0.03	0.03	0.01				
Barium Ba				0.60	0.32	0.14	0.15	0.04				
Beryllium Be				0.07	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.01	0.00	0.00	0.00				
Boron B				11.58	5.86	1.89	2.24	0.59				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				2417	1226	457	537	141				
Chromium Cr				0.25	0.18	0.06	0.03	0.01				
Cobalt Co				0.06	0.03	0.01	0.01	0.00				
Copper Cu				0.51	0.25	0.06	0.08	0.02				
Iron Fe				71.67	31.85	12.37	14.62	3.84				
Lead Pb				0.03	0.01	0.01	0.00	0.00				
Lithium Li				1.75	0.81	0.26	0.32	0.08				
Magnesium Mg				2241	1128	394	439	115				
Manganese Mn				1.64	0.74	0.32	0.43	0.11				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.11	0.05	0.01	0.02	0.00				
Nickel Ni				0.25	0.12	0.03	0.04	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				1175	569	165	235	62				
Selenium Se				0.38	0.18	0.05	0.06	0.02				
Silicon SiO2				466	216	68	86	22				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				16449	8133	2524	3186	836				
Strontium Sr				12	6	2	3	1				
Tellurium Te				18.01	8.34	2.63	3.31	0.87				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.02	0.01	0.00	0.00	0.00				
Tin Sn				0.04	0.05	0.02	0.02	0.01				
Titanium Ti				5.46	2.53	0.80	1.00	0.26				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.66	0.30	0.08	0.09	0.02				
Zinc Zn				0.6	0.3	0.2	0.6	0.2				
Zirconium Zr				1.82	0.84	0.26	0.33	0.09				

Table H 4-A-3
Scenario 4

Loadings to Tail Lake (kg/month)												
Date	Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter												
TDS				39404	20534	5283	7918	2101				
TSS				1742	832	257	321	85				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				706	435	108	192	51				
Chloride				28478	15485	4464	5773	1532				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				8955	5305	1427	1650	438				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				8	3	1	1	0				
Org. Carbon				2149.31	1197.79	317.00	329.91	87.55				
Hardness CaCO3				11821	7358	1955	2507	665				
Total Metals												
Aluminum Al				63.77	29.62	10.95	12.12	3.22				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.17	0.09	0.03	0.03	0.01				
Barium Ba				0.59	0.33	0.14	0.15	0.04				
Beryllium Be				0.07	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.01	0.00	0.00	0.00				
Boron B				11.52	6.01	1.90	2.23	0.59				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				2404	1258	460	536	142				
Chromium Cr				0.25	0.18	0.06	0.03	0.01				
Cobalt Co				0.06	0.03	0.01	0.01	0.00				
Copper Cu				0.51	0.26	0.07	0.08	0.02				
Iron Fe				71.30	32.69	12.45	14.59	3.87				
Lead Pb				0.03	0.01	0.01	0.00	0.00				
Lithium Li				1.74	0.83	0.26	0.32	0.09				
Magnesium Mg				2229	1157	397	438	116				
Manganese Mn				1.63	0.76	0.32	0.43	0.11				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.11	0.05	0.01	0.02	0.01				
Nickel Ni				0.25	0.12	0.03	0.04	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				1169	584	166	234	62				
Selenium Se				0.38	0.18	0.05	0.06	0.02				
Silicon SiO2				463	221	68	85	23				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				16363	8347	2540	3179	844				
Strontium Sr				12	6	2	3	1				
Tellurium Te				17.91	8.56	2.64	3.30	0.88				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.02	0.01	0.00	0.00	0.00				
Tin Sn				0.04	0.06	0.02	0.02	0.01				
Titanium Ti				5.43	2.60	0.80	1.00	0.27				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.66	0.31	0.08	0.09	0.02				
Zinc Zn				0.6	0.3	0.2	0.6	0.2				
Zirconium Zr				1.81	0.86	0.27	0.33	0.09				

Table H 4-A-3
Scenario 4

Loadings to Tail Lake (kg/month)												
Date	Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter												
TDS				39602	20005	5249	7933	2082				
TSS				1751	811	255	321	84				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				709	423	108	192	50				
Chloride				28621	15087	4435	5784	1518				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				9001	5168	1417	1653	434				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				8	3	1	1	0				
Org. Carbon				2160.13	1166.94	314.93	330.53	86.75				
Hardness CaCO3				11881	7168	1942	2512	659				
Total Metals												
Aluminum Al				64.09	28.86	10.88	12.14	3.19				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.17	0.09	0.03	0.03	0.01				
Barium Ba				0.60	0.32	0.14	0.15	0.04				
Beryllium Be				0.07	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.01	0.00	0.00	0.00				
Boron B				11.57	5.86	1.89	2.24	0.59				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				2417	1226	457	537	141				
Chromium Cr				0.25	0.18	0.06	0.03	0.01				
Cobalt Co				0.06	0.03	0.01	0.01	0.00				
Copper Cu				0.51	0.25	0.06	0.08	0.02				
Iron Fe				71.65	31.85	12.37	14.62	3.84				
Lead Pb				0.03	0.01	0.01	0.00	0.00				
Lithium Li				1.75	0.81	0.25	0.32	0.08				
Magnesium Mg				2241	1128	394	439	115				
Manganese Mn				1.64	0.74	0.32	0.43	0.11				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.11	0.05	0.01	0.02	0.00				
Nickel Ni				0.25	0.12	0.03	0.04	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				1175	569	165	235	62				
Selenium Se				0.38	0.18	0.05	0.06	0.02				
Silicon SiO2				466	216	68	86	22				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				16445	8132	2524	3185	836				
Strontium Sr				12	6	2	3	1				
Tellurium Te				18.00	8.34	2.62	3.31	0.87				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.02	0.01	0.00	0.00	0.00				
Tin Sn				0.04	0.05	0.02	0.02	0.01				
Titanium Ti				5.46	2.53	0.80	1.00	0.26				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.66	0.30	0.08	0.09	0.02				
Zinc Zn				0.6	0.3	0.2	0.6	0.2				
Zirconium Zr				1.82	0.84	0.26	0.33	0.09				

Table H 4-A-3
Scenario 4

Loadings to Tail Lake (kg/month)												
Date	Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16	Year 10 Jan-17
Parameter												
TDS				39396	20529	5282	7916	2101				
TSS				1742	832	257	321	85				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				706	435	108	192	51				
Chloride				28472	15482	4463	5772	1532				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				8954	5303	1426	1649	438				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				8	3	1	1	0				
Org. Carbon				2148.87	1197.52	316.94	329.84	87.53				
Hardness CaCO3				11819	7356	1954	2507	665				
Total Metals												
Aluminum Al				63.76	29.62	10.95	12.11	3.21				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.17	0.09	0.03	0.03	0.01				
Barium Ba				0.59	0.33	0.14	0.15	0.04				
Beryllium Be				0.07	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.01	0.00	0.00	0.00				
Boron B				11.51	6.01	1.90	2.23	0.59				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				2404	1258	460	536	142				
Chromium Cr				0.25	0.18	0.06	0.03	0.01				
Cobalt Co				0.06	0.03	0.01	0.01	0.00				
Copper Cu				0.51	0.26	0.07	0.08	0.02				
Iron Fe				71.28	32.68	12.45	14.59	3.87				
Lead Pb				0.03	0.01	0.01	0.00	0.00				
Lithium Li				1.74	0.83	0.26	0.32	0.09				
Magnesium Mg				2229	1157	397	438	116				
Manganese Mn				1.63	0.76	0.32	0.43	0.11				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.11	0.05	0.01	0.02	0.01				
Nickel Ni				0.25	0.12	0.03	0.04	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				1168	584	166	234	62				
Selenium Se				0.38	0.18	0.05	0.06	0.02				
Silicon SiO2				463	221	68	85	23				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				16360	8345	2540	3178	843				
Strontium Sr				12	6	2	3	1				
Tellurium Te				17.91	8.55	2.64	3.30	0.88				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.02	0.01	0.00	0.00	0.00				
Tin Sn				0.04	0.06	0.02	0.02	0.01				
Titanium Ti				5.43	2.59	0.80	1.00	0.27				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.66	0.31	0.08	0.09	0.02				
Zinc Zn				0.6	0.3	0.2	0.6	0.2				
Zirconium Zr				1.81	0.86	0.27	0.33	0.09				

Table H-4-A-1
Scenario 4

OUTPUT SUMMARY						Fraction of CCME in Doris Creek (%)	
Discharge rate		1300000 m3/year					
Degradation Field(age)		Tail Lk Cu < CME Year		7			
		MMER	CCME	Tail Lake Year 2	Doris Creek Year 3	L'Roberts L Year 3	
Maximum Concentration							
pH			6 to 9	7 to 8	7 to 8	7 to 8	
TDS	mg/L			1377	227	202	
TSS	mg/L			3.8	7.0	8.1	
Free CN	mg/L		0.005	0.0025	0.00018	0.00010	4%
Total CN	mg/L	1.0		0.025	0.004	0.003	
WAD CN	mg/L			0.0034	0.0002	0.0001	
CNO	mg/L			2.8	0.20	0.11	
SCN	mg/L			0.099	0.007	0.004	
Sulphate	mg/L			92	9.1	7.4	
Chloride	mg/L			947	123	96	
Total Ammonia	mg/L		0.97	0.94	0.078	0.042	8%
Nitrate	mg/L		2.9	5.7	0.42	0.22	14%
Nitrite	mg/L		0.018	0.39	0.031	0.017	169%
Alkalinity	mg/L			56	29	27	
OrthoPhosphate-P	mg/L			0.1892	0.0141	0.0080	
Phosphate-P	mg/L			0.1953	0.0325	0.0313	
Org. Carbon	mg/L			4.7	7.5	7.2	
Hardness CaCO3	mg/L			109	50	47	
Total Metals							
Aluminum Al	mg/L		0.1	0.13	0.08	0.25	85%
Antimony Sb	mg/L			0.0171	0.0035	0.0022	
Arsenic As	mg/L	0.5	0.005	0.00	0.0006	0.0006	13%
Barium Ba	mg/L			0.0106	0.0035	0.0055	
Beryllium Be	mg/L			0.00064	0.00005	0.00003	
Bismuth Bi	mg/L			0.01654	0.00120	0.00072	
Boron B	mg/L			0.036	0.035	0.031	
Cadmium Cd	mg/L		0.000038	0.000056	0.0000070	0.0000166	18%
Calcium Ca	mg/L			248	25	17	
Chromium Cr	mg/L		0.001	0.0066	0.001	0.001	106%
Cobalt Co	mg/L			0.0103	0.0014	0.0007	
Copper Cu	mg/L	0.3	0.002	0.009	0.0020	0.0021	98%
Iron Fe	mg/L		0.3	0.14	0.13	0.28	42%
Lead Pb	mg/L	0.2	0.002	0.00041	0.00008	0.00027	4%
Lithium Li	mg/L			0.0054	0.0030	0.0030	
Magnesium Mg	mg/L			9.3	7.4	7.4	
Manganese Mn	mg/L			0.028	0.021	0.025	
Mercury Hg	mg/L		0.0001	0.0000107	0.0000014	0.0000010	1%
Molybdenum Mo	mg/L		0.073	0.0090	0.00077	0.00051	1%
Nickel Ni	mg/L	0.5	0.025	0.008	0.0010	0.0009	4%
Phosphorus P	mg/L			0.271	0.037	0.034	
Potassium K	mg/L			41	5.5	4.2	
Selenium Se	mg/L		0.001	0.00081	0.00090	0.00085	90%
Silicon SiO2	mg/L			4.0	0.75	0.65	
Silver Ag	mg/L		0.0001	0.00012	0.0000103	0.0000082	10%
Sodium Na	mg/L			293	57	48	
Strontium Sr	mg/L			0.089	0.044	0.048	
Tellurium Te	mg/L			0.039	0.050	0.051	
Thallium Tl	mg/L		0.0008	0.000042	0.000031	0.002002	4%
Thorium Th	mg/L			0.000053	0.0000054	0.0000028	
Tin Sn	mg/L			0.00262	0.00056	0.00010	
Titanium Ti	mg/L			0.0104	0.0063	0.0064	
Uranium U	mg/L			0.000080	0.000042	0.000046	
Vanadium V	mg/L			0.0039	0.0008	0.0006	
Zinc Zn	mg/L	0.5	0.03	0.023	0.0043	0.0058	14%
Zirconium Zr	mg/L			0.0045	0.0050	0.0052	

Table H-1-B-2
Scenario 4

Water Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter													
TDS	mg/L				140	121	125	145	145				
TSS	mg/L				4.0	5.9	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				2.8	2.7	2.9	3.0	3.0				
Chloride	mg/L				61	61	59	63	63				
Total Ammonia	mg/L				0.008	0.011	0.017	0.016	0.016				
Nitrate	mg/L				0.03	0.03	0.03	0.03	0.03				
Nitrite	mg/L				0.003	0.003	0.003	0.003	0.003				
Alkalinity	mg/L				28	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca	mg/L				9	8	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.024	0.020	0.020				
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.51	0.51	0.51	0.51	0.51				
Silver Ag	mg/L				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-1-B-2
Scenario 4

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter													
TDS	mg/L				159	139	143	165	166				
TSS	mg/L				3.9	5.6	5.7	6.7	6.7				
Free CN	mg/L				0.00018		0.00002	0.00003	0.00003				
Total CN	mg/L				0.004	0.002	0.002	0.002	0.002				
WAD CN	mg/L				0.0002		0.0000	0.0000	0.0000				
CNO	mg/L				0.20		0.03	0.03	0.03				
SCN	mg/L				0.005	0.005	0.005	0.005	0.006				
Sulphate	mg/L				7.3	6.7	7.1	7.7	8.0				
Chloride	mg/L				74	72	71	77	78				
Total Ammonia	mg/L				0.041	0.078	0.016	0.030	0.029				
Nitrate	mg/L				0.29	0.30	0.32	0.37	0.39				
Nitrite	mg/L				0.031	0.011	0.015	0.005	0.016				
Alkalinity	mg/L				29	26	28	28	28				
OrthoPhosphate-P	mg/L				0.0074	0.0066	0.0068	0.0075	0.0079				
Phosphate-P	mg/L				0.0222	0.0227	0.0286	0.0252	0.0256				
Org. Carbon	mg/L				5.3	5.0	7.2	4.9	4.9				
Hardness CaCO3	mg/L				48	45	45	47	47				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0009	0.0013	0.0033	0.0011	0.0012				
Arsenic As	mg/L				0.0006	0.0005	0.0005	0.0005	0.0005				
Barium Ba	mg/L				0.0032	0.0034	0.0033	0.0035	0.0035				
Beryllium Be	mg/L				0.00004	0.00003	0.00004	0.00004	0.00004				
Bismuth Bi	mg/L				0.00057	0.00057	0.00062	0.00069	0.00074				
Boron B	mg/L				0.034	0.022	0.023	0.023	0.023				
Cadmium Cd	mg/L				0.0000059	0.0000057	0.0000054	0.0000058	0.0000059				
Calcium Ca	mg/L				21	19	19	20	21				
Chromium Cr	mg/L				0.001	0.001	0.001	0.001	0.001				
Cobalt Co	mg/L				0.0006	0.0006	0.0013	0.0006	0.0007				
Copper Cu	mg/L				0.0016	0.0019	0.0016	0.0019	0.0019				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00004	0.00008	0.00006	0.00006	0.00006				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.6	6.6				
Manganese Mn	mg/L				0.008	0.021	0.014	0.011	0.011				
Mercury Hg	mg/L				0.0000009	0.0000009	0.0000009	0.0000009	0.0000010				
Molybdenum Mo	mg/L				0.00061	0.00055	0.00060	0.00063	0.00065				
Nickel Ni	mg/L				0.0008	0.0009	0.0008	0.0009	0.0009				
Phosphorus P	mg/L				0.027	0.027	0.033	0.030	0.031				
Potassium K	mg/L				4.8	4.1	4.2	4.4	4.5				
Selenium Se	mg/L				0.00086	0.00056	0.00060	0.00055	0.00055				
Silicon SiO2	mg/L				0.68	0.66	0.67	0.69	0.70				
Silver Ag	mg/L				0.0000079	0.0000081	0.0000083	0.0000088	0.0000089				
Sodium Na	mg/L				39	33	34	33	33				
Strontium Sr	mg/L				0.042	0.043	0.038	0.042	0.042				
Tellurium Te	mg/L				0.048	0.048	0.048	0.048	0.048				
Thallium Tl	mg/L				0.000031	0.000030	0.000031	0.000031	0.000031				
Thorium Th	mg/L				0.000002	0.000003	0.000003	0.000003	0.000003				
Tin Sn	mg/L				0.00046	0.00046	0.00047	0.00048	0.00049				
Titanium Ti	mg/L				0.0058	0.0058	0.0058	0.0059	0.0059				
Uranium U	mg/L				0.000027	0.000032	0.000040	0.000034	0.000034				
Vanadium V	mg/L				0.0007	0.0002	0.0004	0.0003	0.0003				
Zinc Zn	mg/L				0.0020	0.0040	0.0037	0.0028	0.0029				
Zirconium Zr	mg/L				0.0049	0.0049	0.0049	0.0049	0.0049				

Table H-1-B-2
Scenario 4

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter													
TDS	mg/L				172	157	170	203	215				
TSS	mg/L				3.9	5.6	5.8	6.7	6.7				
Free CN	mg/L				0.00013								
Total CN	mg/L				0.003	0.002	0.002	0.002	0.002				
WAD CN	mg/L				0.0002								
CNO	mg/L				0.14								
SCN	mg/L				0.007	0.006	0.005	0.006	0.005				
Sulphate	mg/L				9.1	7.9	7.9	8.3	8.2				
Chloride	mg/L				83	86	91	104	112				
Total Ammonia	mg/L				0.036	0.056	0.016	0.017	0.017				
Nitrate	mg/L				0.41	0.38	0.38	0.42	0.42				
Nitrite	mg/L				0.030	0.010	0.015	0.004	0.005				
Alkalinity	mg/L				29	27	28	28	28				
OrthoPhosphate-P	mg/L				0.0112	0.0097	0.0098	0.0108	0.0112				
Phosphate-P	mg/L				0.0260	0.0259	0.0318	0.0286	0.0290				
Org. Carbon	mg/L				5.3	5.0	7.2	4.9	4.9				
Hardness CaCO3	mg/L				50	46	46	47	47				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0013	0.0016	0.0035	0.0014	0.0015				
Arsenic As	mg/L				0.0006	0.0006	0.0005	0.0005	0.0005				
Barium Ba	mg/L				0.0034	0.0035	0.0034	0.0035	0.0035				
Beryllium Be	mg/L				0.00005	0.00004	0.00004	0.00005	0.00005				
Bismuth Bi	mg/L				0.00091	0.00084	0.00089	0.00099	0.00103				
Boron B	mg/L				0.034	0.023	0.024	0.023	0.023				
Cadmium Cd	mg/L				0.0000070	0.0000064	0.0000059	0.0000061	0.0000061				
Calcium Ca	mg/L				25	22	22	23	23				
Chromium Cr	mg/L				0.001	0.001	0.001	0.001	0.001				
Cobalt Co	mg/L				0.0008	0.0007	0.0014	0.0007	0.0007				
Copper Cu	mg/L				0.0018	0.0020	0.0017	0.0019	0.0019				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00005	0.00008	0.00006	0.00006	0.00006				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0030	0.0030				
Magnesium Mg	mg/L				7.4	6.7	6.7	6.7	6.7				
Manganese Mn	mg/L				0.008	0.021	0.014	0.011	0.011				
Mercury Hg	mg/L				0.0000010	0.0000011	0.0000011	0.0000012	0.0000012				
Molybdenum Mo	mg/L				0.00077	0.00065	0.00066	0.00066	0.00065				
Nickel Ni	mg/L				0.0010	0.0010	0.0009	0.0009	0.0009				
Phosphorus P	mg/L				0.032	0.031	0.037	0.034	0.035				
Potassium K	mg/L				5.5	4.6	4.5	4.5	4.5				
Selenium Se	mg/L				0.00087	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.75	0.71	0.70	0.72	0.71				
Silver Ag	mg/L				0.0000093	0.0000092	0.0000093	0.0000098	0.0000098				
Sodium Na	mg/L				40	37	41	43	47				
Strontium Sr	mg/L				0.044	0.044	0.038	0.043	0.043				
Tellurium Te	mg/L				0.048	0.048	0.048	0.049	0.049				
Thallium Tl	mg/L				0.000031	0.000031	0.000031	0.000031	0.000031				
Thorium Th	mg/L				0.000003	0.000003	0.000004	0.000004	0.000004				
Tin Sn	mg/L				0.00051	0.00050	0.00051	0.00053	0.00053				
Titanium Ti	mg/L				0.0059	0.0059	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000028	0.000033	0.000041	0.000035	0.000035				
Vanadium V	mg/L				0.0007	0.0003	0.0005	0.0004	0.0004				
Zinc Zn	mg/L				0.0025	0.0043	0.0039	0.0029	0.0029				
Zirconium Zr	mg/L				0.0049	0.0049	0.0049	0.0049	0.0049				

Table H-1-B-2
Scenario 4

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter													
TDS	mg/L				227	188	188	210	208				
TSS	mg/L				3.9	5.7	5.8	6.8	6.8				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.005	0.004	0.004	0.004	0.004				
Sulphate	mg/L				8.2	6.8	6.7	7.0	6.9				
Chloride	mg/L				123	108	104	110	109				
Total Ammonia	mg/L				0.012	0.011	0.017	0.016	0.016				
Nitrate	mg/L				0.38	0.32	0.31	0.33	0.33				
Nitrite	mg/L				0.012	0.002	0.003	0.003	0.003				
Alkalinity	mg/L				29	26	28	28	28				
OrthoPhosphate-P	mg/L				0.0141	0.0109	0.0104	0.0109	0.0106				
Phosphate-P	mg/L				0.0291	0.0273	0.0325	0.0289	0.0286				
Org. Carbon	mg/L				5.4	5.0	7.3	5.0	5.0				
Hardness CaCO3	mg/L				49	45	45	46	46				
Total Metals													
Aluminum Al	mg/L				0.04	0.06	0.08	0.08	0.08				
Antimony Sb	mg/L				0.0015	0.0017	0.0035	0.0013	0.0013				
Arsenic As	mg/L				0.0006	0.0005	0.0005	0.0005	0.0005				
Barium Ba	mg/L				0.0033	0.0034	0.0033	0.0034	0.0034				
Beryllium Be	mg/L				0.00005	0.00004	0.00004	0.00004	0.00004				
Bismuth Bi	mg/L				0.00120	0.00092	0.00088	0.00092	0.00089				
Boron B	mg/L				0.034	0.023	0.024	0.023	0.023				
Cadmium Cd	mg/L				0.0000065	0.0000059	0.0000055	0.0000057	0.0000057				
Calcium Ca	mg/L				24	20	19	19	19				
Chromium Cr	mg/L				0.001	0.001	0.001	0.001	0.001				
Cobalt Co	mg/L				0.0006	0.0006	0.0013	0.0005	0.0005				
Copper Cu	mg/L				0.0017	0.0018	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.05	0.12	0.09	0.09	0.09				
Lead Pb	mg/L				0.00005	0.00008	0.00006	0.00006	0.00006				
Lithium Li	mg/L				0.0030	0.0029	0.0029	0.0030	0.0030				
Magnesium Mg	mg/L				7.4	6.7	6.7	6.6	6.6				
Manganese Mn	mg/L				0.008	0.021	0.014	0.011	0.011				
Mercury Hg	mg/L				0.0000012	0.0000012	0.0000012	0.0000013	0.0000013				
Molybdenum Mo	mg/L				0.00064	0.00052	0.00053	0.00053	0.00052				
Nickel Ni	mg/L				0.0009	0.0009	0.0008	0.0008	0.0008				
Phosphorus P	mg/L				0.035	0.032	0.037	0.033	0.033				
Potassium K	mg/L				4.9	4.0	3.9	3.9	3.9				
Selenium Se	mg/L				0.00088	0.00058	0.00062	0.00057	0.00057				
Silicon SiO2	mg/L				0.71	0.67	0.67	0.68	0.68				
Silver Ag	mg/L				0.0000102	0.0000097	0.0000097	0.0000101	0.0000100				
Sodium Na	mg/L				57	47	47	46	46				
Strontium Sr	mg/L				0.043	0.043	0.038	0.042	0.042				
Tellurium Te	mg/L				0.049	0.049	0.049	0.049	0.049				
Thallium Tl	mg/L				0.000031	0.000031	0.000031	0.000031	0.000031				
Thorium Th	mg/L				0.000004	0.000004	0.000004	0.000005	0.000005				
Tin Sn	mg/L				0.00056	0.00052	0.00051	0.00052	0.00052				
Titanium Ti	mg/L				0.0061	0.0061	0.0062	0.0062	0.0062				
Uranium U	mg/L				0.000029	0.000034	0.000041	0.000036	0.000036				
Vanadium V	mg/L				0.0008	0.0003	0.0005	0.0004	0.0004				
Zinc Zn	mg/L				0.0022	0.0040	0.0037	0.0027	0.0027				
Zirconium Zr	mg/L				0.0049	0.0049	0.0049	0.0050	0.0050				

Table H-1-B-2
Scenario 4

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter													
TDS	mg/L				205	164	164	175	171				
TSS	mg/L				4.0	5.7	5.8	6.7	6.7				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.004	0.003	0.002	0.002	0.002				
Sulphate	mg/L				6.8	5.4	5.3	5.0	4.7				
Chloride	mg/L				108	92	88	86	83				
Total Ammonia	mg/L				0.008	0.013	0.017	0.016	0.016				
Nitrate	mg/L				0.28	0.22	0.21	0.19	0.18				
Nitrite	mg/L				0.003	0.003	0.003	0.003	0.003				
Alkalinity	mg/L				29	26	28	27	27				
OrthoPhosphate-P	mg/L				0.0107	0.0074	0.0069	0.0059	0.0052				
Phosphate-P	mg/L				0.0260	0.0241	0.0292	0.0240	0.0233				
Org. Carbon	mg/L				5.4	5.1	7.3	4.9	4.9				
Hardness CaCO3	mg/L				48	44	44	44	44				
Total Metals													
Aluminum Al	mg/L				0.04	0.06	0.08	0.08	0.08				
Antimony Sb	mg/L				0.0012	0.0014	0.0032	0.0009	0.0008				
Arsenic As	mg/L				0.0006	0.0005	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0032	0.0033	0.0031	0.0032	0.0031				
Beryllium Be	mg/L				0.00005	0.00004	0.00004	0.00003	0.00003				
Bismuth Bi	mg/L				0.00090	0.00062	0.00057	0.00048	0.00043				
Boron B	mg/L				0.035	0.023	0.024	0.023	0.023				
Cadmium Cd	mg/L				0.0000062	0.0000055	0.0000050	0.0000047	0.0000046				
Calcium Ca	mg/L				20	16	15	13	13				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0005	0.0004	0.0011	0.0003	0.0003				
Copper Cu	mg/L				0.0015	0.0017	0.0015	0.0016	0.0016				
Iron Fe	mg/L				0.06	0.13	0.09	0.09	0.09				
Lead Pb	mg/L				0.00004	0.00008	0.00006	0.00005	0.00005				
Lithium Li	mg/L				0.0030	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.4	6.6	6.7	6.5	6.4				
Manganese Mn	mg/L				0.007	0.020	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000013	0.0000013	0.0000014	0.0000013	0.0000013				
Molybdenum Mo	mg/L				0.00052	0.00040	0.00040	0.00035	0.00032				
Nickel Ni	mg/L				0.0008	0.0008	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.030	0.027	0.032	0.026	0.026				
Potassium K	mg/L				4.4	3.5	3.4	3.1	3.0				
Selenium Se	mg/L				0.00089	0.00059	0.00063	0.00057	0.00057				
Silicon SiO2	mg/L				0.68	0.63	0.63	0.61	0.60				
Silver Ag	mg/L				0.0000103	0.0000095	0.0000096	0.0000084	0.0000077				
Sodium Na	mg/L				52	42	43	39	38				
Strontium Sr	mg/L				0.042	0.043	0.037	0.040	0.040				
Tellurium Te	mg/L				0.049	0.049	0.049	0.049	0.049				
Thallium Tl	mg/L				0.000031	0.000031	0.000031	0.000030	0.000030				
Thorium Th	mg/L				0.000005	0.000005	0.000005	0.000005	0.000005				
Tin Sn	mg/L				0.00052	0.00047	0.00047	0.00045	0.00045				
Titanium Ti	mg/L				0.0063	0.0063	0.0063	0.0062	0.0062				
Uranium U	mg/L				0.000030	0.000034	0.000042	0.000035	0.000035				
Vanadium V	mg/L				0.0008	0.0002	0.0004	0.0003	0.0003				
Zinc Zn	mg/L				0.0019	0.0037	0.0034	0.0022	0.0021				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0049	0.0049				

Table H-1-B-2
Scenario 4

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter													
TDS	mg/L				163	136	139	154	152				
TSS	mg/L				3.9	5.7	5.8	6.7	6.7				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.002	0.001	0.001	0.001	0.001				
Sulphate	mg/L				4.4	3.7	3.8	3.7	3.6				
Chloride	mg/L				79	73	70	72	70				
Total Ammonia	mg/L				0.005	0.010	0.014	0.013	0.013				
Nitrate	mg/L				0.09	0.08	0.09	0.08	0.08				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				27	25	27	26	26				
OrthoPhosphate-P	mg/L				0.0048	0.0035	0.0033	0.0029	0.0026				
Phosphate-P	mg/L				0.0200	0.0201	0.0256	0.0210	0.0207				
Org. Carbon	mg/L				5.4	5.0	7.3	4.9	4.9				
Hardness CaCO3	mg/L				45	42	42	43	43				
Total Metals													
Aluminum Al	mg/L				0.04	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0007	0.0010	0.0029	0.0006	0.0006				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0031	0.0030	0.0030	0.0030				
Beryllium Be	mg/L				0.00003	0.00002	0.00002	0.00002	0.00002				
Bismuth Bi	mg/L				0.00039	0.00027	0.00025	0.00022	0.00019				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000041	0.0000039	0.0000035	0.0000033	0.0000032				
Calcium Ca	mg/L				13	11	10	10	9				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0009	0.0002	0.0002				
Copper Cu	mg/L				0.0013	0.0016	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.06	0.12	0.09	0.09	0.09				
Lead Pb	mg/L				0.00003	0.00007	0.00005	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0029	0.0028	0.0028				
Magnesium Mg	mg/L				7.2	6.4	6.5	6.3	6.3				
Manganese Mn	mg/L				0.007	0.020	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000011	0.0000012	0.0000012	0.0000012	0.0000011				
Molybdenum Mo	mg/L				0.00030	0.00025	0.00027	0.00024	0.00023				
Nickel Ni	mg/L				0.0006	0.0007	0.0006	0.0005	0.0005				
Phosphorus P	mg/L				0.022	0.021	0.027	0.022	0.021				
Potassium K	mg/L				3.4	2.8	2.8	2.6	2.6				
Selenium Se	mg/L				0.00088	0.00058	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.58	0.56	0.57	0.55	0.55				
Silver Ag	mg/L				0.0000063	0.0000065	0.0000067	0.0000059	0.0000054				
Sodium Na	mg/L				44	36	38	35	34				
Strontium Sr	mg/L				0.040	0.041	0.036	0.039	0.039				
Tellurium Te	mg/L				0.048	0.049	0.049	0.049	0.048				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000003	0.000003	0.000004	0.000003	0.000003				
Tin Sn	mg/L				0.00044	0.00042	0.00042	0.00041	0.00041				
Titanium Ti	mg/L				0.0061	0.0062	0.0062	0.0062	0.0061				
Uranium U	mg/L				0.000027	0.000032	0.000040	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0002	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0013	0.0033	0.0030	0.0019	0.0019				
Zirconium Zr	mg/L				0.0049	0.0049	0.0049	0.0049	0.0049				

Table H-1-B-2
Scenario 4

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter													
TDS	mg/L				147	125	125	145	145				
TSS	mg/L				3.9	5.7	5.7	6.7	6.7				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.001	0.000	0.000	0.000	0.000				
Sulphate	mg/L				3.5	3.1	3.0	3.2	3.2				
Chloride	mg/L				68	65	61	65	65				
Total Ammonia	mg/L				0.005	0.007	0.013	0.012	0.012				
Nitrate	mg/L				0.03	0.02	0.01	0.01	0.01				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				27	25	26	26	26				
OrthoPhosphate-P	mg/L				0.0026	0.0020	0.0016	0.0016	0.0016				
Phosphate-P	mg/L				0.0178	0.0186	0.0237	0.0196	0.0196				
Org. Carbon	mg/L				5.3	5.0	7.2	4.9	4.9				
Hardness CaCO3	mg/L				44	42	41	43	43				
Total Metals													
Aluminum Al	mg/L				0.04	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0005	0.0009	0.0027	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0028	0.0030	0.0029	0.0030	0.0030				
Beryllium Be	mg/L				0.00002	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00019	0.00014	0.00010	0.00010	0.00010				
Boron B	mg/L				0.033	0.022	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000037	0.0000033	0.0000026	0.0000026	0.0000026				
Calcium Ca	mg/L				10	9	8	8	8				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0002	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0012	0.0015	0.0015				
Iron Fe	mg/L				0.06	0.12	0.09	0.09	0.09				
Lead Pb	mg/L				0.00003	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.1	6.4	6.4	6.3	6.3				
Manganese Mn	mg/L				0.007	0.020	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000011	0.0000011	0.0000010	0.0000011	0.0000011				
Molybdenum Mo	mg/L				0.00022	0.00020	0.00021	0.00019	0.00019				
Nickel Ni	mg/L				0.0005	0.0006	0.0005	0.0005	0.0005				
Phosphorus P	mg/L				0.018	0.019	0.024	0.020	0.020				
Potassium K	mg/L				3.0	2.6	2.5	2.4	2.4				
Selenium Se	mg/L				0.00088	0.00057	0.00061	0.00056	0.00056				
Silicon SiO2	mg/L				0.55	0.54	0.52	0.53	0.53				
Silver Ag	mg/L				0.0000054	0.0000056	0.0000043	0.0000046	0.0000045				
Sodium Na	mg/L				41	34	35	33	33				
Strontium Sr	mg/L				0.040	0.041	0.035	0.039	0.039				
Tellurium Te	mg/L				0.048	0.048	0.048	0.048	0.048				
Thallium Tl	mg/L				0.000030	0.000029	0.000029	0.000029	0.000029				
Thorium Th	mg/L				0.000003	0.000003	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00041	0.00040	0.00039	0.00039	0.00039				
Titanium Ti	mg/L				0.0061	0.0062	0.0061	0.0061	0.0061				
Uranium U	mg/L				0.000027	0.000032	0.000038	0.000032	0.000032				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0011	0.0032	0.0028	0.0017	0.0018				
Zirconium Zr	mg/L				0.0049	0.0049	0.0048	0.0048	0.0048				

Table H-1-B-2
Scenario 4

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter													
TDS	mg/L				139	120	124	142	141				
TSS	mg/L				3.9	5.6	5.8	6.7	6.7				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.000	0.000	0.000	0.000	0.000				
Sulphate	mg/L				3.0	2.8	2.9	3.0	3.0				
Chloride	mg/L				63	62	60	63	63				
Total Ammonia	mg/L				0.005	0.007	0.013	0.012	0.012				
Nitrate	mg/L				0.01	0.01	0.01	0.01	0.01				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				27	25	26	26	26				
OrthoPhosphate-P	mg/L				0.0015	0.0013	0.0012	0.0012	0.0011				
Phosphate-P	mg/L				0.0167	0.0178	0.0235	0.0192	0.0191				
Org. Carbon	mg/L				5.3	5.0	7.2	4.9	4.9				
Hardness CaCO3	mg/L				44	41	41	42	42				
Total Metals													
Aluminum Al	mg/L				0.04	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0027	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0027	0.0030	0.0029	0.0030	0.0030				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00009	0.00007	0.00007	0.00006	0.00006				
Boron B	mg/L				0.033	0.022	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000030	0.0000029	0.0000025	0.0000024	0.0000024				
Calcium Ca	mg/L				9	8	8	8	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0002	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0012	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.12	0.09	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	6.4	6.4	6.3	6.3				
Manganese Mn	mg/L				0.006	0.020	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000011	0.0000011	0.0000012	0.0000011	0.0000011				
Molybdenum Mo	mg/L				0.00018	0.00017	0.00020	0.00017	0.00017				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.023	0.019	0.019				
Potassium K	mg/L				2.9	2.5	2.4	2.4	2.3				
Selenium Se	mg/L				0.00087	0.00057	0.00062	0.00056	0.00055				
Silicon SiO2	mg/L				0.52	0.52	0.53	0.52	0.52				
Silver Ag	mg/L				0.0000043	0.0000048	0.0000050	0.0000044	0.0000039				
Sodium Na	mg/L				39	33	35	32	32				
Strontium Sr	mg/L				0.039	0.040	0.035	0.039	0.038				
Tellurium Te	mg/L				0.048	0.048	0.049	0.048	0.048				
Thallium Tl	mg/L				0.000029	0.000029	0.000029	0.000029	0.000029				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00039	0.00039	0.00039	0.00039	0.00038				
Titanium Ti	mg/L				0.0061	0.0061	0.0062	0.0062	0.0061				
Uranium U	mg/L				0.000026	0.000031	0.000039	0.000032	0.000032				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0010	0.0031	0.0028	0.0017	0.0017				
Zirconium Zr	mg/L				0.0048	0.0048	0.0049	0.0048	0.0048				

Table H-1-B-2
Scenario 4

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter													
TDS	mg/L				136	118	121	140	140				
TSS	mg/L				3.9	5.6	5.7	6.7	6.7				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.000	0.000	0.000	0.000	0.000				
Sulphate	mg/L				2.8	2.7	2.8	2.9	2.9				
Chloride	mg/L				61	60	58	62	62				
Total Ammonia	mg/L				0.005	0.007	0.013	0.012	0.012				
Nitrate	mg/L				0.01	0.01	0.01	0.01	0.01				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				27	25	26	26	26				
OrthoPhosphate-P	mg/L				0.0011	0.0010	0.0009	0.0009	0.0009				
Phosphate-P	mg/L				0.0163	0.0176	0.0230	0.0189	0.0189				
Org. Carbon	mg/L				5.3	5.0	7.2	4.9	4.9				
Hardness CaCO3	mg/L				44	41	41	42	42				
Total Metals													
Aluminum Al	mg/L				0.04	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0027	0.0004	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0027	0.0030	0.0028	0.0029	0.0029				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00006	0.00005	0.00004	0.00004	0.00004				
Boron B	mg/L				0.033	0.022	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000028	0.0000028	0.0000022	0.0000022	0.0000023				
Calcium Ca	mg/L				9	8	7	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0001	0.0008	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0012	0.0014	0.0014				
Iron Fe	mg/L				0.05	0.12	0.09	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	6.3	6.4	6.3	6.3				
Manganese Mn	mg/L				0.006	0.020	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000011	0.0000011	0.0000010	0.0000010	0.0000011				
Molybdenum Mo	mg/L				0.00017	0.00016	0.00018	0.00017	0.00017				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.016	0.017	0.023	0.019	0.019				
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3				
Selenium Se	mg/L				0.00087	0.00057	0.00061	0.00055	0.00055				
Silicon SiO2	mg/L				0.52	0.52	0.51	0.51	0.52				
Silver Ag	mg/L				0.0000040	0.0000047	0.0000037	0.0000039	0.0000038				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.039	0.040	0.034	0.038	0.038				
Tellurium Te	mg/L				0.048	0.048	0.048	0.048	0.048				
Thallium Tl	mg/L				0.000029	0.000029	0.000029	0.000029	0.000029				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00038	0.00038	0.00038	0.00038	0.00038				
Titanium Ti	mg/L				0.0061	0.0062	0.0061	0.0061	0.0061				
Uranium U	mg/L				0.000026	0.000031	0.000038	0.000032	0.000032				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0010	0.0031	0.0027	0.0017	0.0017				
Zirconium Zr	mg/L				0.0048	0.0048	0.0048	0.0048	0.0048				

Table H-1-B-2
Scenario 4

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16
Parameter												
TDS	mg/L				135	117	121	139	139			
TSS	mg/L				3.9	5.6	5.8	6.7	6.7			
Free CN	mg/L											
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002			
WAD CN	mg/L											
CNO	mg/L											
SCN	mg/L				0.000	0.000	0.000	0.000	0.000			
Sulphate	mg/L				2.7	2.6	2.8	2.9	2.9			
Chloride	mg/L				60	60	58	62	61			
Total Ammonia	mg/L				0.005	0.007	0.013	0.012	0.012			
Nitrate	mg/L				0.01	0.01	0.01	0.01	0.01			
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002			
Alkalinity	mg/L				26	25	26	26	26			
OrthoPhosphate-P	mg/L				0.0009	0.0009	0.0009	0.0008	0.0008			
Phosphate-P	mg/L				0.0161	0.0174	0.0232	0.0189	0.0188			
Org. Carbon	mg/L				5.3	5.0	7.2	4.9	4.9			
Hardness CaCO3	mg/L				44	41	41	42	42			
Total Metals												
Aluminum Al	mg/L				0.04	0.06	0.08	0.07	0.07			
Antimony Sb	mg/L				0.0004	0.0008	0.0027	0.0004	0.0004			
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004			
Barium Ba	mg/L				0.0027	0.0030	0.0029	0.0029	0.0029			
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001			
Bismuth Bi	mg/L				0.00004	0.00004	0.00004	0.00004	0.00003			
Boron B	mg/L				0.033	0.022	0.023	0.022	0.022			
Cadmium Cd	mg/L				0.0000027	0.0000027	0.0000023	0.0000022	0.0000022			
Calcium Ca	mg/L				8	8	7	7	7			
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000			
Cobalt Co	mg/L				0.0001	0.0001	0.0008	0.0001	0.0001			
Copper Cu	mg/L				0.0012	0.0015	0.0012	0.0014	0.0014			
Iron Fe	mg/L				0.05	0.12	0.09	0.09	0.09			
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004			
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028			
Magnesium Mg	mg/L				7.0	6.3	6.4	6.3	6.3			
Manganese Mn	mg/L				0.006	0.019	0.013	0.010	0.010			
Mercury Hg	mg/L				0.0000010	0.0000011	0.0000011	0.0000011	0.0000011			
Molybdenum Mo	mg/L				0.00016	0.00016	0.00018	0.00016	0.00016			
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004			
Phosphorus P	mg/L				0.016	0.017	0.023	0.018	0.018			
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3			
Selenium Se	mg/L				0.00087	0.00057	0.00062	0.00056	0.00055			
Silicon SiO2	mg/L				0.51	0.51	0.52	0.51	0.51			
Silver Ag	mg/L				0.0000037	0.0000044	0.0000047	0.0000041	0.0000037			
Sodium Na	mg/L				38	33	34	32	32			
Strontium Sr	mg/L				0.039	0.040	0.035	0.038	0.038			
Tellurium Te	mg/L				0.048	0.048	0.049	0.048	0.048			
Thallium Tl	mg/L				0.000029	0.000029	0.000029	0.000029	0.000029			
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002			
Tin Sn	mg/L				0.00038	0.00038	0.00038	0.00038	0.00038			
Titanium Ti	mg/L				0.0061	0.0061	0.0062	0.0061	0.0061			
Uranium U	mg/L				0.000026	0.000030	0.000038	0.000032	0.000032			
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002			
Zinc Zn	mg/L				0.0010	0.0030	0.0027	0.0017	0.0017			
Zirconium Zr	mg/L				0.0048	0.0048	0.0049	0.0048	0.0048			

Table H 4-A-3
Scenario 4**Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter												
TDS				1007213	541020	235008	348940	121765				
TSS				28778	26214	11280	16845	5878				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN												
Sulphate				20357	12213	5395	7242	2527				
Chloride				435260	269952	109984	150405	52485				
Total Ammonia				60	50	33	39	14				
Nitrate				231	143	60	77	27				
Nitrite				19	12	5	6	2				
Alkalinity				197845	113224	50762	63772	22254				
OrthoPhosphate-P				5	3	1	2	1				
Phosphate-P				119	80	45	47	16				
Org. Carbon				39569	22868	14100	12032	4199				
Hardness CaCO3				327344	190751	79903	105885	36950				
Total Metals												
Aluminum Al				244	270	153	175	61				
Antimony Sb				2.6	3.7	5.4	1.1	0.4				
Arsenic As				3.5	1.8	0.7	0.9	0.3				
Barium Ba				21	14	6	7	3				
Beryllium Be				0.06	0.03	0.01	0.02	0.01				
Bismuth Bi				0.24	0.15	0.06	0.08	0.03				
Boron B				249	101	44	54	19				
Cadmium Cd				0.02	0.01	0.01	0.01	0.00				
Calcium Ca				61239	35036	14368	17701	6177				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.36	0.62	1.67	0.19	0.07				
Copper Cu				9	7	2	4	1				
Iron Fe				368	558	160	218	76				
Lead Pb				0.15	0.29	0.08	0.09	0.03				
Lithium Li				20	13	5	7	2				
Magnesium Mg				52549	29290	12454	15596	5442				
Manganese Mn				48	93	25	24	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.13	0.68	0.34	0.39	0.13				
Nickel Ni				2.93	2.55	0.87	1.05	0.37				
Phosphorus P				122	82	46	48	17				
Potassium K				20296	10803	4524	5634	1966				
Selenium Se				6.48	2.56	1.17	1.35	0.47				
Silicon SiO2				3654	2266	955	1222	427				
Silver Ag				0.01	0.01	0.00	0.00	0.00				
Sodium Na				282747	147697	64676	77331	26985				
Strontium Sr				292	188	67	96	34				
Tellurium Te				360	223	94	120	42				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				2.90	1.80	0.76	0.97	0.34				
Titanium Ti				43	27	11	14	5				
Uranium U				0.19	0.14	0.07	0.08	0.03				
Vanadium V				4.01	0.23	0.45	0.35	0.12				
Zinc Zn				6.60	14.17	5.37	4.12	1.44				
Zirconium Zr				36	22	9	12	4				

Table H 4-A-3
Scenario 4**Solute Loadings in D**
Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)

Date	Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter												
TDS				1232852	666865	290512	427687	150612				
TSS				30051	26979	11620	17315	6047				
Free CN				1.42		0.05	0.07	0.02				
Total CN				28	9	4	5	2				
WAD CN				1.89		0.07	0.09	0.03				
CNO				1562		55	73	25				
SCN				40	22	10	14	5				
Sulphate				56683	32438	14358	20052	7250				
Chloride				570872	346840	144327	199380	70530				
Total Ammonia				319	375	33	77	26				
Nitrate				2224	1421	644	948	350				
Nitrite				239	55	30	12	15				
Alkalinity				221594	126771	56787	72252	25337				
OrthoPhosphate-P				57	32	14	20	7				
Phosphate-P				172	109	58	65	23				
Org. Carbon				41249	23923	14579	12683	4428				
Hardness CaCO3				372857	216371	91269	121960	42822				
Total Metals												
Aluminum Al				263	281	158	183	64				
Antimony Sb				7.1	6.4	6.6	2.9	1.1				
Arsenic As				4.6	2.5	1.0	1.3	0.5				
Barium Ba				25	16	7	9	3				
Beryllium Be				0.28	0.16	0.07	0.10	0.04				
Bismuth Bi				4.45	2.74	1.26	1.80	0.67				
Boron B				260	108	47	58	20				
Cadmium Cd				0.05	0.03	0.01	0.01	0.01				
Calcium Ca				160330	89415	38294	51901	18765				
Chromium Cr				7	3	2	2	1				
Cobalt Co				4.47	2.89	2.68	1.62	0.59				
Copper Cu				12	9	3	5	2				
Iron Fe				392	573	166	227	79				
Lead Pb				0.31	0.38	0.12	0.15	0.05				
Lithium Li				22	14	6	8	3				
Magnesium Mg				56451	31547	13461	17018	5961				
Manganese Mn				59	99	28	28	10				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				4.72	2.65	1.21	1.62	0.59				
Nickel Ni				6.23	4.40	1.69	2.22	0.80				
Phosphorus P				208	130	67	79	28				
Potassium K				36844	19891	8522	11343	4066				
Selenium Se				6.69	2.69	1.23	1.42	0.50				
Silicon SiO2				5279	3184	1361	1799	638				
Silver Ag				0.06	0.04	0.02	0.02	0.01				
Sodium Na				302508	158857	69621	84320	29538				
Strontium Sr				329	208	76	109	38				
Tellurium Te				374	232	98	126	44				
Thallium Tl				0.24	0.15	0.06	0.08	0.03				
Thorium Th				0.02	0.01	0.01	0.01	0.00				
Tin Sn				3.57	2.21	0.95	1.25	0.44				
Titanium Ti				45	28	12	15	5				
Uranium U				0.21	0.15	0.08	0.09	0.03				
Vanadium V				5.22	0.95	0.78	0.82	0.29				
Zinc Zn				15.63	19.19	7.59	7.29	2.61				
Zirconium Zr				38	23	10	13	4				

Table H 4-A-3
Scenario 4**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter												
TDS				1331507	756589	345370	527514	194342				
TSS				30254	27143	11696	17416	6081				
Free CN				0.99								
Total CN				24	9	4	5	2				
WAD CN				1.32								
CNO				1087								
SCN				54	27	11	14	5				
Sulphate				70513	37943	15977	21484	7452				
Chloride				646699	413556	184065	270195	101170				
Total Ammonia				277	269	33	44	15				
Nitrate				3176	1817	769	1077	378				
Nitrite				236	48	30	10	4				
Alkalinity				227968	129268	57493	72821	25380				
OrthoPhosphate-P				87	46	20	28	10				
Phosphate-P				202	124	64	74	26				
Org. Carbon				41352	23994	14614	12737	4448				
Hardness CaCO3				386313	221536	92678	123008	42849				
Total Metals												
Aluminum Al				270	290	163	190	66				
Antimony Sb				9.7	7.8	7.2	3.7	1.3				
Arsenic As				5.0	2.6	1.0	1.4	0.5				
Barium Ba				26	17	7	9	3				
Beryllium Be				0.36	0.20	0.09	0.12	0.04				
Bismuth Bi				7.02	4.06	1.81	2.56	0.93				
Boron B				264	110	48	60	21				
Cadmium Cd				0.05	0.03	0.01	0.02	0.01				
Calcium Ca				195116	104959	43832	58578	20735				
Chromium Cr				8	3	2	2	1				
Cobalt Co				5.98	3.46	2.83	1.74	0.60				
Copper Cu				14	9	3	5	2				
Iron Fe				398	581	170	233	82				
Lead Pb				0.37	0.41	0.13	0.17	0.06				
Lithium Li				23	14	6	8	3				
Magnesium Mg				57616	32122	13671	17258	6026				
Manganese Mn				63	101	28	29	10				
Mercury Hg				0.01	0.01	0.00	0.00	0.00				
Molybdenum Mo				5.98	3.13	1.33	1.71	0.59				
Nickel Ni				7.47	4.90	1.84	2.36	0.82				
Phosphorus P				252	151	75	89	31				
Potassium K				42570	22083	9104	11738	4053				
Selenium Se				6.74	2.73	1.25	1.45	0.51				
Silicon SiO2				5796	3398	1425	1854	645				
Silver Ag				0.07	0.04	0.02	0.03	0.01				
Sodium Na				308243	176660	83335	111532	42109				
Strontium Sr				340	213	78	111	39				
Tellurium Te				375	232	98	126	44				
Thallium Tl				0.24	0.15	0.06	0.08	0.03				
Thorium Th				0.02	0.02	0.01	0.01	0.00				
Tin Sn				3.97	2.42	1.04	1.37	0.48				
Titanium Ti				45	29	12	16	5				
Uranium U				0.22	0.16	0.08	0.09	0.03				
Vanadium V				5.77	1.26	0.91	0.99	0.35				
Zinc Zn				19.01	20.55	7.99	7.64	2.66				
Zirconium Zr				38	24	10	13	4				

Table H 4-A-3
Scenario 4**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter												
TDS				1762749	903783	380811	545504	188615				
TSS				30499	27271	11755	17508	6114				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				41	19	8	10	4				
Sulphate				63286	32632	13561	18238	6260				
Chloride				954505	519457	210353	285797	98542				
Total Ammonia				91	55	35	41	14				
Nitrate				2917	1525	630	856	296				
Nitrite				93	12	6	7	2				
Alkalinity				224197	126933	56564	71710	25001				
OrthoPhosphate-P				109	53	21	28	10				
Phosphate-P				226	131	66	75	26				
Org. Carbon				41678	24165	14694	12861	4491				
Hardness CaCO3				377037	215897	90393	120177	41879				
Total Metals												
Aluminum Al				290	301	168	196	69				
Antimony Sb				12.0	8.2	7.1	3.5	1.2				
Arsenic As				4.9	2.5	1.0	1.3	0.4				
Barium Ba				25	16	7	9	3				
Beryllium Be				0.42	0.21	0.09	0.12	0.04				
Bismuth Bi				9.31	4.44	1.77	2.38	0.81				
Boron B				267	111	48	60	21				
Cadmium Cd				0.05	0.03	0.01	0.01	0.01				
Calcium Ca				189044	95843	38677	50439	17286				
Chromium Cr				8	3	1	1	0				
Cobalt Co				4.89	2.77	2.54	1.35	0.46				
Copper Cu				13	9	3	5	2				
Iron Fe				417	592	175	240	84				
Lead Pb				0.38	0.40	0.12	0.16	0.05				
Lithium Li				23	14	6	8	3				
Magnesium Mg				57628	32005	13611	17191	5998				
Manganese Mn				61	99	28	28	10				
Mercury Hg				0.01	0.01	0.00	0.00	0.00				
Molybdenum Mo				4.93	2.49	1.07	1.36	0.47				
Nickel Ni				6.89	4.46	1.64	2.09	0.72				
Phosphorus P				271	153	75	87	30				
Potassium K				37871	19277	7937	10239	3534				
Selenium Se				6.82	2.77	1.27	1.48	0.52				
Silicon SiO2				5507	3214	1349	1759	612				
Silver Ag				0.08	0.05	0.02	0.03	0.01				
Sodium Na				439202	223962	95589	119141	41258				
Strontium Sr				334	209	76	109	38				
Tellurium Te				377	234	99	127	44				
Thallium Tl				0.24	0.15	0.06	0.08	0.03				
Thorium Th				0.03	0.02	0.01	0.01	0.00				
Tin Sn				4.34	2.49	1.04	1.35	0.47				
Titanium Ti				47	29	12	16	6				
Uranium U				0.22	0.16	0.08	0.09	0.03				
Vanadium V				6.17	1.35	0.92	0.99	0.34				
Zinc Zn				17.19	19.28	7.43	6.90	2.40				
Zirconium Zr				38	24	10	13	5				

Table H 4-A-3
Scenario 4**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter												
TDS				1586388	790071	332750	454595	154434				
TSS				30846	27424	11825	17460	6079				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				30	13	5	5	2				
Sulphate				52677	25842	10686	12946	4284				
Chloride				834318	441816	177559	223544	75111				
Total Ammonia				62	62	35	41	14				
Nitrate				2167	1044	435	495	161				
Nitrite				20	14	6	7	2				
Alkalinity				221761	124971	55788	69336	24023				
OrthoPhosphate-P				83	36	14	15	5				
Phosphate-P				201	116	59	62	21				
Org. Carbon				42128	24363	14790	12810	4450				
Hardness CaCO3				370217	210965	88382	115221	39907				
Total Metals												
Aluminum Al				310	311	172	197	68				
Antimony Sb				9.6	6.6	6.5	2.3	0.8				
Arsenic As				4.6	2.4	0.9	1.2	0.4				
Barium Ba				24	16	6	8	3				
Beryllium Be				0.36	0.17	0.07	0.08	0.03				
Bismuth Bi				6.99	2.97	1.15	1.25	0.39				
Boron B				268	112	49	59	21				
Cadmium Cd				0.05	0.03	0.01	0.01	0.00				
Calcium Ca				157429	75622	30111	34681	11401				
Chromium Cr				7	2	1	1	0				
Cobalt Co				3.76	2.05	2.23	0.79	0.25				
Copper Cu				12	8	3	4	1				
Iron Fe				438	602	179	241	84				
Lead Pb				0.34	0.38	0.11	0.13	0.05				
Lithium Li				23	14	6	8	3				
Magnesium Mg				57399	31759	13516	16784	5824				
Manganese Mn				58	98	27	26	9				
Mercury Hg				0.01	0.01	0.00	0.00	0.00				
Molybdenum Mo				4.00	1.90	0.82	0.90	0.29				
Nickel Ni				5.99	3.88	1.40	1.62	0.54				
Phosphorus P				235	130	65	68	23				
Potassium K				33886	16697	6846	8149	2746				
Selenium Se				6.91	2.82	1.29	1.48	0.51				
Silicon SiO2				5268	3041	1277	1577	539				
Silver Ag				0.08	0.05	0.02	0.02	0.01				
Sodium Na				406532	202513	86557	101137	34401				
Strontium Sr				329	205	75	104	36				
Tellurium Te				381	235	100	127	44				
Thallium Tl				0.24	0.15	0.06	0.08	0.03				
Thorium Th				0.04	0.02	0.01	0.01	0.00				
Tin Sn				4.02	2.28	0.95	1.18	0.40				
Titanium Ti				48	30	13	16	6				
Uranium U				0.23	0.17	0.09	0.09	0.03				
Vanadium V				5.91	1.16	0.84	0.78	0.26				
Zinc Zn				15.01	17.82	6.81	5.68	1.94				
Zirconium Zr				39	24	10	13	4				

Table H 4-A-3
Scenario 4**Solute Loadings in DSolute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter												
TDS				1260753	655391	281037	399241	137526				
TSS				30360	27220	11746	17377	6054				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				12	5	2	2	1				
Sulphate				33797	17999	7672	9709	3292				
Chloride				610884	349406	142074	185561	63509				
Total Ammonia				38	47	29	33	12				
Nitrate				690	391	179	211	71				
Nitrite				15	11	5	5	2				
Alkalinity				211677	120790	54175	67617	23499				
OrthoPhosphate-P				37	17	7	7	2				
Phosphate-P				155	97	52	54	19				
Org. Carbon				41540	24116	14694	12708	4419				
Hardness CaCO3				350449	202778	85228	111855	38880				
Total Metals												
Aluminum Al				296	304	169	194	67				
Antimony Sb				5.5	4.9	5.8	1.6	0.5				
Arsenic As				4.0	2.1	0.8	1.0	0.4				
Barium Ba				22	15	6	8	3				
Beryllium Be				0.20	0.10	0.04	0.05	0.02				
Bismuth Bi				2.99	1.31	0.51	0.56	0.18				
Boron B				261	109	47	58	20				
Cadmium Cd				0.03	0.02	0.01	0.01	0.00				
Calcium Ca				101433	52407	21193	25115	8474				
Chromium Cr				6	2	1	1	0				
Cobalt Co				1.76	1.22	1.91	0.44	0.14				
Copper Cu				10	8	3	4	1				
Iron Fe				427	597	178	239	83				
Lead Pb				0.23	0.32	0.09	0.11	0.04				
Lithium Li				22	14	6	7	3				
Magnesium Mg				55508	30968	13210	16456	5723				
Manganese Mn				53	95	26	25	9				
Mercury Hg				0.01	0.01	0.00	0.00	0.00				
Molybdenum Mo				2.35	1.22	0.55	0.62	0.21				
Nickel Ni				4.27	3.16	1.12	1.32	0.45				
Phosphorus P				167	101	54	56	19				
Potassium K				26344	13575	5648	6866	2354				
Selenium Se				6.80	2.77	1.27	1.46	0.51				
Silicon SiO2				4478	2701	1145	1433	495				
Silver Ag				0.05	0.03	0.01	0.02	0.00				
Sodium Na				340410	175152	76044	89892	30967				
Strontium Sr				313	198	72	102	35				
Tellurium Te				376	233	99	126	44				
Thallium Tl				0.23	0.14	0.06	0.08	0.03				
Thorium Th				0.02	0.02	0.01	0.01	0.00				
Tin Sn				3.38	2.01	0.84	1.06	0.37				
Titanium Ti				48	30	13	16	6				
Uranium U				0.21	0.15	0.08	0.09	0.03				
Vanadium V				5.02	0.78	0.70	0.62	0.21				
Zinc Zn				10.43	15.90	6.07	4.89	1.70				
Zirconium Zr				38	23	10	13	4				

Table H 4-A-3
Scenario 4**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter												
TDS				1139182	603320	253758	374760	130788				
TSS				30268	27186	11608	17314	6049				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				6	2	1	1	0				
Sulphate				26743	14943	6168	8299	2891				
Chloride				527592	313728	123233	168725	58893				
Total Ammonia				38	36	26	31	11				
Nitrate				195	90	29	38	13				
Nitrite				15	9	4	5	2				
Alkalinity				208361	119387	52845	66728	23316				
OrthoPhosphate-P				20	9	3	4	1				
Phosphate-P				138	89	48	51	18				
Org. Carbon				41434	24077	14520	12631	4414				
Hardness CaCO3				343647	199880	82954	110200	38504				
Total Metals												
Aluminum Al				296	303	164	191	67				
Antimony Sb				4.0	4.3	5.5	1.3	0.5				
Arsenic As				3.8	2.0	0.7	1.0	0.3				
Barium Ba				22	15	6	8	3				
Beryllium Be				0.15	0.07	0.02	0.03	0.01				
Bismuth Bi				1.48	0.65	0.20	0.27	0.09				
Boron B				260	108	46	57	20				
Cadmium Cd				0.03	0.02	0.01	0.01	0.00				
Calcium Ca				80426	43345	16738	20949	7293				
Chromium Cr				5	1	1	1	0				
Cobalt Co				1.01	0.89	1.75	0.29	0.10				
Copper Cu				10	7	3	4	1				
Iron Fe				427	597	172	237	83				
Lead Pb				0.19	0.31	0.08	0.10	0.03				
Lithium Li				22	14	6	7	3				
Magnesium Mg				54929	30720	12930	16279	5690				
Manganese Mn				51	94	26	25	9				
Mercury Hg				0.01	0.01	0.00	0.00	0.00				
Molybdenum Mo				1.72	0.95	0.42	0.49	0.17				
Nickel Ni				3.64	2.88	0.97	1.19	0.41				
Phosphorus P				143	91	48	51	18				
Potassium K				23545	12376	5001	6295	2198				
Selenium Se				6.79	2.76	1.23	1.44	0.50				
Silicon SiO2				4228	2586	1054	1364	477				
Silver Ag				0.04	0.03	0.01	0.01	0.00				
Sodium Na				316192	164799	70012	84786	29625				
Strontium Sr				307	196	70	100	35				
Tellurium Te				375	233	97	125	44				
Thallium Tl				0.23	0.14	0.06	0.08	0.03				
Thorium Th				0.02	0.01	0.00	0.01	0.00				
Tin Sn				3.15	1.91	0.79	1.02	0.35				
Titanium Ti				48	30	12	16	6				
Uranium U				0.21	0.15	0.08	0.08	0.03				
Vanadium V				4.73	0.65	0.59	0.54	0.19				
Zinc Zn				8.80	15.18	5.66	4.53	1.60				
Zirconium Zr				38	23	10	13	4				

Table H 4-A-3
Scenario 4**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter												
TDS				1077724	578384	251335	367169	127672				
TSS				30126	27121	11708	17336	6041				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				2	1	0	0	0				
Sulphate				23170	13500	5928	7821	2710				
Chloride				485349	296589	121703	163564	56751				
Total Ammonia				36	36	26	31	11				
Nitrate				43	27	12	15	5				
Nitrite				14	9	4	5	2				
Alkalinity				206205	118487	53286	66658	23204				
OrthoPhosphate-P				12	6	3	3	1				
Phosphate-P				129	86	48	50	17				
Org. Carbon				41260	23998	14648	12659	4404				
Hardness CaCO3				339587	198207	83464	109951	38295				
Total Metals												
Aluminum Al				290	300	167	192	67				
Antimony Sb				3.2	4.0	5.5	1.2	0.4				
Arsenic As				3.6	1.9	0.7	0.9	0.3				
Barium Ba				21	14	6	8	3				
Beryllium Be				0.11	0.05	0.02	0.03	0.01				
Bismuth Bi				0.73	0.35	0.14	0.16	0.05				
Boron B				258	107	47	57	20				
Cadmium Cd				0.02	0.01	0.01	0.01	0.00				
Calcium Ca				69893	39089	16042	19545	6760				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.63	0.74	1.73	0.24	0.08				
Copper Cu				9	7	3	4	1				
Iron Fe				423	595	177	238	83				
Lead Pb				0.17	0.29	0.08	0.10	0.03				
Lithium Li				22	13	6	7	3				
Magnesium Mg				54498	30538	13043	16275	5667				
Manganese Mn				49	94	26	25	9				
Mercury Hg				0.01	0.01	0.00	0.00	0.00				
Molybdenum Mo				1.42	0.82	0.40	0.45	0.16				
Nickel Ni				3.30	2.75	0.96	1.15	0.40				
Phosphorus P				130	85	47	49	17				
Potassium K				22112	11793	4960	6123	2125				
Selenium Se				6.75	2.74	1.25	1.44	0.50				
Silicon SiO2				4050	2512	1069	1350	468				
Silver Ag				0.03	0.02	0.01	0.01	0.00				
Sodium Na				303449	159599	70045	83414	28977				
Strontium Sr				304	194	71	100	35				
Tellurium Te				374	232	98	125	44				
Thallium Tl				0.23	0.14	0.06	0.08	0.03				
Thorium Th				0.02	0.01	0.00	0.01	0.00				
Tin Sn				3.02	1.85	0.78	1.00	0.35				
Titanium Ti				47	30	13	16	6				
Uranium U				0.20	0.15	0.08	0.08	0.03				
Vanadium V				4.53	0.57	0.61	0.53	0.18				
Zinc Zn				7.88	14.81	5.64	4.42	1.55				
Zirconium Zr				37	23	10	13	4				

Table H 4-A-3
Scenario 4**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter												
TDS				1057111	569630	244399	362143	126531				
TSS				30164	27142	11597	17298	6044				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				1	0	0	0	0				
Sulphate				21892	12952	5615	7554	2639				
Chloride				471302	290620	116814	160071	55973				
Total Ammonia				36	36	26	31	11				
Nitrate				43	27	12	15	5				
Nitrite				14	9	4	5	2				
Alkalinity				205907	118378	52566	66350	23188				
OrthoPhosphate-P				8	5	2	2	1				
Phosphate-P				126	85	47	49	17				
Org. Carbon				41308	24025	14506	12611	4407				
Hardness CaCO3				338775	197880	82399	109451	38251				
Total Metals												
Aluminum Al				291	301	163	190	67				
Antimony Sb				2.9	3.8	5.4	1.2	0.4				
Arsenic As				3.6	1.9	0.7	0.9	0.3				
Barium Ba				21	14	6	8	3				
Beryllium Be				0.09	0.05	0.02	0.02	0.01				
Bismuth Bi				0.45	0.23	0.08	0.11	0.04				
Boron B				257	107	46	57	20				
Cadmium Cd				0.02	0.01	0.00	0.01	0.00				
Calcium Ca				66135	37479	15108	18752	6551				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.50	0.68	1.69	0.21	0.07				
Copper Cu				9	7	2	4	1				
Iron Fe				425	596	172	236	83				
Lead Pb				0.16	0.29	0.08	0.09	0.03				
Lithium Li				22	13	6	7	3				
Magnesium Mg				54461	30527	12876	16207	5666				
Manganese Mn				49	94	25	25	9				
Mercury Hg				0.01	0.01	0.00	0.00	0.00				
Molybdenum Mo				1.31	0.78	0.37	0.43	0.15				
Nickel Ni				3.19	2.70	0.92	1.12	0.39				
Phosphorus P				125	83	46	48	17				
Potassium K				21644	11595	4784	6002	2099				
Selenium Se				6.76	2.75	1.23	1.43	0.50				
Silicon SiO2				4008	2495	1029	1330	466				
Silver Ag				0.03	0.02	0.01	0.01	0.00				
Sodium Na				299614	157993	68122	82237	28765				
Strontium Sr				303	194	70	100	35				
Tellurium Te				374	233	97	125	44				
Thallium Tl				0.23	0.14	0.06	0.08	0.03				
Thorium Th				0.02	0.01	0.00	0.00	0.00				
Tin Sn				2.98	1.84	0.77	0.99	0.35				
Titanium Ti				47	30	12	16	6				
Uranium U				0.20	0.15	0.08	0.08	0.03				
Vanadium V				4.49	0.55	0.56	0.50	0.18				
Zinc Zn				7.60	14.69	5.52	4.34	1.54				
Zirconium Zr				37	23	10	13	4				

Table H 4-A-3
Scenario 4**Solute Loadings in D**
Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)

Date	Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16	Year 10 Jan-17
Parameter												
TDS				1044770	564500	245977	361383	125894				
TSS				30084	27103	11701	17328	6039				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				0	0	0	0	0				
Sulphate				21222	12679	5611	7479	2605				
Chloride				462747	287067	118027	159595	55532				
Total Ammonia				36	36	26	31	11				
Nitrate				43	27	12	15	5				
Nitrite				14	9	4	5	2				
Alkalinity				205220	118071	53125	66485	23151				
OrthoPhosphate-P				7	4	2	2	1				
Phosphate-P				125	84	47	49	17				
Org. Carbon				41209	23977	14640	12650	4401				
Hardness CaCO3				337631	197382	83145	109607	38190				
Total Metals												
Aluminum Al				287	299	167	191	67				
Antimony Sb				2.8	3.8	5.4	1.1	0.4				
Arsenic As				3.5	1.9	0.7	0.9	0.3				
Barium Ba				21	14	6	8	3				
Beryllium Be				0.08	0.05	0.02	0.02	0.01				
Bismuth Bi				0.32	0.18	0.07	0.09	0.03				
Boron B				257	106	46	57	20				
Cadmium Cd				0.02	0.01	0.00	0.01	0.00				
Calcium Ca				64154	36672	15109	18537	6450				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.43	0.65	1.69	0.21	0.07				
Copper Cu				9	7	3	4	1				
Iron Fe				422	595	177	238	83				
Lead Pb				0.15	0.29	0.08	0.09	0.03				
Lithium Li				21	13	6	7	3				
Magnesium Mg				54310	30459	13012	16242	5657				
Manganese Mn				49	94	25	25	9				
Mercury Hg				0.01	0.01	0.00	0.00	0.00				
Molybdenum Mo				1.25	0.75	0.37	0.42	0.15				
Nickel Ni				3.12	2.67	0.93	1.12	0.39				
Phosphorus P				122	82	46	48	17				
Potassium K				21348	11472	4836	5989	2084				
Selenium Se				6.74	2.74	1.25	1.44	0.50				
Silicon SiO2				3962	2475	1055	1335	464				
Silver Ag				0.03	0.02	0.01	0.01	0.00				
Sodium Na				296793	156793	68961	82244	28618				
Strontium Sr				302	194	70	100	35				
Tellurium Te				373	232	98	125	44				
Thallium Tl				0.22	0.14	0.06	0.08	0.03				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				2.95	1.83	0.77	0.99	0.34				
Titanium Ti				47	30	13	16	6				
Uranium U				0.20	0.15	0.08	0.08	0.03				
Vanadium V				4.44	0.53	0.60	0.51	0.17				
Zinc Zn				7.40	14.61	5.56	4.34	1.53				
Zirconium Zr				37	23	10	13	4				

Table H-4-A-1
Scenario 4

OUTPUT SUMMARY							Fraction of CCME in Doris Creek (%)	
Discharge rate		1300000 m3/year						
Degradation Field(age)		Tail Lk Cu < CME Year		7				
		MMER	CCME	Tail Lake Year 2	Doris Creek Year 3	L'Roberts L Year 3	Creek (%)	
Maximum Concentration								
pH			6 to 9	7 to 8	7 to 8	7 to 8	4%	
TDS		mg/L		1377	227	202		
TSS		mg/L		3.8	7.0	8.1		
Free CN		mg/L	0.005	0.0025	0.00018	0.00010		
Total CN		mg/L	1.0	0.025	0.004	0.003		
WAD CN		mg/L		0.0034	0.0002	0.0001		
CNO		mg/L		2.8	0.20	0.11		
SCN		mg/L		0.099	0.007	0.004		
Sulphate		mg/L		92	9.1	7.4		
Chloride		mg/L		947	123	96		
Total Ammonia		mg/L	0.97	0.94	0.078	0.042		8%
Nitrate		mg/L	2.9	5.7	0.42	0.22		14%
Nitrite		mg/L	0.018	0.39	0.031	0.017		169%
Alkalinity		mg/L		56	29	27		
OrthoPhosphate-P		mg/L		0.1892	0.0141	0.0080		
Phosphate-P		mg/L		0.1953	0.0325	0.0313		
Org. Carbon		mg/L		4.7	7.5	7.2		
Hardness CaCO3		mg/L		109	50	47		
Total Metals								
Aluminum Al		mg/L	0.1	0.13	0.08	0.25	85%	
Antimony Sb		mg/L		0.0171	0.0035	0.0022	13%	
Arsenic As		mg/L	0.5	0.00	0.0006	0.0006		
Barium Ba		mg/L		0.0106	0.0035	0.0055		
Beryllium Be		mg/L		0.00064	0.00005	0.00003		
Bismuth Bi		mg/L		0.01654	0.00120	0.00072	18%	
Boron B		mg/L		0.036	0.035	0.031		
Cadmium Cd		mg/L	0.000038	0.000056	0.0000070	0.0000166		
Calcium Ca		mg/L		248	25	17		
Chromium Cr		mg/L	0.001	0.0066	0.001	0.001	106%	
Cobalt Co		mg/L		0.0103	0.0014	0.0007	98%	
Copper Cu		mg/L	0.3	0.009	0.0020	0.0021		
Iron Fe		mg/L	0.3	0.14	0.13	0.28		
Lead Pb		mg/L	0.2	0.00041	0.00008	0.00027		
Lithium Li		mg/L		0.0054	0.0030	0.0030	4%	
Magnesium Mg		mg/L		9.3	7.4	7.4	1%	
Manganese Mn		mg/L		0.028	0.021	0.025		
Mercury Hg		mg/L	0.0001	0.0000107	0.0000014	0.0000010		
Molybdenum Mo		mg/L	0.073	0.0090	0.00077	0.00051		
Nickel Ni		mg/L	0.5	0.008	0.0010	0.0009	4%	
Phosphorus P		mg/L		0.271	0.037	0.034	90%	
Potassium K		mg/L		41	5.5	4.2		
Selenium Se		mg/L	0.001	0.00081	0.00090	0.00085		
Silicon SiO2		mg/L		4.0	0.75	0.65		
Silver Ag		mg/L	0.0001	0.00012	0.0000103	0.0000082	10%	
Sodium Na		mg/L		293	57	48	4%	
Strontium Sr		mg/L		0.089	0.044	0.048		
Tellurium Te		mg/L		0.039	0.050	0.051		
Thallium Tl		mg/L	0.0008	0.000042	0.000031	0.002002		
Thorium Th		mg/L		0.000053	0.0000054	0.0000028	14%	
Tin Sn		mg/L		0.00262	0.00056	0.00010		
Titanium Ti		mg/L		0.0104	0.0063	0.0064		
Uranium U		mg/L		0.000080	0.000042	0.000046		
Vanadium V		mg/L		0.0039	0.0008	0.0006	14%	
Zinc Zn		mg/L	0.5	0.023	0.0043	0.0058		
Zirconium Zr		mg/L		0.0045	0.0050	0.0052		

Table H-1-C-2
Scenario 4

Water Quality in Little Roberst Lake Outflow

Date		Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter													
TDS	mg/L				150	150	140	160	160				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				3.8	3.7	4.7	4.5	4.5				
Chloride	mg/L				61	58	57	65	65				
Total Ammonia	mg/L				0.007	0.007	0.002	0.009	0.009				
Nitrate	mg/L				0.02	0.02	0.01	0.02	0.02				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0010	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0160	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00000	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00010	0.00010	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000028	0.0000044	0.0000149	0.0000024	0.0000024				
Calcium Ca	mg/L				8	7	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00016	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0005	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.2	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000038	0.0000010	0.0000034	0.0000018	0.0000018				
Sodium Na	mg/L				37	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00000	0.00000	0.00000	0.00000	0.00000				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-1-C-2
Scenario 4

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter													
TDS	mg/L				165	164	154	176	177				
TSS	mg/L				7.1	8.1	4.1	5.1	5.1				
Free CN	mg/L				0.00010		0.00001	0.00001	0.00001				
Total CN	mg/L				0.003	0.002	0.002	0.002	0.002				
WAD CN	mg/L				0.0001		0.0000	0.0000	0.0000				
CNO	mg/L				0.11		0.01	0.01	0.01				
SCN	mg/L				0.003	0.002	0.002	0.003	0.003				
Sulphate	mg/L				6.2	5.9	7.0	7.1	7.2				
Chloride	mg/L				70	66	66	75	75				
Total Ammonia	mg/L				0.024	0.042	0.002	0.016	0.016				
Nitrate	mg/L				0.15	0.16	0.16	0.20	0.21				
Nitrite	mg/L				0.017	0.007	0.007	0.004	0.010				
Alkalinity	mg/L				25	24	26	27	27				
OrthoPhosphate-P	mg/L				0.0045	0.0041	0.0042	0.0046	0.0048				
Phosphate-P	mg/L				0.0276	0.0192	0.0103	0.0227	0.0229				
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1				
Hardness CaCO3	mg/L				46	41	43	47	47				
Total Metals													
Aluminum Al	mg/L				0.24	0.12	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0007	0.0020	0.0015	0.0010	0.0010				
Arsenic As	mg/L				0.0005	0.0004	0.0006	0.0005	0.0005				
Barium Ba	mg/L				0.0054	0.0037	0.0047	0.0045	0.0045				
Beryllium Be	mg/L				0.00002	0.00002	0.00002	0.00002	0.00002				
Bismuth Bi	mg/L				0.00039	0.00039	0.00041	0.00045	0.00047				
Boron B	mg/L				0.030	0.021	0.029	0.027	0.027				
Cadmium Cd	mg/L				0.0000043	0.0000057	0.0000164	0.0000040	0.0000041				
Calcium Ca	mg/L				14	13	13	14	15				
Chromium Cr	mg/L				0.001	0.000	0.001	0.001	0.001				
Cobalt Co	mg/L				0.0004	0.0006	0.0006	0.0004	0.0004				
Copper Cu	mg/L				0.0014	0.0015	0.0018	0.0021	0.0021				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00008	0.00006	0.00010	0.00026	0.00027				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0030	0.0030				
Magnesium Mg	mg/L				7.2	5.2	5.4	7.4	7.4				
Manganese Mn	mg/L				0.024	0.009	0.013	0.009	0.009				
Mercury Hg	mg/L				0.0000008	0.0000008	0.0000008	0.0000008	0.0000008				
Molybdenum Mo	mg/L				0.00042	0.00038	0.00046	0.00045	0.00046				
Nickel Ni	mg/L				0.0009	0.0007	0.0008	0.0008	0.0008				
Phosphorus P	mg/L				0.030	0.022	0.013	0.025	0.026				
Potassium K	mg/L				3.8	3.2	3.2	3.6	3.7				
Selenium Se	mg/L				0.00066	0.00038	0.00084	0.00061	0.00061				
Silicon SiO2	mg/L				0.61	0.60	0.61	0.62	0.63				
Silver Ag	mg/L				0.0000069	0.0000043	0.0000069	0.0000055	0.0000056				
Sodium Na	mg/L				39	32	35	37	37				
Strontium Sr	mg/L				0.047	0.039	0.041	0.048	0.048				
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051				
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002002	0.002002				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000002	0.000002				
Tin Sn	mg/L				0.00005	0.00005	0.00005	0.00006	0.00006				
Titanium Ti	mg/L				0.0061	0.0061	0.0061	0.0062	0.0062				
Uranium U	mg/L				0.000037	0.000034	0.000036	0.000045	0.000045				
Vanadium V	mg/L				0.0005	0.0002	0.0005	0.0004	0.0004				
Zinc Zn	mg/L				0.0041	0.0022	0.0021	0.0058	0.0058				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-1-C-2
Scenario 4

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

		Year 3	Year 3	Year 3	Year 3	Year 3	Year 3	Year 3	Year 3	Year 3	Year 3	Year 3	
Date		Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10
Parameter													
TDS	mg/L				172	174	169	196	202				
TSS	mg/L				7.1	8.1	4.1	5.1	5.1				
Free CN	mg/L				0.00007								
Total CN	mg/L				0.003	0.002	0.002	0.002	0.002				
WAD CN	mg/L				0.0001								
CNO	mg/L				0.07								
SCN	mg/L				0.004	0.003	0.003	0.003	0.003				
Sulphate	mg/L				7.2	6.5	7.4	7.3	7.3				
Chloride	mg/L				75	74	76	89	93				
Total Ammonia	mg/L				0.021	0.031	0.002	0.009	0.010				
Nitrate	mg/L				0.22	0.20	0.20	0.22	0.22				
Nitrite	mg/L				0.017	0.006	0.007	0.003	0.003				
Alkalinity	mg/L				25	25	26	27	27				
OrthoPhosphate-P	mg/L				0.0065	0.0057	0.0058	0.0063	0.0065				
Phosphate-P	mg/L				0.0296	0.0209	0.0120	0.0245	0.0247				
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1				
Hardness CaCO3	mg/L				47	41	43	47	47				
Total Metals													
Aluminum Al	mg/L				0.25	0.12	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0009	0.0022	0.0016	0.0011	0.0012				
Arsenic As	mg/L				0.0005	0.0004	0.0006	0.0005	0.0005				
Barium Ba	mg/L				0.0055	0.0037	0.0047	0.0045	0.0045				
Beryllium Be	mg/L				0.00003	0.00002	0.00003	0.00003	0.00003				
Bismuth Bi	mg/L				0.00056	0.00053	0.00056	0.00060	0.00063				
Boron B	mg/L				0.030	0.021	0.029	0.027	0.027				
Cadmium Cd	mg/L				0.0000049	0.0000061	0.0000166	0.0000042	0.0000042				
Calcium Ca	mg/L				17	14	14	16	16				
Chromium Cr	mg/L				0.001	0.000	0.001	0.001	0.001				
Cobalt Co	mg/L				0.0005	0.0006	0.0007	0.0004	0.0004				
Copper Cu	mg/L				0.0015	0.0016	0.0019	0.0021	0.0021				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00008	0.00006	0.00010	0.00027	0.00027				
Lithium Li	mg/L				0.0030	0.0030	0.0030	0.0030	0.0030				
Magnesium Mg	mg/L				7.3	5.3	5.5	7.4	7.4				
Manganese Mn	mg/L				0.025	0.009	0.013	0.009	0.009				
Mercury Hg	mg/L				0.0000008	0.0000009	0.0000009	0.0000009	0.0000009				
Molybdenum Mo	mg/L				0.00051	0.00043	0.00049	0.00046	0.00046				
Nickel Ni	mg/L				0.0009	0.0008	0.0009	0.0008	0.0008				
Phosphorus P	mg/L				0.033	0.024	0.015	0.027	0.028				
Potassium K	mg/L				4.2	3.4	3.3	3.7	3.7				
Selenium Se	mg/L				0.00066	0.00039	0.00084	0.00062	0.00062				
Silicon SiO2	mg/L				0.65	0.63	0.63	0.63	0.63				
Silver Ag	mg/L				0.0000077	0.0000049	0.0000075	0.0000061	0.0000061				
Sodium Na	mg/L				39	34	38	43	45				
Strontium Sr	mg/L				0.047	0.040	0.042	0.048	0.048				
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051				
Thallium Tl	mg/L				0.000102	0.000302	0.000302	0.002002	0.002002				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00007	0.00007	0.00007	0.00008	0.00009				
Titanium Ti	mg/L				0.0062	0.0062	0.0062	0.0062	0.0063				
Uranium U	mg/L				0.000038	0.000034	0.000037	0.000045	0.000045				
Vanadium V	mg/L				0.0005	0.0002	0.0006	0.0004	0.0004				
Zinc Zn	mg/L				0.0043	0.0024	0.0022	0.0058	0.0058				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0052				

Table H-1-C-2
Scenario 4

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter													
TDS	mg/L				201	190	178	200	199				
TSS	mg/L				7.1	8.1	4.1	5.1	5.1				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.003	0.002	0.002	0.002	0.002				
Sulphate	mg/L				6.7	5.9	6.8	6.7	6.6				
Chloride	mg/L				96	85	83	92	92				
Total Ammonia	mg/L				0.009	0.007	0.002	0.009	0.009				
Nitrate	mg/L				0.20	0.17	0.16	0.18	0.18				
Nitrite	mg/L				0.007	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				25	24	26	27	27				
OrthoPhosphate-P	mg/L				0.0080	0.0064	0.0061	0.0064	0.0062				
Phosphate-P	mg/L				0.0313	0.0217	0.0124	0.0247	0.0245				
Org. Carbon	mg/L				6.1	4.1	7.2	5.2	5.2				
Hardness CaCO3	mg/L				46	41	43	47	47				
Total Metals													
Aluminum Al	mg/L				0.25	0.12	0.20	0.16	0.16				
Antimony Sb	mg/L				0.0011	0.0022	0.0016	0.0011	0.0011				
Arsenic As	mg/L				0.0005	0.0004	0.0006	0.0005	0.0005				
Barium Ba	mg/L				0.0054	0.0037	0.0047	0.0044	0.0044				
Beryllium Be	mg/L				0.00003	0.00002	0.00003	0.00003	0.00003				
Bismuth Bi	mg/L				0.00072	0.00057	0.00055	0.00057	0.00056				
Boron B	mg/L				0.031	0.021	0.029	0.028	0.028				
Cadmium Cd	mg/L				0.0000046	0.0000059	0.0000164	0.0000040	0.0000040				
Calcium Ca	mg/L				16	13	13	14	14				
Chromium Cr	mg/L				0.001	0.000	0.001	0.001	0.001				
Cobalt Co	mg/L				0.0005	0.0005	0.0006	0.0003	0.0003				
Copper Cu	mg/L				0.0014	0.0015	0.0018	0.0021	0.0021				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00008	0.00006	0.00010	0.00027	0.00027				
Lithium Li	mg/L				0.0030	0.0030	0.0030	0.0030	0.0030				
Magnesium Mg	mg/L				7.3	5.3	5.5	7.4	7.4				
Manganese Mn	mg/L				0.025	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000009	0.0000009	0.0000010	0.0000010	0.0000010				
Molybdenum Mo	mg/L				0.00044	0.00036	0.00042	0.00039	0.00039				
Nickel Ni	mg/L				0.0009	0.0007	0.0008	0.0008	0.0008				
Phosphorus P	mg/L				0.034	0.024	0.015	0.027	0.027				
Potassium K	mg/L				3.9	3.1	3.0	3.4	3.4				
Selenium Se	mg/L				0.00066	0.00039	0.00085	0.00062	0.00062				
Silicon SiO2	mg/L				0.63	0.61	0.61	0.61	0.61				
Silver Ag	mg/L				0.0000082	0.0000051	0.0000077	0.0000063	0.0000062				
Sodium Na	mg/L				48	39	42	44	44				
Strontium Sr	mg/L				0.047	0.039	0.041	0.048	0.048				
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051				
Thallium Tl	mg/L				0.000102	0.000302	0.000302	0.002002	0.002002				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000003	0.000003				
Tin Sn	mg/L				0.00010	0.00008	0.00007	0.00008	0.00008				
Titanium Ti	mg/L				0.0063	0.0063	0.0063	0.0063	0.0063				
Uranium U	mg/L				0.000038	0.000034	0.000037	0.000046	0.000046				
Vanadium V	mg/L				0.0006	0.0002	0.0006	0.0004	0.0004				
Zinc Zn	mg/L				0.0042	0.0022	0.0021	0.0057	0.0057				
Zirconium Zr	mg/L				0.0052	0.0051	0.0052	0.0052	0.0052				

Table H-1-C-2
Scenario 4

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter													
TDS	mg/L				189	177	165	181	179				
TSS	mg/L				7.1	8.1	4.1	5.1	5.1				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.002	0.001	0.001	0.001	0.001				
Sulphate	mg/L				6.0	5.2	6.0	5.6	5.5				
Chloride	mg/L				88	77	75	80	78				
Total Ammonia	mg/L				0.007	0.008	0.002	0.009	0.009				
Nitrate	mg/L				0.15	0.12	0.11	0.10	0.10				
Nitrite	mg/L				0.002	0.003	0.001	0.002	0.002				
Alkalinity	mg/L				25	24	25	26	26				
OrthoPhosphate-P	mg/L				0.0062	0.0045	0.0042	0.0037	0.0034				
Phosphate-P	mg/L				0.0296	0.0199	0.0107	0.0221	0.0217				
Org. Carbon	mg/L				6.2	4.2	7.2	5.2	5.1				
Hardness CaCO3	mg/L				46	40	42	46	46				
Total Metals													
Aluminum Al	mg/L				0.25	0.12	0.20	0.16	0.16				
Antimony Sb	mg/L				0.0009	0.0020	0.0015	0.0009	0.0008				
Arsenic As	mg/L				0.0005	0.0004	0.0006	0.0005	0.0005				
Barium Ba	mg/L				0.0053	0.0036	0.0046	0.0043	0.0043				
Beryllium Be	mg/L				0.00003	0.00002	0.00002	0.00002	0.00002				
Bismuth Bi	mg/L				0.00056	0.00041	0.00038	0.00034	0.00031				
Boron B	mg/L				0.031	0.021	0.029	0.027	0.027				
Cadmium Cd	mg/L				0.0000045	0.0000056	0.0000162	0.0000035	0.0000034				
Calcium Ca	mg/L				14	11	11	11	11				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0004	0.0005	0.0005	0.0002	0.0002				
Copper Cu	mg/L				0.0014	0.0015	0.0018	0.0020	0.0020				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00008	0.00006	0.00010	0.00026	0.00026				
Lithium Li	mg/L				0.0030	0.0030	0.0030	0.0029	0.0029				
Magnesium Mg	mg/L				7.3	5.3	5.5	7.3	7.3				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000010	0.0000010	0.0000010	0.0000010	0.0000010				
Molybdenum Mo	mg/L				0.00037	0.00030	0.00036	0.00030	0.00029				
Nickel Ni	mg/L				0.0008	0.0006	0.0008	0.0007	0.0007				
Phosphorus P	mg/L				0.032	0.022	0.012	0.023	0.023				
Potassium K	mg/L				3.6	2.8	2.8	3.0	2.9				
Selenium Se	mg/L				0.00067	0.00039	0.00085	0.00062	0.00062				
Silicon SiO2	mg/L				0.61	0.59	0.59	0.58	0.57				
Silver Ag	mg/L				0.0000082	0.0000050	0.0000076	0.0000054	0.0000050				
Sodium Na	mg/L				46	37	39	41	40				
Strontium Sr	mg/L				0.047	0.039	0.041	0.047	0.047				
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051				
Thallium Tl	mg/L				0.000102	0.000301	0.000302	0.002001	0.002001				
Thorium Th	mg/L				0.000003	0.000003	0.000003	0.000003	0.000003				
Tin Sn	mg/L				0.00008	0.00005	0.00005	0.00004	0.00004				
Titanium Ti	mg/L				0.0064	0.0064	0.0064	0.0063	0.0063				
Uranium U	mg/L				0.000039	0.000035	0.000038	0.000046	0.000045				
Vanadium V	mg/L				0.0006	0.0002	0.0006	0.0004	0.0004				
Zinc Zn	mg/L				0.0040	0.0021	0.0019	0.0054	0.0054				
Zirconium Zr	mg/L				0.0052	0.0052	0.0052	0.0052	0.0052				

Table H-1-C-2
Scenario 4

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter													
TDS	mg/L				167	163	152	170	169				
TSS	mg/L				7.1	8.1	4.1	5.1	5.1				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.001	0.001	0.001	0.000	0.000				
Sulphate	mg/L				4.7	4.3	5.3	5.0	4.9				
Chloride	mg/L				73	67	65	72	71				
Total Ammonia	mg/L				0.005	0.006	0.001	0.007	0.007				
Nitrate	mg/L				0.05	0.05	0.04	0.05	0.04				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				24	24	25	26	26				
OrthoPhosphate-P	mg/L				0.0032	0.0025	0.0024	0.0022	0.0020				
Phosphate-P	mg/L				0.0265	0.0178	0.0088	0.0205	0.0203				
Org. Carbon	mg/L				6.1	4.1	7.2	5.1	5.1				
Hardness CaCO3	mg/L				45	39	41	45	45				
Total Metals													
Aluminum Al	mg/L				0.25	0.12	0.20	0.16	0.15				
Antimony Sb	mg/L				0.0006	0.0018	0.0013	0.0007	0.0007				
Arsenic As	mg/L				0.0005	0.0004	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0052	0.0035	0.0045	0.0042	0.0042				
Beryllium Be	mg/L				0.00002	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00029	0.00023	0.00022	0.00020	0.00019				
Boron B	mg/L				0.030	0.021	0.029	0.027	0.027				
Cadmium Cd	mg/L				0.0000034	0.0000048	0.0000154	0.0000028	0.0000027				
Calcium Ca	mg/L				10	9	8	9	9				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0004	0.0004	0.0002	0.0002				
Copper Cu	mg/L				0.0013	0.0014	0.0017	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00026	0.00026				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.2	5.2	5.4	7.3	7.3				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000009	0.0000009	0.0000010	0.0000009	0.0000009				
Molybdenum Mo	mg/L				0.00026	0.00022	0.00029	0.00024	0.00024				
Nickel Ni	mg/L				0.0007	0.0006	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.027	0.018	0.009	0.021	0.021				
Potassium K	mg/L				3.1	2.5	2.5	2.7	2.7				
Selenium Se	mg/L				0.00066	0.00039	0.00085	0.00062	0.00061				
Silicon SiO2	mg/L				0.56	0.55	0.55	0.55	0.54				
Silver Ag	mg/L				0.0000061	0.0000034	0.0000061	0.0000040	0.0000038				
Sodium Na	mg/L				41	34	36	39	38				
Strontium Sr	mg/L				0.045	0.038	0.040	0.046	0.046				
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051				
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00003	0.00002	0.00002	0.00002	0.00002				
Titanium Ti	mg/L				0.0063	0.0063	0.0064	0.0063	0.0063				
Uranium U	mg/L				0.000037	0.000034	0.000036	0.000044	0.000044				
Vanadium V	mg/L				0.0005	0.0002	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0037	0.0019	0.0017	0.0053	0.0053				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-1-C-2
Scenario 4

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter													
TDS	mg/L				159	157	145	165	165				
TSS	mg/L				7.1	8.1	4.1	5.1	5.1				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.000	0.000	0.000	0.000	0.000				
Sulphate	mg/L				4.2	4.0	4.9	4.7	4.7				
Chloride	mg/L				67	63	60	69	69				
Total Ammonia	mg/L				0.005	0.005	0.000	0.007	0.007				
Nitrate	mg/L				0.02	0.01	0.00	0.01	0.01				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				24	24	25	26	26				
OrthoPhosphate-P	mg/L				0.0020	0.0017	0.0014	0.0015	0.0015				
Phosphate-P	mg/L				0.0253	0.0170	0.0077	0.0198	0.0198				
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1				
Hardness CaCO3	mg/L				44	39	41	45	45				
Total Metals													
Aluminum Al	mg/L				0.25	0.12	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0005	0.0018	0.0012	0.0007	0.0007				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0052	0.0035	0.0045	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00019	0.00016	0.00014	0.00014	0.00014				
Boron B	mg/L				0.030	0.021	0.029	0.027	0.027				
Cadmium Cd	mg/L				0.0000031	0.0000045	0.0000149	0.0000024	0.0000024				
Calcium Ca	mg/L				9	8	7	8	8				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0014	0.0016	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.1	5.2	5.3	7.2	7.2				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000009	0.0000009	0.0000008	0.0000009	0.0000009				
Molybdenum Mo	mg/L				0.00022	0.00019	0.00026	0.00022	0.00022				
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.026	0.017	0.008	0.020	0.020				
Potassium K	mg/L				2.9	2.3	2.3	2.6	2.6				
Selenium Se	mg/L				0.00066	0.00039	0.00084	0.00061	0.00061				
Silicon SiO2	mg/L				0.54	0.54	0.53	0.53	0.53				
Silver Ag	mg/L				0.0000057	0.0000030	0.0000049	0.0000033	0.0000033				
Sodium Na	mg/L				40	33	35	38	38				
Strontium Sr	mg/L				0.045	0.038	0.040	0.046	0.046				
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051				
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001				
Thorium Th	mg/L				0.000002	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00002	0.00001	0.00001	0.00001	0.00001				
Titanium Ti	mg/L				0.0063	0.0063	0.0063	0.0063	0.0063				
Uranium U	mg/L				0.000037	0.000033	0.000035	0.000044	0.000044				
Vanadium V	mg/L				0.0005	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0036	0.0018	0.0016	0.0052	0.0052				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-1-C-2
Scenario 4

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter													
TDS	mg/L				155	154	144	164	163				
TSS	mg/L				7.1	8.1	4.1	5.1	5.1				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.000	0.000	0.000	0.000	0.000				
Sulphate	mg/L				4.0	3.8	4.8	4.6	4.6				
Chloride	mg/L				64	61	60	68	67				
Total Ammonia	mg/L				0.005	0.005	0.000	0.007	0.007				
Nitrate	mg/L				0.01	0.01	0.00	0.01	0.01				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				24	24	25	26	26				
OrthoPhosphate-P	mg/L				0.0014	0.0013	0.0013	0.0012	0.0012				
Phosphate-P	mg/L				0.0247	0.0167	0.0077	0.0196	0.0195				
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1				
Hardness CaCO3	mg/L				44	39	41	45	45				
Total Metals													
Aluminum Al	mg/L				0.25	0.12	0.20	0.15	0.15				
Antimony Sb	mg/L				0.0005	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0045	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00013	0.00012	0.00012	0.00012	0.00012				
Boron B	mg/L				0.030	0.021	0.029	0.027	0.027				
Cadmium Cd	mg/L				0.0000028	0.0000043	0.0000148	0.0000023	0.0000023				
Calcium Ca	mg/L				8	7	7	8	8				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.1	5.1	5.3	7.2	7.2				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000009	0.0000009	0.0000009	0.0000009	0.0000009				
Molybdenum Mo	mg/L				0.00020	0.00018	0.00025	0.00021	0.00021				
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.025	0.017	0.008	0.019	0.019				
Potassium K	mg/L				2.8	2.3	2.3	2.6	2.6				
Selenium Se	mg/L				0.00066	0.00039	0.00085	0.00061	0.00061				
Silicon SiO2	mg/L				0.53	0.53	0.53	0.53	0.53				
Silver Ag	mg/L				0.0000050	0.0000026	0.0000052	0.0000032	0.0000030				
Sodium Na	mg/L				39	32	35	37	37				
Strontium Sr	mg/L				0.045	0.038	0.040	0.046	0.046				
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051				
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Titanium Ti	mg/L				0.0063	0.0063	0.0063	0.0063	0.0063				
Uranium U	mg/L				0.000037	0.000033	0.000036	0.000044	0.000044				
Vanadium V	mg/L				0.0005	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0036	0.0017	0.0016	0.0052	0.0052				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-1-C-2
Scenario 4

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter													
TDS	mg/L				153	153	142	163	163				
TSS	mg/L				7.1	8.1	4.1	5.1	5.1				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.000	0.000	0.000	0.000	0.000				
Sulphate	mg/L				3.9	3.8	4.7	4.5	4.5				
Chloride	mg/L				63	60	59	67	67				
Total Ammonia	mg/L				0.005	0.005	0.000	0.007	0.007				
Nitrate	mg/L				0.01	0.01	0.00	0.01	0.01				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				24	24	24	26	26				
OrthoPhosphate-P	mg/L				0.0012	0.0012	0.0011	0.0011	0.0011				
Phosphate-P	mg/L				0.0245	0.0165	0.0074	0.0194	0.0194				
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1				
Hardness CaCO3	mg/L				44	39	41	45	45				
Total Metals													
Aluminum Al	mg/L				0.25	0.12	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00012	0.00011	0.00011	0.00011	0.00011				
Boron B	mg/L				0.030	0.021	0.029	0.027	0.027				
Cadmium Cd	mg/L				0.0000027	0.0000042	0.0000147	0.0000022	0.0000022				
Calcium Ca	mg/L				8	7	7	8	8				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.1	5.1	5.3	7.2	7.2				
Manganese Mn	mg/L				0.024	0.009	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000009	0.0000009	0.0000008	0.0000009	0.0000009				
Molybdenum Mo	mg/L				0.00019	0.00017	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0007	0.0005	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L				2.8	2.3	2.2	2.5	2.5				
Selenium Se	mg/L				0.00066	0.00039	0.00084	0.00061	0.00061				
Silicon SiO2	mg/L				0.53	0.53	0.52	0.53	0.53				
Silver Ag	mg/L				0.0000049	0.0000025	0.0000045	0.0000030	0.0000029				
Sodium Na	mg/L				39	32	34	37	37				
Strontium Sr	mg/L				0.045	0.038	0.040	0.046	0.046				
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051				
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00001	0.00001	0.00000	0.00001	0.00001				
Titanium Ti	mg/L				0.0063	0.0063	0.0063	0.0063	0.0063				
Uranium U	mg/L				0.000037	0.000033	0.000035	0.000044	0.000044				
Vanadium V	mg/L				0.0005	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0016	0.0052	0.0052				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-1-C-2
Scenario 4

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16
Parameter												
TDS	mg/L				153	153	143	163	162			
TSS	mg/L				7.1	8.1	4.1	5.1	5.1			
Free CN	mg/L											
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002			
WAD CN	mg/L											
CNO	mg/L											
SCN	mg/L				0.000	0.000	0.000	0.000	0.000			
Sulphate	mg/L				3.8	3.7	4.7	4.5	4.5			
Chloride	mg/L				63	60	59	67	67			
Total Ammonia	mg/L				0.005	0.005	0.000	0.007	0.007			
Nitrate	mg/L				0.01	0.01	0.00	0.01	0.01			
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002			
Alkalinity	mg/L				24	24	25	26	26			
OrthoPhosphate-P	mg/L				0.0011	0.0011	0.0011	0.0011	0.0011			
Phosphate-P	mg/L				0.0244	0.0164	0.0075	0.0194	0.0194			
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1			
Hardness CaCO3	mg/L				44	39	41	45	45			
Total Metals												
Aluminum Al	mg/L				0.25	0.12	0.20	0.15	0.15			
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006			
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004			
Barium Ba	mg/L				0.0051	0.0034	0.0045	0.0042	0.0042			
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001			
Bismuth Bi	mg/L				0.00011	0.00010	0.00010	0.00010	0.00010			
Boron B	mg/L				0.030	0.021	0.029	0.027	0.027			
Cadmium Cd	mg/L				0.0000026	0.0000042	0.0000147	0.0000022	0.0000022			
Calcium Ca	mg/L				8	7	7	8	8			
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000			
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001			
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0019	0.0019			
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16			
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025			
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029			
Magnesium Mg	mg/L				7.1	5.1	5.3	7.2	7.2			
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008			
Mercury Hg	mg/L				0.0000008	0.0000009	0.0000009	0.0000009	0.0000009			
Molybdenum Mo	mg/L				0.00019	0.00017	0.00024	0.00020	0.00020			
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006			
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019			
Potassium K	mg/L				2.8	2.2	2.2	2.5	2.5			
Selenium Se	mg/L				0.00066	0.00039	0.00084	0.00061	0.00061			
Silicon SiO2	mg/L				0.52	0.53	0.53	0.53	0.53			
Silver Ag	mg/L				0.0000047	0.0000024	0.0000050	0.0000031	0.0000029			
Sodium Na	mg/L				38	32	35	37	37			
Strontium Sr	mg/L				0.045	0.038	0.040	0.046	0.046			
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051			
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001			
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001			
Tin Sn	mg/L				0.00001	0.00000	0.00001	0.00000	0.00000			
Titanium Ti	mg/L				0.0063	0.0063	0.0063	0.0063	0.0063			
Uranium U	mg/L				0.000036	0.000033	0.000035	0.000044	0.000043			
Vanadium V	mg/L				0.0005	0.0001	0.0005	0.0003	0.0003			
Zinc Zn	mg/L				0.0035	0.0017	0.0016	0.0052	0.0052			
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051			

Table H 4-A-3
Scenario 4

Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter												
TDS				140	121	125	145	145				
TSS				4.0	5.9	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN												
Sulphate				2.8	2.7	2.9	3.0	3.0				
Chloride				61	61	59	63	63				
Total Ammonia				0.008	0.011	0.017	0.016	0.016				
Nitrate				0.03	0.03	0.03	0.03	0.03				
Nitrite				0.003	0.003	0.003	0.003	0.003				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca				9	8	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.018	0.024	0.020	0.020				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.51	0.51	0.51	0.51	0.51				
Silver Ag				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000017	0.0000017	0.0000017	0.0000017	0.0000017				
Tin Sn				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 4-A-3
Scenario 4

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter												
TDS				159	139	143	165	166				
TSS				3.9	5.6	5.7	6.7	6.7				
Free CN				0.00018		0.00002	0.00003	0.00003				
Total CN				0.004	0.002	0.002	0.002	0.002				
WAD CN				0.0002		0.0000	0.0000	0.0000				
CNO				0.20		0.03	0.03	0.03				
SCN				0.005	0.005	0.005	0.005	0.006				
Sulphate				7.3	6.7	7.1	7.7	8.0				
Chloride				74	72	71	77	78				
Total Ammonia				0.041	0.078	0.016	0.030	0.029				
Nitrate				0.29	0.30	0.32	0.37	0.39				
Nitrite				0.031	0.011	0.015	0.005	0.016				
Alkalinity				29	26	28	28	28				
OrthoPhosphate-P				0.0074	0.0066	0.0068	0.0075	0.0079				
Phosphate-P				0.0222	0.0227	0.0286	0.0252	0.0256				
Org. Carbon				5.3	5.0	7.2	4.9	4.9				
Hardness CaCO3				48	45	45	47	47				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0009	0.0013	0.0033	0.0011	0.0012				
Arsenic As				0.0006	0.0005	0.0005	0.0005	0.0005				
Barium Ba				0.0032	0.0034	0.0033	0.0035	0.0035				
Beryllium Be				0.00004	0.00003	0.00004	0.00004	0.00004				
Bismuth Bi				0.00057	0.00057	0.00062	0.00069	0.00074				
Boron B				0.034	0.022	0.023	0.023	0.023				
Cadmium Cd				0.0000059	0.0000057	0.0000054	0.0000058	0.0000059				
Calcium Ca				21	19	19	20	21				
Chromium Cr				0.001	0.001	0.001	0.001	0.001				
Cobalt Co				0.0006	0.0006	0.0013	0.0006	0.0007				
Copper Cu				0.0016	0.0019	0.0016	0.0019	0.0019				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00004	0.00008	0.00006	0.00006	0.00006				
Lithium Li				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg				7.3	6.6	6.6	6.6	6.6				
Manganese Mn				0.008	0.021	0.014	0.011	0.011				
Mercury Hg				0.0000009	0.0000009	0.0000009	0.0000009	0.0000010				
Molybdenum Mo				0.00061	0.00055	0.00060	0.00063	0.00065				
Nickel Ni				0.0008	0.0009	0.0008	0.0009	0.0009				
Phosphorus P				0.027	0.027	0.033	0.030	0.031				
Potassium K				4.8	4.1	4.2	4.4	4.5				
Selenium Se				0.00086	0.00056	0.00060	0.00055	0.00055				
Silicon SiO2				0.68	0.66	0.67	0.69	0.70				
Silver Ag				0.0000079	0.0000081	0.0000083	0.0000088	0.0000089				
Sodium Na				39	33	34	33	33				
Strontium Sr				0.042	0.043	0.038	0.042	0.042				
Tellurium Te				0.048	0.048	0.048	0.048	0.048				
Thallium Tl				0.000031	0.000030	0.000031	0.000031	0.000031				
Thorium Th				0.0000024	0.0000026	0.0000028	0.0000029	0.0000030				
Tin Sn				0.00046	0.00046	0.00047	0.00048	0.00049				
Titanium Ti				0.0058	0.0058	0.0058	0.0059	0.0059				
Uranium U				0.000027	0.000032	0.000040	0.000034	0.000034				
Vanadium V				0.0007	0.0002	0.0004	0.0003	0.0003				
Zinc Zn				0.0020	0.0040	0.0037	0.0028	0.0029				
Zirconium Zr				0.0049	0.0049	0.0049	0.0049	0.0049				

Table H 4-A-3
Scenario 4

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter												
TDS				172	157	170	203	215				
TSS				3.9	5.6	5.8	6.7	6.7				
Free CN				0.00013								
Total CN				0.003	0.002	0.002	0.002	0.002				
WAD CN				0.0002								
CNO				0.14								
SCN				0.007	0.006	0.005	0.006	0.005				
Sulphate				9.1	7.9	7.9	8.3	8.2				
Chloride				83	86	91	104	112				
Total Ammonia				0.036	0.056	0.016	0.017	0.017				
Nitrate				0.41	0.38	0.38	0.42	0.42				
Nitrite				0.030	0.010	0.015	0.004	0.005				
Alkalinity				29	27	28	28	28				
OrthoPhosphate-P				0.0112	0.0097	0.0098	0.0108	0.0112				
Phosphate-P				0.0260	0.0259	0.0318	0.0286	0.0290				
Org. Carbon				5.3	5.0	7.2	4.9	4.9				
Hardness CaCO3				50	46	46	47	47				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0013	0.0016	0.0035	0.0014	0.0015				
Arsenic As				0.0006	0.0006	0.0005	0.0005	0.0005				
Barium Ba				0.0034	0.0035	0.0034	0.0035	0.0035				
Beryllium Be				0.00005	0.00004	0.00004	0.00005	0.00005				
Bismuth Bi				0.00091	0.00084	0.00089	0.00099	0.00103				
Boron B				0.034	0.023	0.024	0.023	0.023				
Cadmium Cd				0.0000070	0.0000064	0.0000059	0.0000061	0.0000061				
Calcium Ca				25	22	22	23	23				
Chromium Cr				0.001	0.001	0.001	0.001	0.001				
Cobalt Co				0.0008	0.0007	0.0014	0.0007	0.0007				
Copper Cu				0.0018	0.0020	0.0017	0.0019	0.0019				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00005	0.00008	0.00006	0.00006	0.00006				
Lithium Li				0.0029	0.0029	0.0029	0.0030	0.0030				
Magnesium Mg				7.4	6.7	6.7	6.7	6.7				
Manganese Mn				0.008	0.021	0.014	0.011	0.011				
Mercury Hg				0.0000010	0.0000011	0.0000011	0.0000012	0.0000012				
Molybdenum Mo				0.00077	0.00065	0.00066	0.00066	0.00065				
Nickel Ni				0.0010	0.0010	0.0009	0.0009	0.0009				
Phosphorus P				0.032	0.031	0.037	0.034	0.035				
Potassium K				5.5	4.6	4.5	4.5	4.5				
Selenium Se				0.00087	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.75	0.71	0.70	0.72	0.71				
Silver Ag				0.0000093	0.0000092	0.0000093	0.0000098	0.0000098				
Sodium Na				40	37	41	43	47				
Strontium Sr				0.044	0.044	0.038	0.043	0.043				
Tellurium Te				0.048	0.048	0.048	0.049	0.049				
Thallium Tl				0.000031	0.000031	0.000031	0.000031	0.000031				
Thorium Th				0.0000029	0.0000033	0.0000036	0.0000038	0.0000039				
Tin Sn				0.00051	0.00050	0.00051	0.00053	0.00053				
Titanium Ti				0.0059	0.0059	0.0060	0.0060	0.0060				
Uranium U				0.000028	0.000033	0.000041	0.000035	0.000035				
Vanadium V				0.0007	0.0003	0.0005	0.0004	0.0004				
Zinc Zn				0.0025	0.0043	0.0039	0.0029	0.0029				
Zirconium Zr				0.0049	0.0049	0.0049	0.0049	0.0049				

Table H 4-A-3
Scenario 4

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter												
TDS				227	188	188	210	208				
TSS				3.9	5.7	5.8	6.8	6.8				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.005	0.004	0.004	0.004	0.004				
Sulphate				8.2	6.8	6.7	7.0	6.9				
Chloride				123	108	104	110	109				
Total Ammonia				0.012	0.011	0.017	0.016	0.016				
Nitrate				0.38	0.32	0.31	0.33	0.33				
Nitrite				0.012	0.002	0.003	0.003	0.003				
Alkalinity				29	26	28	28	28				
OrthoPhosphate-P				0.0141	0.0109	0.0104	0.0109	0.0106				
Phosphate-P				0.0291	0.0273	0.0325	0.0289	0.0286				
Org. Carbon				5.4	5.0	7.3	5.0	5.0				
Hardness CaCO3				49	45	45	46	46				
Total Metals												
Aluminum Al				0.04	0.06	0.08	0.08	0.08				
Antimony Sb				0.0015	0.0017	0.0035	0.0013	0.0013				
Arsenic As				0.0006	0.0005	0.0005	0.0005	0.0005				
Barium Ba				0.0033	0.0034	0.0033	0.0034	0.0034				
Beryllium Be				0.00005	0.00004	0.00004	0.00004	0.00004				
Bismuth Bi				0.00120	0.00092	0.00088	0.00092	0.00089				
Boron B				0.034	0.023	0.024	0.023	0.023				
Cadmium Cd				0.0000065	0.0000059	0.0000055	0.0000057	0.0000057				
Calcium Ca				24	20	19	19	19				
Chromium Cr				0.001	0.001	0.001	0.001	0.001				
Cobalt Co				0.0006	0.0006	0.0013	0.0005	0.0005				
Copper Cu				0.0017	0.0018	0.0016	0.0018	0.0018				
Iron Fe				0.05	0.12	0.09	0.09	0.09				
Lead Pb				0.00005	0.00008	0.00006	0.00006	0.00006				
Lithium Li				0.0030	0.0029	0.0029	0.0030	0.0030				
Magnesium Mg				7.4	6.7	6.7	6.6	6.6				
Manganese Mn				0.008	0.021	0.014	0.011	0.011				
Mercury Hg				0.0000012	0.0000012	0.0000012	0.0000013	0.0000013				
Molybdenum Mo				0.00064	0.00052	0.00053	0.00053	0.00052				
Nickel Ni				0.0009	0.0009	0.0008	0.0008	0.0008				
Phosphorus P				0.035	0.032	0.037	0.033	0.033				
Potassium K				4.9	4.0	3.9	3.9	3.9				
Selenium Se				0.00088	0.00058	0.00062	0.00057	0.00057				
Silicon SiO2				0.71	0.67	0.67	0.68	0.68				
Silver Ag				0.0000102	0.0000097	0.0000097	0.0000101	0.0000100				
Sodium Na				57	47	47	46	46				
Strontium Sr				0.043	0.043	0.038	0.042	0.042				
Tellurium Te				0.049	0.049	0.049	0.049	0.049				
Thallium Tl				0.000031	0.000031	0.000031	0.000031	0.000031				
Thorium Th				0.0000039	0.0000041	0.0000045	0.0000048	0.0000050				
Tin Sn				0.00056	0.00052	0.00051	0.00052	0.00052				
Titanium Ti				0.0061	0.0061	0.0062	0.0062	0.0062				
Uranium U				0.000029	0.000034	0.000041	0.000036	0.000036				
Vanadium V				0.0008	0.0003	0.0005	0.0004	0.0004				
Zinc Zn				0.0022	0.0040	0.0037	0.0027	0.0027				
Zirconium Zr				0.0049	0.0049	0.0049	0.0050	0.0050				

Table H 4-A-3
Scenario 4

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter												
TDS				205	164	164	175	171				
TSS				4.0	5.7	5.8	6.7	6.7				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.004	0.003	0.002	0.002	0.002				
Sulphate				6.8	5.4	5.3	5.0	4.7				
Chloride				108	92	88	86	83				
Total Ammonia				0.008	0.013	0.017	0.016	0.016				
Nitrate				0.28	0.22	0.21	0.19	0.18				
Nitrite				0.003	0.003	0.003	0.003	0.003				
Alkalinity				29	26	28	27	27				
OrthoPhosphate-P				0.0107	0.0074	0.0069	0.0059	0.0052				
Phosphate-P				0.0260	0.0241	0.0292	0.0240	0.0233				
Org. Carbon				5.4	5.1	7.3	4.9	4.9				
Hardness CaCO3				48	44	44	44	44				
Total Metals												
Aluminum Al				0.04	0.06	0.08	0.08	0.08				
Antimony Sb				0.0012	0.0014	0.0032	0.0009	0.0008				
Arsenic As				0.0006	0.0005	0.0005	0.0004	0.0004				
Barium Ba				0.0032	0.0033	0.0031	0.0032	0.0031				
Beryllium Be				0.00005	0.00004	0.00004	0.00003	0.00003				
Bismuth Bi				0.00090	0.00062	0.00057	0.00048	0.00043				
Boron B				0.035	0.023	0.024	0.023	0.023				
Cadmium Cd				0.0000062	0.0000055	0.0000050	0.0000047	0.0000046				
Calcium Ca				20	16	15	13	13				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0005	0.0004	0.0011	0.0003	0.0003				
Copper Cu				0.0015	0.0017	0.0015	0.0016	0.0016				
Iron Fe				0.06	0.13	0.09	0.09	0.09				
Lead Pb				0.00004	0.00008	0.00006	0.00005	0.00005				
Lithium Li				0.0030	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg				7.4	6.6	6.7	6.5	6.4				
Manganese Mn				0.007	0.020	0.013	0.010	0.010				
Mercury Hg				0.0000013	0.0000013	0.0000014	0.0000013	0.0000013				
Molybdenum Mo				0.00052	0.00040	0.00040	0.00035	0.00032				
Nickel Ni				0.0008	0.0008	0.0007	0.0006	0.0006				
Phosphorus P				0.030	0.027	0.032	0.026	0.026				
Potassium K				4.4	3.5	3.4	3.1	3.0				
Selenium Se				0.00089	0.00059	0.00063	0.00057	0.00057				
Silicon SiO2				0.68	0.63	0.63	0.61	0.60				
Silver Ag				0.0000103	0.0000095	0.0000096	0.0000084	0.0000077				
Sodium Na				52	42	43	39	38				
Strontium Sr				0.042	0.043	0.037	0.040	0.040				
Tellurium Te				0.049	0.049	0.049	0.049	0.049				
Thallium Tl				0.000031	0.000031	0.000031	0.000030	0.000030				
Thorium Th				0.0000051	0.0000050	0.0000054	0.0000050	0.0000049				
Tin Sn				0.00052	0.00047	0.00047	0.00045	0.00045				
Titanium Ti				0.0063	0.0063	0.0063	0.0062	0.0062				
Uranium U				0.000030	0.000034	0.000042	0.000035	0.000035				
Vanadium V				0.0008	0.0002	0.0004	0.0003	0.0003				
Zinc Zn				0.0019	0.0037	0.0034	0.0022	0.0021				
Zirconium Zr				0.0050	0.0050	0.0050	0.0049	0.0049				

Table H 4-A-3
Scenario 4

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter												
TDS				163	136	139	154	152				
TSS				3.9	5.7	5.8	6.7	6.7				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.002	0.001	0.001	0.001	0.001				
Sulphate				4.4	3.7	3.8	3.7	3.6				
Chloride				79	73	70	72	70				
Total Ammonia				0.005	0.010	0.014	0.013	0.013				
Nitrate				0.09	0.08	0.09	0.08	0.08				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				27	25	27	26	26				
OrthoPhosphate-P				0.0048	0.0035	0.0033	0.0029	0.0026				
Phosphate-P				0.0200	0.0201	0.0256	0.0210	0.0207				
Org. Carbon				5.4	5.0	7.3	4.9	4.9				
Hardness CaCO3				45	42	42	43	43				
Total Metals												
Aluminum Al				0.04	0.06	0.08	0.07	0.07				
Antimony Sb				0.0007	0.0010	0.0029	0.0006	0.0006				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0031	0.0030	0.0030	0.0030				
Beryllium Be				0.00003	0.00002	0.00002	0.00002	0.00002				
Bismuth Bi				0.00039	0.00027	0.00025	0.00022	0.00019				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000041	0.0000039	0.0000035	0.0000033	0.0000032				
Calcium Ca				13	11	10	10	9				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0002	0.0003	0.0009	0.0002	0.0002				
Copper Cu				0.0013	0.0016	0.0013	0.0015	0.0015				
Iron Fe				0.06	0.12	0.09	0.09	0.09				
Lead Pb				0.00003	0.00007	0.00005	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0029	0.0028	0.0028				
Magnesium Mg				7.2	6.4	6.5	6.3	6.3				
Manganese Mn				0.007	0.020	0.013	0.010	0.010				
Mercury Hg				0.0000011	0.0000012	0.0000012	0.0000012	0.0000011				
Molybdenum Mo				0.00030	0.00025	0.00027	0.00024	0.00023				
Nickel Ni				0.0006	0.0007	0.0006	0.0005	0.0005				
Phosphorus P				0.022	0.021	0.027	0.022	0.021				
Potassium K				3.4	2.8	2.8	2.6	2.6				
Selenium Se				0.00088	0.00058	0.00062	0.00056	0.00056				
Silicon SiO2				0.58	0.56	0.57	0.55	0.55				
Silver Ag				0.0000063	0.0000065	0.0000067	0.0000059	0.0000054				
Sodium Na				44	36	38	35	34				
Strontium Sr				0.040	0.041	0.036	0.039	0.039				
Tellurium Te				0.048	0.049	0.049	0.049	0.048				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000031	0.0000032	0.0000036	0.0000032	0.0000031				
Tin Sn				0.00044	0.00042	0.00042	0.00041	0.00041				
Titanium Ti				0.0061	0.0062	0.0062	0.0062	0.0061				
Uranium U				0.000027	0.000032	0.000040	0.000033	0.000033				
Vanadium V				0.0006	0.0002	0.0003	0.0002	0.0002				
Zinc Zn				0.0013	0.0033	0.0030	0.0019	0.0019				
Zirconium Zr				0.0049	0.0049	0.0049	0.0049	0.0049				

Table H 4-A-3
Scenario 4

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter												
TDS				147	125	125	145	145				
TSS				3.9	5.7	5.7	6.7	6.7				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.001	0.000	0.000	0.000	0.000				
Sulphate				3.5	3.1	3.0	3.2	3.2				
Chloride				68	65	61	65	65				
Total Ammonia				0.005	0.007	0.013	0.012	0.012				
Nitrate				0.03	0.02	0.01	0.01	0.01				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				27	25	26	26	26				
OrthoPhosphate-P				0.0026	0.0020	0.0016	0.0016	0.0016				
Phosphate-P				0.0178	0.0186	0.0237	0.0196	0.0196				
Org. Carbon				5.3	5.0	7.2	4.9	4.9				
Hardness CaCO3				44	42	41	43	43				
Total Metals												
Aluminum Al				0.04	0.06	0.08	0.07	0.07				
Antimony Sb				0.0005	0.0009	0.0027	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0028	0.0030	0.0029	0.0030	0.0030				
Beryllium Be				0.00002	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00019	0.00014	0.00010	0.00010	0.00010				
Boron B				0.033	0.022	0.023	0.022	0.022				
Cadmium Cd				0.0000037	0.0000033	0.0000026	0.0000026	0.0000026				
Calcium Ca				10	9	8	8	8				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0001	0.0002	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0012	0.0015	0.0015				
Iron Fe				0.06	0.12	0.09	0.09	0.09				
Lead Pb				0.00003	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.1	6.4	6.4	6.3	6.3				
Manganese Mn				0.007	0.020	0.013	0.010	0.010				
Mercury Hg				0.0000011	0.0000011	0.0000010	0.0000011	0.0000011				
Molybdenum Mo				0.00022	0.00020	0.00021	0.00019	0.00019				
Nickel Ni				0.0005	0.0006	0.0005	0.0005	0.0005				
Phosphorus P				0.018	0.019	0.024	0.020	0.020				
Potassium K				3.0	2.6	2.5	2.4	2.4				
Selenium Se				0.00088	0.00057	0.00061	0.00056	0.00056				
Silicon SiO2				0.55	0.54	0.52	0.53	0.53				
Silver Ag				0.0000054	0.0000056	0.0000043	0.0000046	0.0000045				
Sodium Na				41	34	35	33	33				
Strontium Sr				0.040	0.041	0.035	0.039	0.039				
Tellurium Te				0.048	0.048	0.048	0.048	0.048				
Thallium Tl				0.000030	0.000029	0.000029	0.000029	0.000029				
Thorium Th				0.0000031	0.0000028	0.0000021	0.0000023	0.0000024				
Tin Sn				0.00041	0.00040	0.00039	0.00039	0.00039				
Titanium Ti				0.0061	0.0062	0.0061	0.0061	0.0061				
Uranium U				0.000027	0.000032	0.000038	0.000032	0.000032				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0011	0.0032	0.0028	0.0017	0.0018				
Zirconium Zr				0.0049	0.0049	0.0048	0.0048	0.0048				

Table H 4-A-3
Scenario 4

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter												
TDS				139	120	124	142	141				
TSS				3.9	5.6	5.8	6.7	6.7				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.000	0.000	0.000	0.000	0.000				
Sulphate				3.0	2.8	2.9	3.0	3.0				
Chloride				63	62	60	63	63				
Total Ammonia				0.005	0.007	0.013	0.012	0.012				
Nitrate				0.01	0.01	0.01	0.01	0.01				
Nitrite				0.0019	0.0019	0.002	0.002	0.002				
Alkalinity				27	25	26	26	26				
OrthoPhosphate-P				0.0015	0.0013	0.0012	0.0012	0.0011				
Phosphate-P				0.0167	0.0178	0.0235	0.0192	0.0191				
Org. Carbon				5.3	5.0	7.2	4.9	4.9				
Hardness CaCO3				44	41	41	42	42				
Total Metals												
Aluminum Al				0.04	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0027	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0027	0.0030	0.0029	0.0030	0.0030				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00009	0.00007	0.00007	0.00006	0.00006				
Boron B				0.033	0.022	0.023	0.022	0.022				
Cadmium Cd				0.0000030	0.0000029	0.0000025	0.0000024	0.0000024				
Calcium Ca				9	8	8	8	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0001	0.0002	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0012	0.0015	0.0015				
Iron Fe				0.05	0.12	0.09	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.0	6.4	6.4	6.3	6.3				
Manganese Mn				0.006	0.020	0.013	0.010	0.010				
Mercury Hg				0.0000011	0.0000011	0.0000012	0.0000011	0.0000011				
Molybdenum Mo				0.00018	0.00017	0.00020	0.00017	0.00017				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.018	0.023	0.019	0.019				
Potassium K				2.9	2.5	2.4	2.4	2.3				
Selenium Se				0.00087	0.00057	0.00062	0.00056	0.00055				
Silicon SiO2				0.52	0.52	0.53	0.52	0.52				
Silver Ag				0.0000043	0.0000048	0.0000050	0.0000044	0.0000039				
Sodium Na				39	33	35	32	32				
Strontium Sr				0.039	0.040	0.035	0.039	0.038				
Tellurium Te				0.048	0.048	0.049	0.048	0.048				
Thallium Tl				0.000029	0.000029	0.000029	0.000029	0.000029				
Thorium Th				0.0000022	0.0000022	0.0000023	0.0000021	0.0000020				
Tin Sn				0.00039	0.00039	0.00039	0.00039	0.00038				
Titanium Ti				0.0061	0.0061	0.0062	0.0062	0.0061				
Uranium U				0.000026	0.000031	0.000039	0.000032	0.000032				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0010	0.0031	0.0028	0.0017	0.0017				
Zirconium Zr				0.0048	0.0048	0.0049	0.0048	0.0048				

Table H 4-A-3
Scenario 4

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

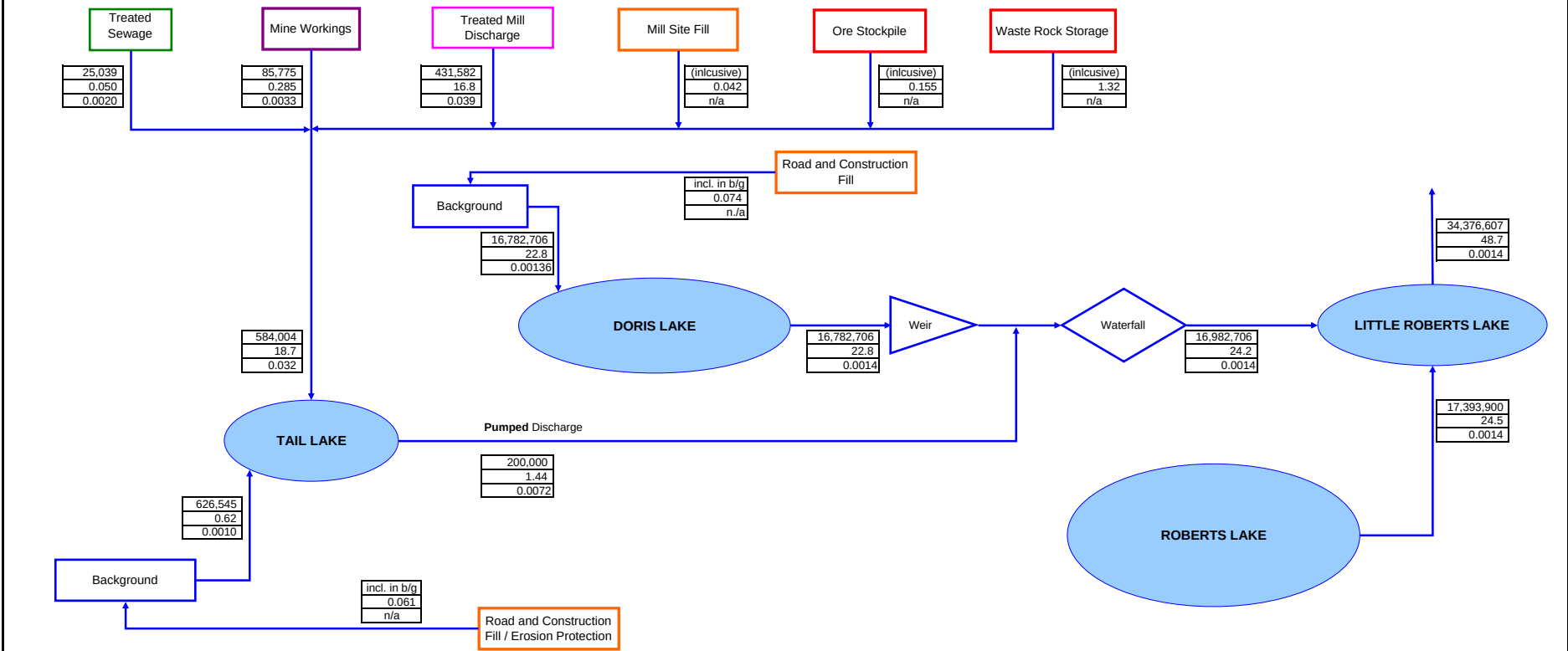
Date	Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter												
TDS				136	118	121	140	140				
TSS				3.9	5.6	5.7	6.7	6.7				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.000	0.000	0.000	0.000	0.000				
Sulphate				2.8	2.7	2.8	2.9	2.9				
Chloride				61	60	58	62	62				
Total Ammonia				0.005	0.007	0.013	0.012	0.012				
Nitrate				0.01	0.01	0.01	0.01	0.01				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				27	25	26	26	26				
OrthoPhosphate-P				0.0011	0.0010	0.0009	0.0009	0.0009				
Phosphate-P				0.0163	0.0176	0.0230	0.0189	0.0189				
Org. Carbon				5.3	5.0	7.2	4.9	4.9				
Hardness CaCO3				44	41	41	42	42				
Total Metals												
Aluminum Al				0.04	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0027	0.0004	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0027	0.0030	0.0028	0.0029	0.0029				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00006	0.00005	0.00004	0.00004	0.00004				
Boron B				0.033	0.022	0.023	0.022	0.022				
Cadmium Cd				0.0000028	0.0000028	0.0000022	0.0000022	0.0000023				
Calcium Ca				9	8	7	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0001	0.0001	0.0008	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0012	0.0014	0.0014				
Iron Fe				0.05	0.12	0.09	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.0	6.3	6.4	6.3	6.3				
Manganese Mn				0.006	0.020	0.013	0.010	0.010				
Mercury Hg				0.0000011	0.0000011	0.0000010	0.0000010	0.0000011				
Molybdenum Mo				0.00017	0.00016	0.00018	0.00017	0.00017				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.016	0.017	0.023	0.019	0.019				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00087	0.00057	0.00061	0.00055	0.00055				
Silicon SiO2				0.52	0.52	0.51	0.51	0.52				
Silver Ag				0.0000040	0.0000047	0.0000037	0.0000039	0.0000038				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.039	0.040	0.034	0.038	0.038				
Tellurium Te				0.048	0.048	0.048	0.048	0.048				
Thallium Tl				0.000029	0.000029	0.000029	0.000029	0.000029				
Thorium Th				0.0000019	0.0000020	0.0000016	0.0000018	0.0000019				
Tin Sn				0.00038	0.00038	0.00038	0.00038	0.00038				
Titanium Ti				0.0061	0.0062	0.0061	0.0061	0.0061				
Uranium U				0.000026	0.000031	0.000038	0.000032	0.000032				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0010	0.0031	0.0027	0.0017	0.0017				
Zirconium Zr				0.0048	0.0048	0.0048	0.0048	0.0048				

Table H 4-A-3
Scenario 4

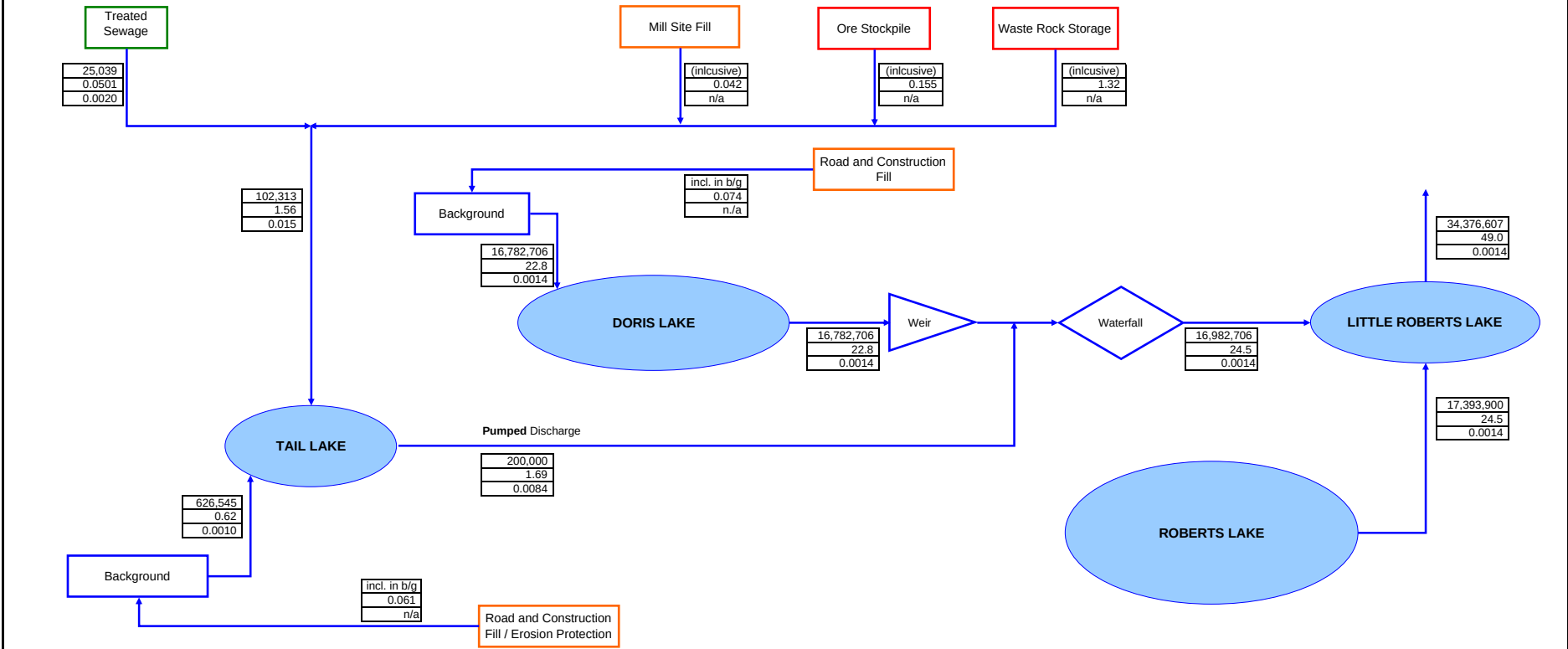
Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16	Year 10 Jan-17
Parameter												
TDS				135	117	121	139	139				
TSS				3.9	5.6	5.8	6.7	6.7				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.000	0.000	0.000	0.000	0.000				
Sulphate				2.7	2.6	2.8	2.9	2.9				
Chloride				60	60	58	62	61				
Total Ammonia				0.005	0.007	0.013	0.012	0.012				
Nitrate				0.01	0.01	0.01	0.01	0.01				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				26	25	26	26	26				
OrthoPhosphate-P				0.0009	0.0009	0.0009	0.0008	0.0008				
Phosphate-P				0.0161	0.0174	0.0232	0.0189	0.0188				
Org. Carbon				5.3	5.0	7.2	4.9	4.9				
Hardness CaCO3				44	41	41	42	42				
Total Metals												
Aluminum Al				0.04	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0027	0.0004	0.0004				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0027	0.0030	0.0029	0.0029	0.0029				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00004	0.00004	0.00004	0.00004	0.00003				
Boron B				0.033	0.022	0.023	0.022	0.022				
Cadmium Cd				0.0000027	0.0000027	0.0000023	0.0000022	0.0000022				
Calcium Ca				8	8	7	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0001	0.0001	0.0008	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0012	0.0014	0.0014				
Iron Fe				0.05	0.12	0.09	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.0	6.3	6.4	6.3	6.3				
Manganese Mn				0.006	0.019	0.013	0.010	0.010				
Mercury Hg				0.0000010	0.0000011	0.0000011	0.0000011	0.0000011				
Molybdenum Mo				0.00016	0.00016	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.016	0.017	0.023	0.018	0.018				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00087	0.00057	0.00062	0.00056	0.00055				
Silicon SiO2				0.51	0.51	0.52	0.51	0.51				
Silver Ag				0.0000037	0.0000044	0.0000047	0.0000041	0.0000037				
Sodium Na				38	33	34	32	32				
Strontium Sr				0.039	0.040	0.035	0.038	0.038				
Tellurium Te				0.048	0.048	0.049	0.048	0.048				
Thallium Tl				0.000029	0.000029	0.000029	0.000029	0.000029				
Thorium Th				0.0000017	0.0000018	0.0000020	0.0000018	0.0000017				
Tin Sn				0.00038	0.00038	0.00038	0.00038	0.00038				
Titanium Ti				0.0061	0.0061	0.0062	0.0061	0.0061				
Uranium U				0.000026	0.000030	0.000038	0.000032	0.000032				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0010	0.0030	0.0027	0.0017	0.0017				
Zirconium Zr				0.0048	0.0048	0.0049	0.0048	0.0048				

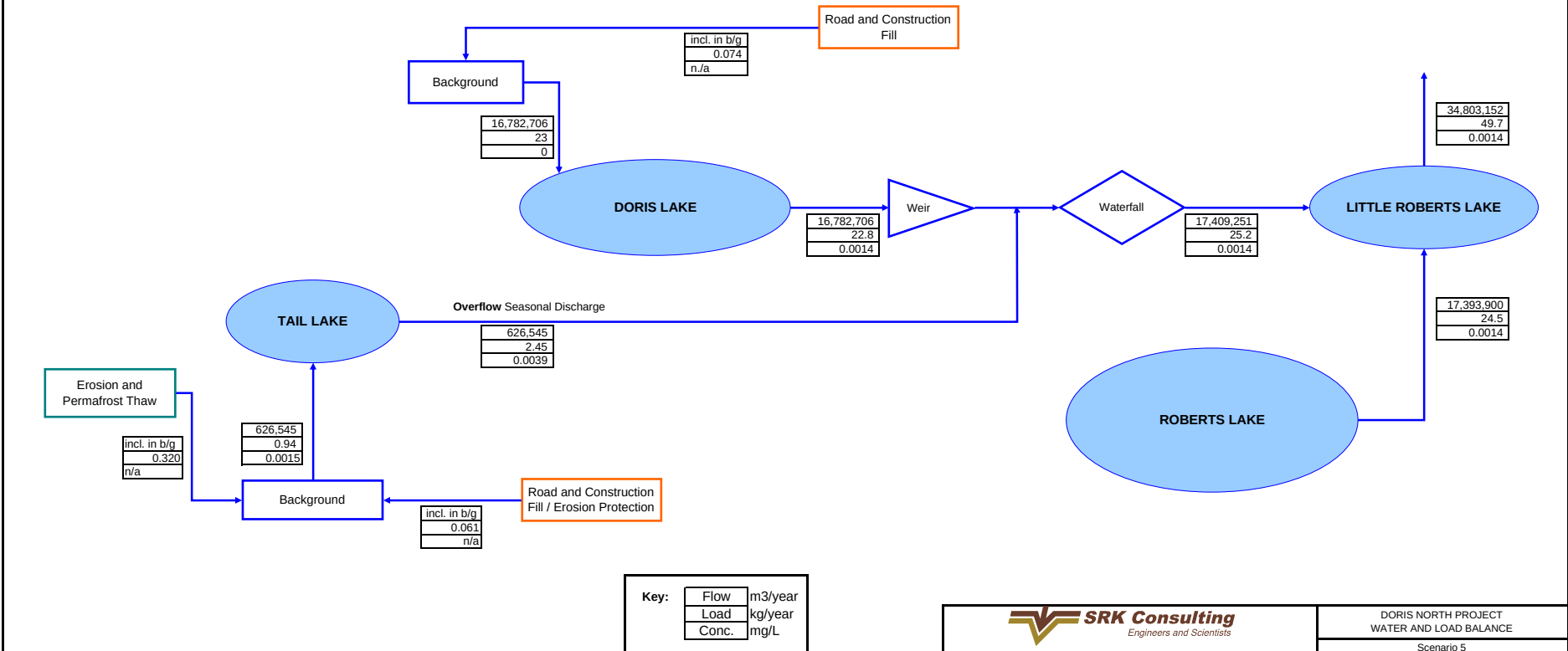
Sceanrio 5 - OPERATIONAL CONDITIONS
Year 2



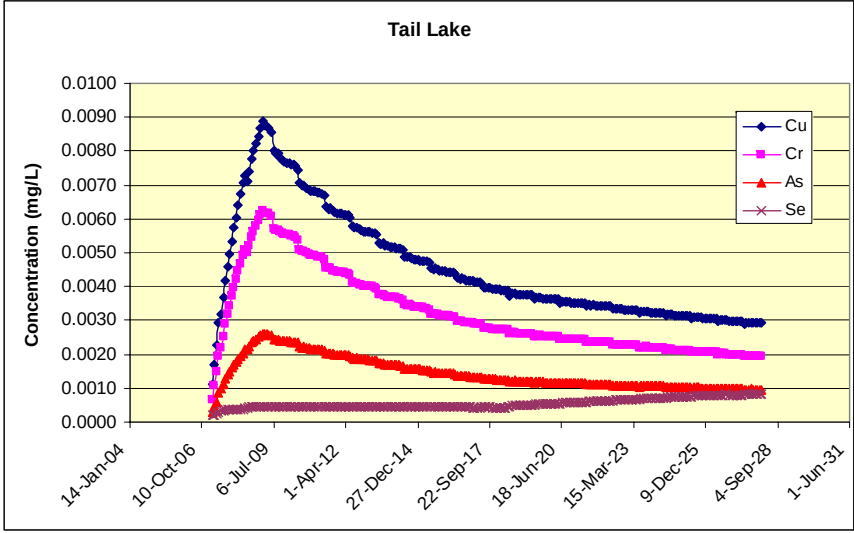
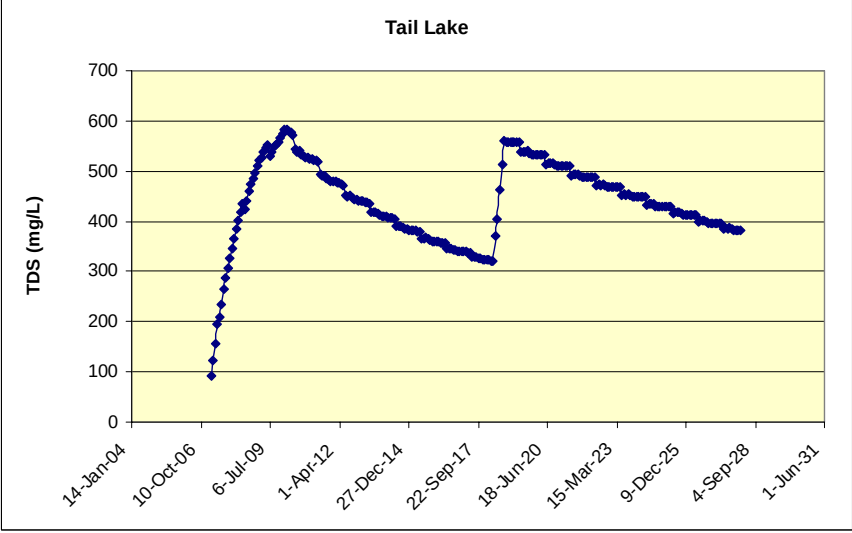
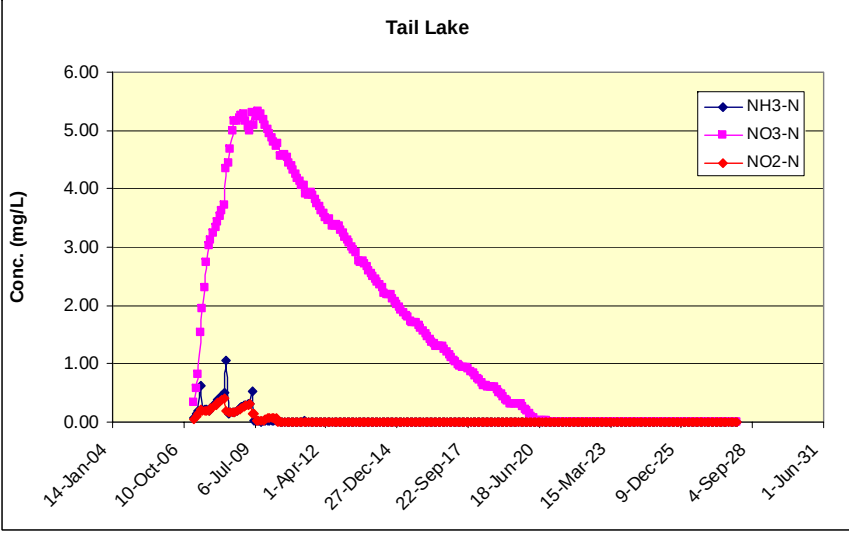
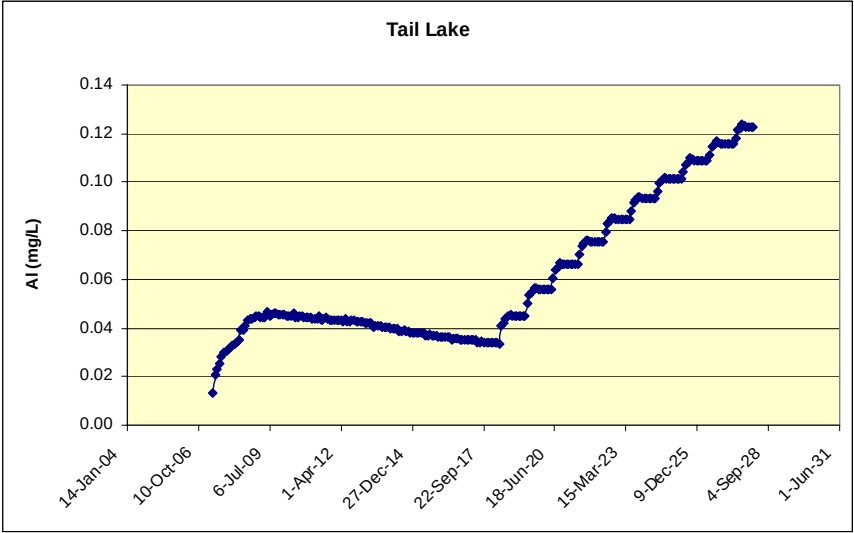
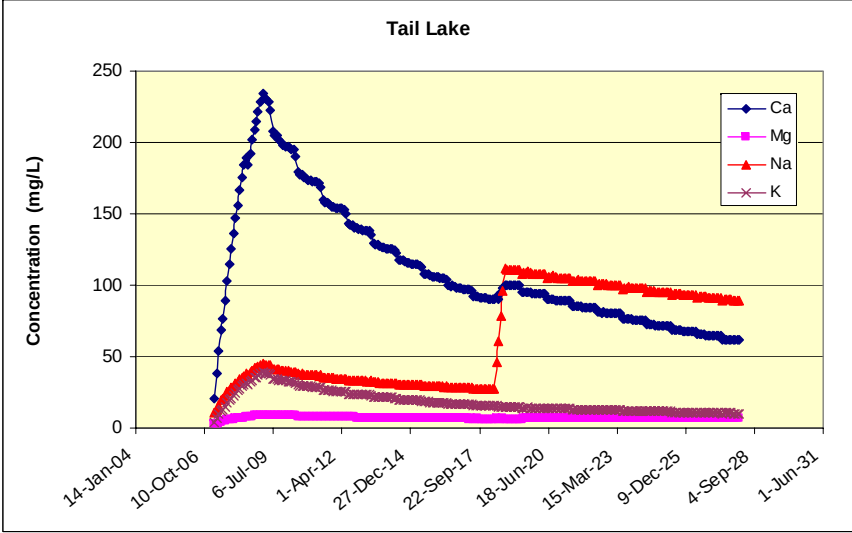
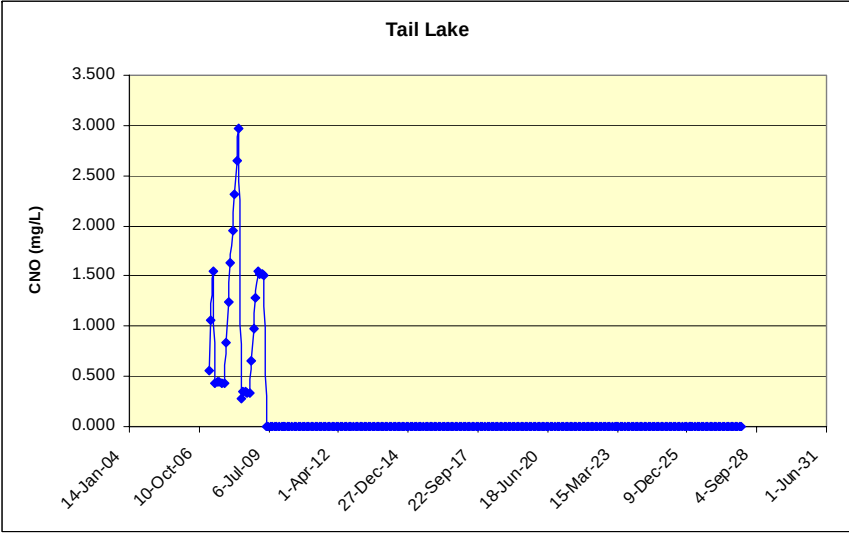
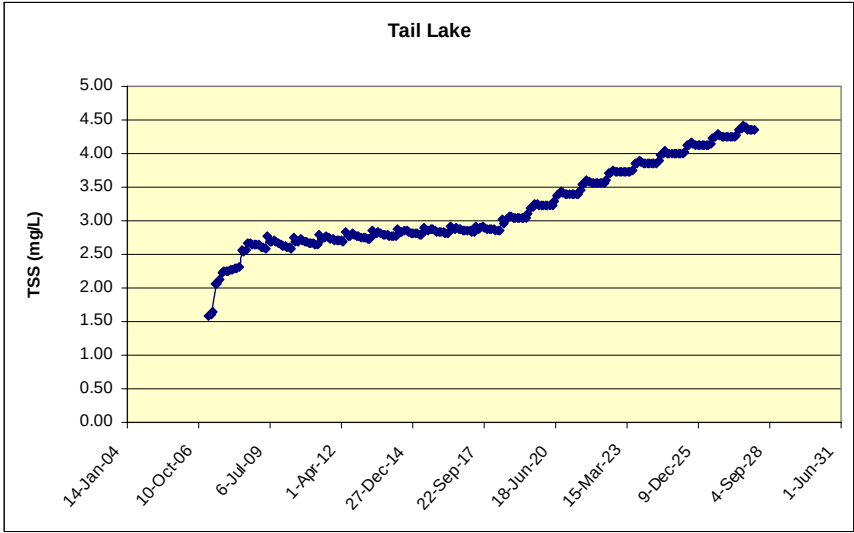
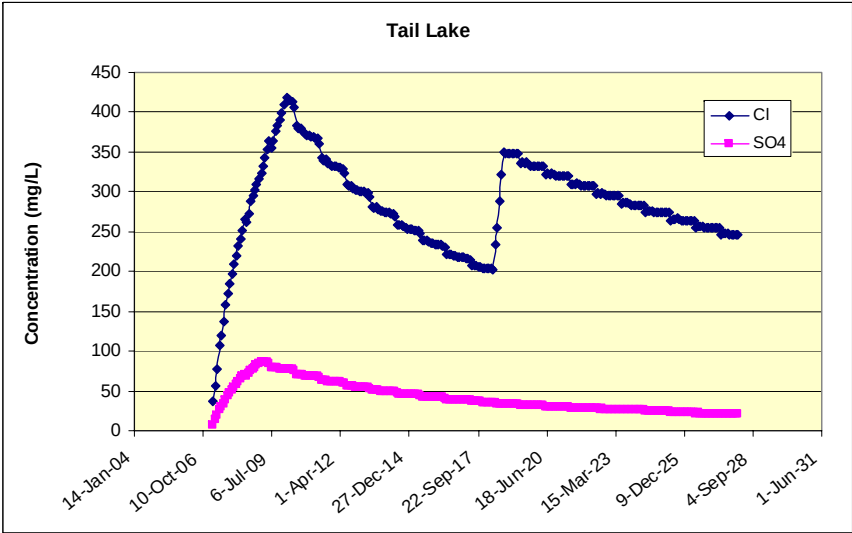
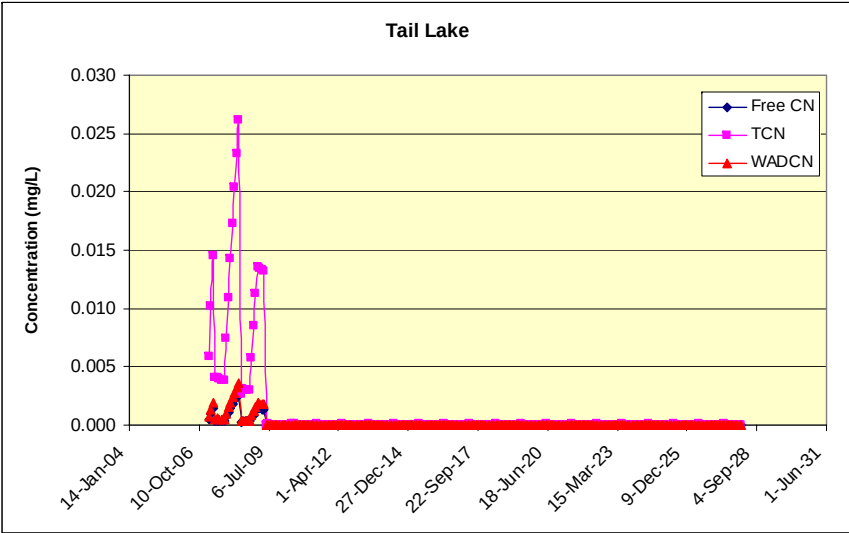
POST MILLING OPERATIONAL CONDITIONS
Year 3



POST CLOSURE CONDITIONS
Year 12



Scenario 5



Scenario 5

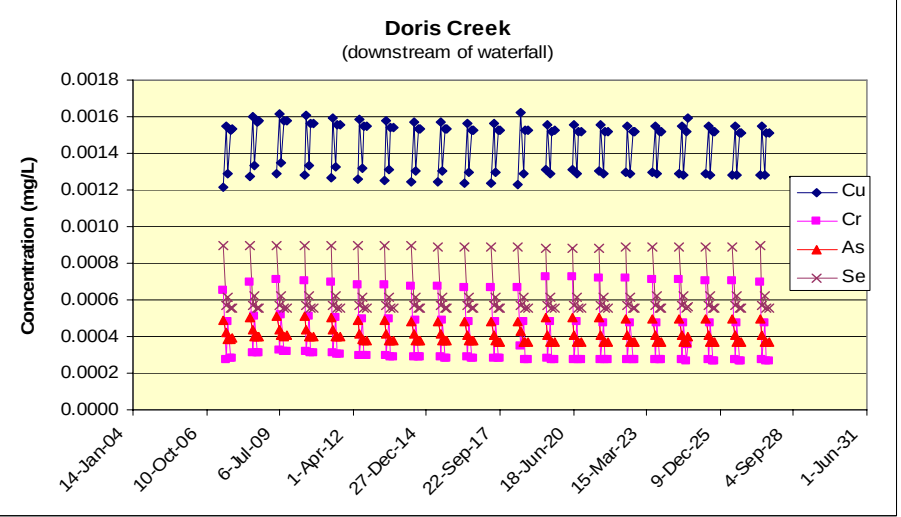
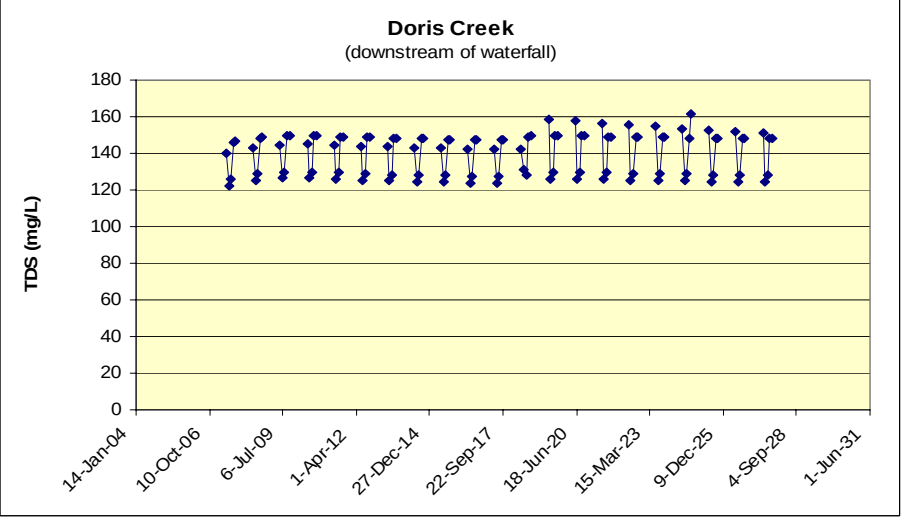
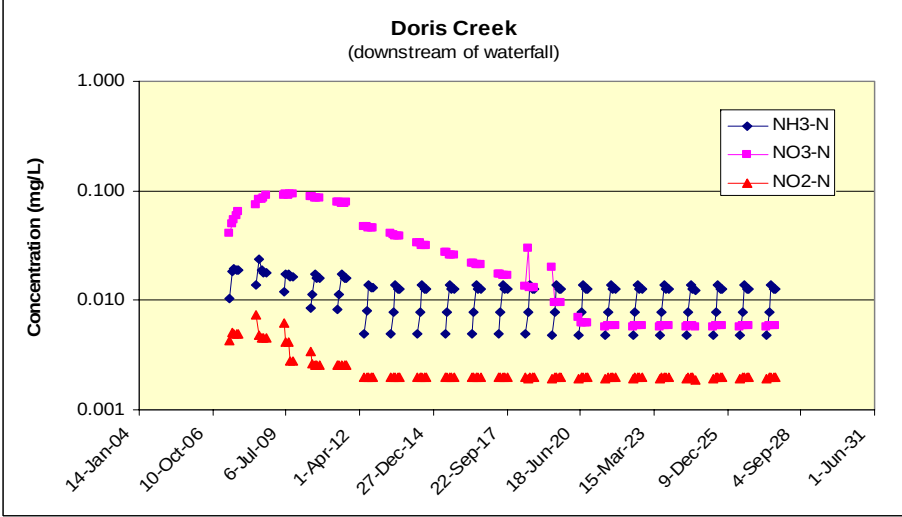
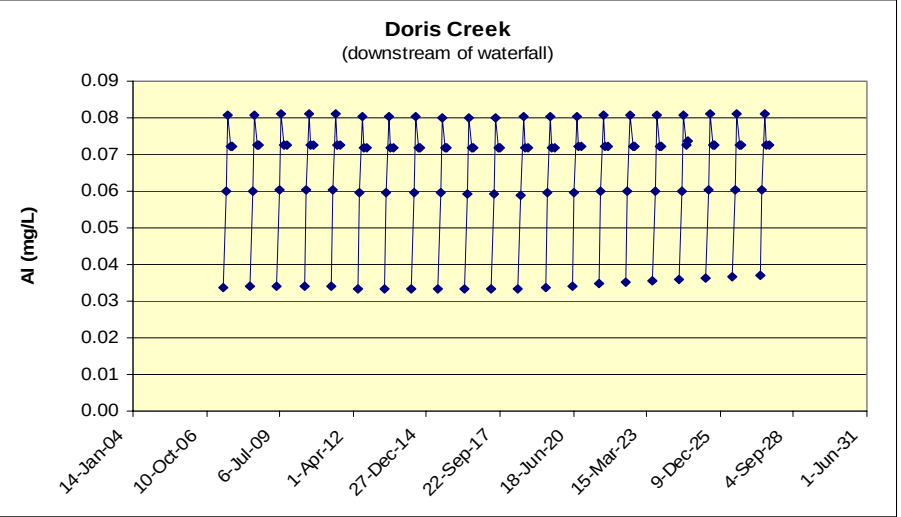
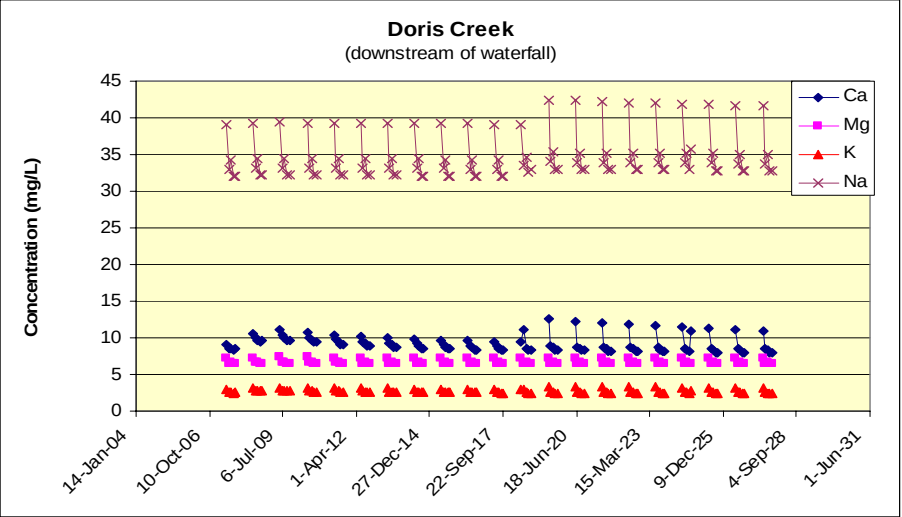
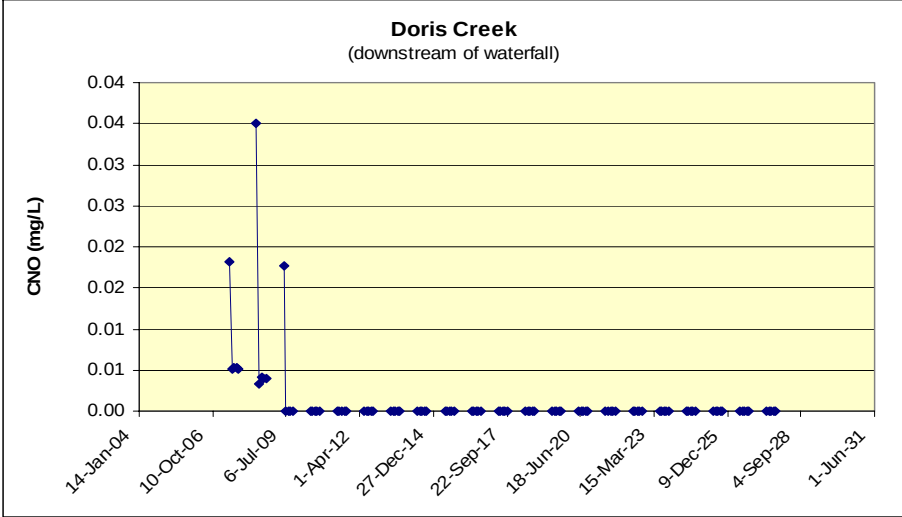
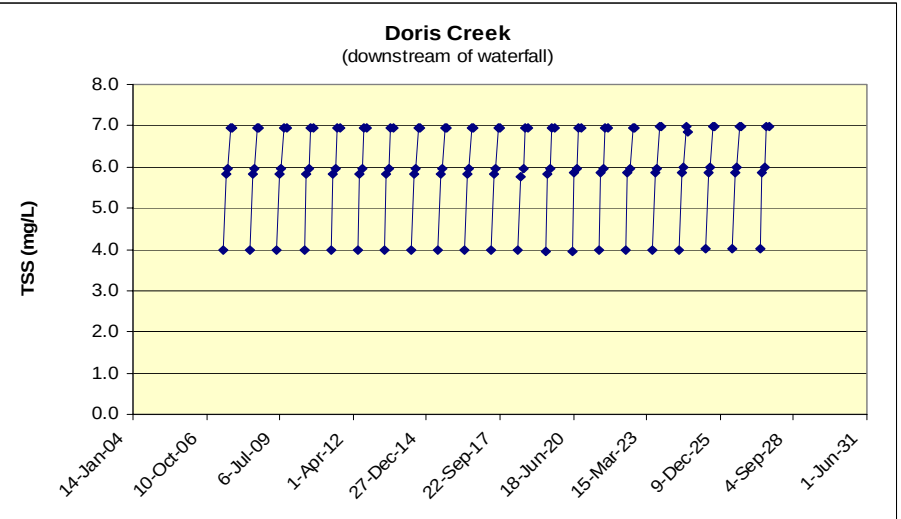
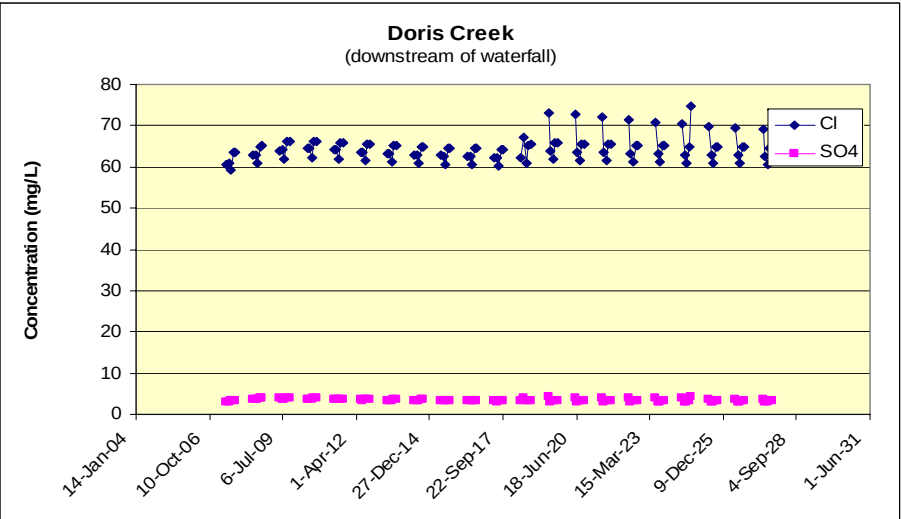
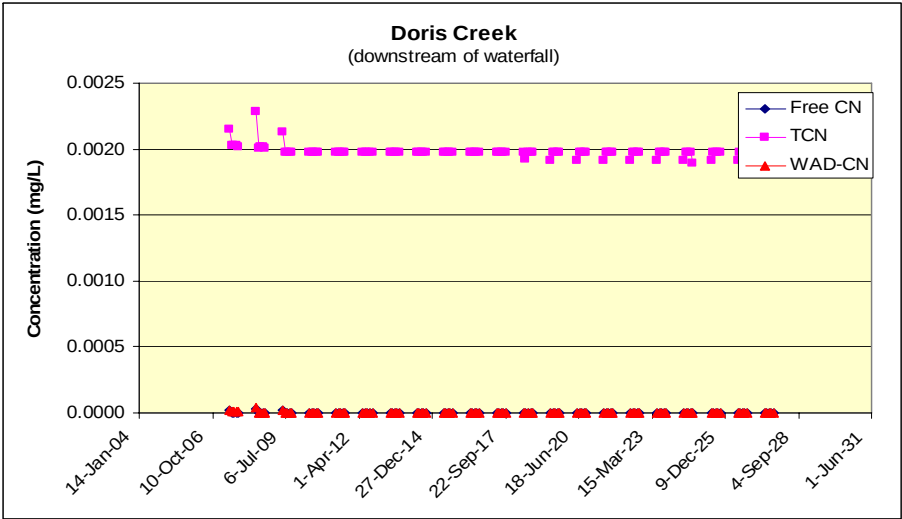


Table H-5-A-1
Scenario 5

OUTPUT SUMMARY						Fraction of CCME in Doris Creek (%)	
Discharge rate		200000 m³/year					
Degradation Field(age)		Tail Lk Cu < CME Year 34					
		MMER	CCME	Tail Lake Year 2	Doris Creek Year 12	L'Roberts L Year 12	
Maximum Concentration							
pH			6 to 9	7 to 8	7 to 8	7 to 8	
TDS	mg/L			584	161	173	
TSS	mg/L			4.4	7.0	8.1	
Free CN	mg/L		0.005	0.0027	0.00003	0.00002	1%
Total CN	mg/L	1.0		0.026	0.002	0.002	
WAD CN	mg/L			0.0036	0.0000	0.0000	
CNO	mg/L			3.0	0.04	0.02	
SCN	mg/L			0.094	0.001	0.001	
Sulphate	mg/L			87	4.2	5.2	
Chloride	mg/L			418	75	73	
Total Ammonia	mg/L		0.97	1.06	0.024	0.013	2%
Nitrate	mg/L		2.9	5.3	0.09	0.05	3%
Nitrite	mg/L		0.018	0.42	0.007	0.005	41%
Alkalinity	mg/L			53	28	26	
OrthoPhosphate-P	mg/L			0.1584	0.0037	0.0025	
Phosphate-P	mg/L			0.1616	0.0255	0.0256	
Org. Carbon	mg/L			6.4	7.5	7.0	
Hardness CaCO3	mg/L			104	46	46	
Total Metals							
Aluminum Al	mg/L		0.1	0.12	0.08	0.25	81%
Antimony Sb	mg/L			0.0145	0.0030	0.0018	
Arsenic As	mg/L	0.5	0.005	0.00	0.0005	0.0005	10%
Barium Ba	mg/L			0.0101	0.0032	0.0052	
Beryllium Be	mg/L			0.00057	0.00002	0.00001	
Bismuth Bi	mg/L			0.01392	0.00029	0.00023	
Boron B	mg/L			0.031	0.034	0.030	
Cadmium Cd	mg/L		0.000038	0.000053	0.0000039	0.0000152	10%
Calcium Ca	mg/L			234	13	10	
Chromium Cr	mg/L		0.001	0.0062	0.0007	0.001	73%
Cobalt Co	mg/L			0.0098	0.0010	0.0004	
Copper Cu	mg/L	0.3	0.002	0.009	0.00162	0.0019	81%
Iron Fe	mg/L		0.3	0.15	0.13	0.28	42%
Lead Pb	mg/L	0.2	0.002	0.00039	0.00007	0.00026	3%
Lithium Li	mg/L			0.0050	0.0029	0.0029	
Magnesium Mg	mg/L			8.9	7.3	7.3	
Manganese Mn	mg/L			0.027	0.021	0.024	
Mercury Hg	mg/L		0.0001	0.0000095	0.00000101	0.0000008	1%
Molybdenum Mo	mg/L		0.073	0.0085	0.00028	0.00028	0%
Nickel Ni	mg/L	0.5	0.025	0.008	0.0007	0.0007	3%
Phosphorus P	mg/L			0.237	0.027	0.026	
Potassium K	mg/L			39	3.3	3.0	
Selenium Se	mg/L		0.001	0.00084	0.0009	0.00083	90%
Silicon SiO2	mg/L			3.8	0.58	0.56	
Silver Ag	mg/L		0.0001	0.00011	0.0000065	0.0000055	6%
Sodium Na	mg/L			112	42	40	
Strontium Sr	mg/L			0.084	0.042	0.047	
Tellurium Te	mg/L			0.052	0.050	0.051	
Thallium Tl	mg/L		0.0008	0.000042	0.000030	0.0020	4%
Thorium Th	mg/L			0.000037	0.0000020	0.0000010	
Tin Sn	mg/L			0.00220	0.00043	0.00002	
Titanium Ti	mg/L			0.0118	0.0062	0.0063	
Uranium U	mg/L			0.000071	0.000040	0.000044	
Vanadium V	mg/L			0.0033	0.0006	0.0005	
Zinc Zn	mg/L	0.5	0.03	0.022	0.0034	0.0053	11%
Zirconium Zr	mg/L			0.0054	0.0050	0.0052	

Table H-5-A-2
Scenario 5

Water Quality in TAIL LAKE

Date		Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter													
TDS	mg/L	92	124	156	195	209	235	264	287	306	327	347	364
TSS	mg/L	1.6	1.6	1.6	2.1	2.1	2.1	2.2	2.3	2.2	2.3	2.3	2.3
Free CN	mg/L	0.00050	0.00096	0.00141	0.00039	0.00041	0.00040	0.00039	0.00040	0.00076	0.00113	0.00148	0.00178
Total CN	mg/L	0.006	0.010	0.015	0.004	0.004	0.004	0.004	0.004	0.007	0.011	0.014	0.017
WAD CN	mg/L	0.0007	0.0013	0.0019	0.0005	0.0005	0.0005	0.0005	0.0005	0.0010	0.0015	0.0020	0.0024
CNO	mg/L	0.55	1.06	1.55	0.43	0.45	0.45	0.43	0.44	0.84	1.24	1.63	1.96
SCN	mg/L	0.008	0.014	0.021	0.027	0.030	0.035	0.040	0.045	0.049	0.054	0.058	0.062
Sulphate	mg/L	7.5	13.4	19.3	25.7	29.1	33.8	39.1	43.4	47.0	50.9	54.6	57.8
Chloride	mg/L	37	57	77	106	120	138	158	172	184	197	209	219
Total Ammonia	mg/L	0.070	0.133	0.194	0.626	0.207	0.216	0.220	0.202	0.247	0.293	0.337	0.376
Nitrate	mg/L	0.35	0.58	0.80	1.54	1.94	2.31	2.74	3.02	3.11	3.23	3.34	3.42
Nitrite	mg/L	0.054	0.102	0.150	0.216	0.200	0.197	0.197	0.195	0.229	0.264	0.297	0.326
Alkalinity	mg/L	16	18	21	26	27	29	32	34	35	37	38	40
OrthoPhosphate-P	mg/L	0.0107	0.0195	0.0282	0.0353	0.0392	0.0459	0.0530	0.0593	0.0648	0.0706	0.0763	0.0811
Phosphate-P	mg/L	0.0142	0.0229	0.0315	0.0395	0.0430	0.0496	0.0567	0.0629	0.0683	0.0741	0.0796	0.0844
Org. Carbon	mg/L	3.0	2.9	2.8	3.5	3.5	3.5	3.6	3.5	3.4	3.3	3.3	3.2
Hardness CaCO3	mg/L	23	29	35	44	47	51	57	61	64	68	72	75
Total Metals													
Aluminum Al	mg/L	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Antimony Sb	mg/L	0.0007	0.0012	0.0018	0.0036	0.0045	0.0052	0.0060	0.0065	0.0067	0.0070	0.0073	0.0075
Arsenic As	mg/L	0.0003	0.0004	0.0006	0.0009	0.0010	0.0011	0.0013	0.0014	0.0015	0.0016	0.0017	0.0018
Barium Ba	mg/L	0.0015	0.0022	0.0028	0.0036	0.0039	0.0044	0.0050	0.0055	0.0058	0.0062	0.0066	0.0070
Beryllium Be	mg/L	0.00012	0.00014	0.00016	0.00024	0.00027	0.00029	0.00032	0.00034	0.00034	0.00035	0.00036	0.00037
Bismuth Bi	mg/L	0.00057	0.00108	0.00159	0.00341	0.00424	0.00489	0.00569	0.00612	0.00635	0.00663	0.00690	0.00712
Boron B	mg/L	0.007	0.008	0.009	0.013	0.014	0.015	0.017	0.018	0.018	0.019	0.019	0.020
Cadmium Cd	mg/L	0.0000044	0.0000075	0.0000105	0.0000167	0.0000196	0.0000225	0.0000261	0.0000284	0.0000301	0.0000320	0.0000338	0.0000353
Calcium Ca	mg/L	21	38	54	69	76	89	103	115	125	136	147	156
Chromium Cr	mg/L	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.003	0.003	0.004	0.004	0.004
Cobalt Co	mg/L	0.0008	0.0015	0.0022	0.0028	0.0032	0.0037	0.0043	0.0048	0.0052	0.0057	0.0061	0.0065
Copper Cu	mg/L	0.0011	0.0017	0.0023	0.0029	0.0032	0.0037	0.0042	0.0046	0.0050	0.0053	0.0057	0.0060
Iron Fe	mg/L	0.02	0.02	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Lead Pb	mg/L	0.00005	0.00007	0.00009	0.00014	0.00016	0.00018	0.00020	0.00022	0.00023	0.00024	0.00025	0.00026
Lithium Li	mg/L	0.0019	0.0020	0.0022	0.0028	0.0029	0.0031	0.0033	0.0034	0.0035	0.0035	0.0036	0.0037
Magnesium Mg	mg/L	2.5	2.9	3.3	4.3	4.6	4.9	5.4	5.7	5.9	6.1	6.4	6.6
Manganese Mn	mg/L	0.002	0.004	0.006	0.008	0.009	0.010	0.012	0.013	0.015	0.016	0.017	0.018
Mercury Hg	mg/L	0.0000006	0.0000010	0.0000013	0.0000019	0.0000021	0.0000024	0.0000028	0.0000030	0.0000032	0.0000034	0.0000036	0.0000037
Molybdenum Mo	mg/L	0.00072	0.00134	0.00194	0.00245	0.00272	0.00319	0.00369	0.00413	0.00451	0.00492	0.00531	0.00564
Nickel Ni	mg/L	0.0008	0.0013	0.0019	0.0025	0.0028	0.0032	0.0037	0.0040	0.0043	0.0047	0.0050	0.0053
Phosphorus P	mg/L	0.020	0.033	0.047	0.063	0.071	0.082	0.094	0.104	0.112	0.121	0.130	0.137
Potassium K	mg/L	3.8	6.6	9.3	11.7	13.0	15.1	17.3	19.3	21.0	22.8	24.6	26.1
Selenium Se	mg/L	0.00022	0.00023	0.00024	0.00031	0.00032	0.00033	0.00035	0.00036	0.00036	0.00036	0.00037	0.00037
Silicon SiO2	mg/L	0.70	0.92	1.14	1.47	1.58	1.76	1.98	2.13	2.26	2.40	2.53	2.65
Silver Ag	mg/L	0.0000525	0.0000537	0.0000548	0.0000762	0.0000796	0.0000809	0.0000845	0.0000851	0.0000845	0.0000846	0.0000848	0.0000848
Sodium Na	mg/L	11	13	16	19	21	23	25	27	28	30	31	33
Strontium Sr	mg/L	0.017	0.021	0.026	0.033	0.036	0.040	0.045	0.048	0.051	0.054	0.057	0.060
Tellurium Te	mg/L	0.025	0.024	0.024	0.029	0.029	0.029	0.030	0.029	0.028	0.028	0.027	0.027
Thallium Tl	mg/L	0.000017	0.000018	0.000019	0.000025	0.000026	0.000027	0.000030	0.000030	0.000031	0.000031	0.000032	0.000032
Thorium Th	mg/L				0.000007	0.000010	0.000012	0.000014	0.000014	0.000013	0.000013	0.000013	0.000013
Tin Sn	mg/L	0.00013	0.00021	0.00028	0.00057	0.00072	0.00082	0.00095	0.00101	0.00104	0.00108	0.00112	0.00115
Titanium Ti	mg/L	0.0030	0.0030	0.0029	0.0038	0.0038	0.0038	0.0040	0.0039	0.0038	0.0038	0.0037	0.0037
Uranium U	mg/L	0.000025	0.000025	0.000024	0.000037	0.000040	0.000041	0.000042	0.000042	0.000041	0.000040	0.000039	0.000039
Vanadium V	mg/L	0.0004	0.0006	0.0007	0.0011	0.0013	0.0014	0.0016	0.0017	0.0018	0.0019	0.0020	0.0020
Zinc Zn	mg/L	0.0020	0.0034	0.0049	0.0064	0.0072	0.0084	0.0098	0.0109	0.0118	0.0127	0.0136	0.0144
Zirconium Zr	mg/L	0.0025	0.0024	0.0023	0.0031	0.0031	0.0031	0.0032	0.0032	0.0031	0.0030	0.0030	0.0029

Table H-5-A-2
Scenario 5

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter													
TDS	mg/L	384	401	418	434	424	440	461	475	485	497	510	521
TSS	mg/L	2.3	2.3	2.3	2.6	2.5	2.6	2.7	2.7	2.6	2.6	2.6	2.6
Free CN	mg/L	0.00211	0.00241	0.00271	0.00025	0.00031	0.00031	0.00030	0.00031	0.00060	0.00088	0.00116	0.00140
Total CN	mg/L	0.020	0.023	0.026	0.003	0.003	0.003	0.003	0.003	0.006	0.009	0.011	0.014
WAD CN	mg/L	0.0028	0.0032	0.0036	0.0003	0.0004	0.0004	0.0004	0.0004	0.0008	0.0012	0.0015	0.0019
CNO	mg/L	2.32	2.65	2.98	0.28	0.35	0.34	0.33	0.34	0.65	0.97	1.28	1.54
SCN	mg/L	0.066	0.070	0.074	0.075	0.073	0.076	0.080	0.083	0.086	0.089	0.091	0.094
Sulphate	mg/L	61.3	64.5	67.7	70.1	68.7	71.7	75.5	78.1	79.9	82.3	84.6	86.6
Chloride	mg/L	231	242	252	265	262	273	287	296	302	309	317	323
Total Ammonia	mg/L	0.417	0.455	0.493	1.063	0.137	0.168	0.170	0.157	0.193	0.230	0.265	0.296
Nitrate	mg/L	3.53	3.62	3.71	4.36	4.43	4.67	4.99	5.16	5.17	5.21	5.25	5.28
Nitrite	mg/L	0.358	0.387	0.416	0.191	0.169	0.166	0.166	0.165	0.192	0.220	0.247	0.270
Alkalinity	mg/L	41	42	44	46	46	47	49	50	51	52	52	53
OrthoPhosphate-P	mg/L	0.0865	0.0913	0.0962	0.0981	0.0956	0.0997	0.1048	0.1086	0.1116	0.1152	0.1188	0.1219
Phosphate-P	mg/L	0.0897	0.0945	0.0992	0.1017	0.0990	0.1031	0.1083	0.1119	0.1148	0.1184	0.1220	0.1250
Org. Carbon	mg/L	3.1	3.1	3.0	3.5	3.5	3.5	3.6	3.5	3.4	3.4	3.3	3.3
Hardness CaCO3	mg/L	78	81	84	88	87	89	94	96	98	100	102	104
Total Metals													
Aluminum Al	mg/L	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05
Antimony Sb	mg/L	0.0078	0.0081	0.0083	0.0094	0.0095	0.0100	0.0106	0.0108	0.0109	0.0111	0.0112	0.0114
Arsenic As	mg/L	0.0019	0.0020	0.0020	0.0022	0.0021	0.0022	0.0023	0.0024	0.0025	0.0025	0.0026	0.0026
Barium Ba	mg/L	0.0073	0.0077	0.0080	0.0083	0.0081	0.0085	0.0089	0.0092	0.0094	0.0096	0.0098	0.0101
Beryllium Be	mg/L	0.00038	0.00038	0.00039	0.00044	0.00045	0.00046	0.00048	0.00049	0.00049	0.00049	0.00050	0.00050
Bismuth Bi	mg/L	0.00739	0.00761	0.00784	0.00888	0.00904	0.00945	0.01004	0.01028	0.01035	0.01049	0.01063	0.01074
Boron B	mg/L	0.020	0.021	0.021	0.023	0.023	0.024	0.025	0.026	0.026	0.026	0.026	0.026
Cadmium Cd	mg/L	0.0000371	0.0000386	0.0000402	0.0000433	0.0000432	0.0000450	0.0000476	0.0000490	0.0000497	0.0000508	0.0000519	0.0000528
Calcium Ca	mg/L	166	175	185	189	184	192	202	209	215	222	228	234
Chromium Cr	mg/L	0.004	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.006	0.006	0.006	0.006
Cobalt Co	mg/L	0.0069	0.0073	0.0077	0.0079	0.0077	0.0080	0.0085	0.0088	0.0090	0.0093	0.0095	0.0098
Copper Cu	mg/L	0.0064	0.0067	0.0070	0.0073	0.0071	0.0074	0.0078	0.0080	0.0082	0.0084	0.0087	0.0089
Iron Fe	mg/L	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00027	0.00028	0.00029	0.00032	0.00032	0.00033	0.00035	0.00036	0.00036	0.00037	0.00037	0.00038
Lithium Li	mg/L	0.0038	0.0038	0.0039	0.0043	0.0042	0.0043	0.0045	0.0045	0.0045	0.0046	0.0046	0.0047
Magnesium Mg	mg/L	6.8	7.0	7.2	7.7	7.6	7.9	8.2	8.4	8.5	8.6	8.7	8.8
Manganese Mn	mg/L	0.019	0.020	0.021	0.022	0.021	0.022	0.023	0.024	0.025	0.026	0.026	0.027
Mercury Hg	mg/L	0.0000039	0.0000040	0.0000042	0.0000045	0.0000045	0.0000047	0.0000049	0.0000051	0.0000051	0.0000053	0.0000054	0.0000054
Molybdenum Mo	mg/L	0.00602	0.00635	0.00669	0.00683	0.00666	0.00694	0.00730	0.00757	0.00777	0.00803	0.00827	0.00849
Nickel Ni	mg/L	0.0056	0.0059	0.0061	0.0064	0.0063	0.0065	0.0069	0.0071	0.0073	0.0075	0.0077	0.0078
Phosphorus P	mg/L	0.146	0.153	0.160	0.167	0.163	0.170	0.179	0.185	0.189	0.195	0.200	0.205
Potassium K	mg/L	27.8	29.3	30.8	31.5	30.7	32.0	33.7	34.9	35.8	36.9	38.0	39.0
Selenium Se	mg/L	0.00038	0.00038	0.00038	0.00043	0.00043	0.00043	0.00045	0.00045	0.00045	0.00045	0.00045	0.00046
Silicon SiO2	mg/L	2.78	2.89	3.01	3.16	3.10	3.21	3.37	3.46	3.52	3.61	3.69	3.76
Silver Ag	mg/L	0.0000852	0.0000852	0.0000854	0.0000992	0.0000999	0.0001008	0.0001035	0.0001036	0.0001027	0.0001024	0.0001021	0.0001019
Sodium Na	mg/L	34	35	37	38	38	39	41	42	42	43	44	45
Strontium Sr	mg/L	0.063	0.065	0.068	0.071	0.069	0.072	0.075	0.078	0.079	0.081	0.083	0.084
Tellurium Te	mg/L	0.026	0.025	0.025	0.029	0.029	0.029	0.030	0.029	0.028	0.028	0.027	0.027
Thallium Tl	mg/L	0.000033	0.000033	0.000034	0.000037	0.000037	0.000038	0.000040	0.000040	0.000040	0.000040	0.000041	0.000041
Thorium Th	mg/L	0.000012	0.000012	0.000012	0.000016	0.000018	0.000019	0.000020	0.000020	0.000020	0.000020	0.000019	0.000019
Tin Sn	mg/L	0.00119	0.00122	0.00125	0.00142	0.00145	0.00152	0.00161	0.00165	0.00166	0.00167	0.00169	0.00171
Titanium Ti	mg/L	0.0036	0.0036	0.0036	0.0041	0.0041	0.0041	0.0042	0.0042	0.0041	0.0041	0.0040	0.0040
Uranium U	mg/L	0.000038	0.000037	0.000037	0.000046	0.000047	0.000047	0.000049	0.000049	0.000047	0.000047	0.000046	0.000045
Vanadium V	mg/L	0.0021	0.0022	0.0022	0.0025	0.0025	0.0026	0.0027	0.0028	0.0028	0.0029	0.0029	0.0029
Zinc Zn	mg/L	0.0153	0.0161	0.0168	0.0174	0.0170	0.0177	0.0188	0.0195	0.0199	0.0205	0.0210	0.0215
Zirconium Zr	mg/L	0.0028	0.0028	0.0027	0.0032	0.0032	0.0032	0.0033	0.0033	0.0032	0.0032	0.0031	0.0030

Table H-5-A-2
Scenario 5

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter													
TDS	mg/L	527	537	547	553	531	537	549	553	558	567	576	584
TSS	mg/L	2.6	2.6	2.6	2.8	2.7	2.7	2.7	2.7	2.7	2.6	2.6	2.6
Free CN	mg/L	0.00138	0.00138	0.00137									
Total CN	mg/L	0.013	0.013	0.013			0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L	0.0018	0.0018	0.0018									
CNO	mg/L	1.52	1.51	1.51									
SCN	mg/L	0.092	0.092	0.091	0.089	0.083	0.081	0.081	0.080	0.079	0.079	0.078	0.078
Sulphate	mg/L	85.8	85.7	85.5	84.5	79.5	79.0	79.4	78.6	78.0	77.9	77.8	77.7
Chloride	mg/L	332	342	353	364	355	364	377	384	391	400	409	418
Total Ammonia	mg/L	0.299	0.304	0.308	0.539	0.018	0.014	0.016	0.009	0.015	0.021	0.026	0.031
Nitrate	mg/L	5.16	5.07	4.99	5.30	5.10	5.23	5.32	5.29	5.18	5.10	5.02	4.94
Nitrite	mg/L	0.283	0.298	0.313	0.139	0.136	0.018	0.018	0.017	0.032	0.047	0.061	0.074
Alkalinity	mg/L	53	52	52	53	50	50	50	49	49	48	48	48
OrthoPhosphate-P	mg/L	0.1258	0.1304	0.1352	0.1367	0.1324	0.1357	0.1402	0.1431	0.1464	0.1504	0.1546	0.1584
Phosphate-P	mg/L	0.1289	0.1335	0.1382	0.1403	0.1358	0.1391	0.1436	0.1464	0.1497	0.1537	0.1579	0.1616
Org. Carbon	mg/L	3.2	3.2	3.2	3.6	3.6	3.6	3.7	3.6	3.6	3.6	3.6	3.6
Hardness CaCO3	mg/L	103	102	101	101	96	95	95	94	93	92	92	91
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Antimony Sb	mg/L	0.0115	0.0118	0.0120	0.0128	0.0127	0.0131	0.0136	0.0137	0.0139	0.0141	0.0143	0.0145
Arsenic As	mg/L	0.0026	0.0026	0.0026	0.0026	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024
Barium Ba	mg/L	0.0099	0.0099	0.0099	0.0098	0.0092	0.0091	0.0092	0.0091	0.0090	0.0089	0.0089	0.0089
Beryllium Be	mg/L	0.00050	0.00051	0.00051	0.00055	0.00054	0.00055	0.00056	0.00056	0.00056	0.00057	0.00057	0.00057
Bismuth Bi	mg/L	0.01091	0.01116	0.01140	0.01223	0.01217	0.01250	0.01301	0.01318	0.01332	0.01352	0.01373	0.01392
Boron B	mg/L	0.026	0.026	0.026	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027
Cadmium Cd	mg/L	0.0000521	0.0000519	0.0000516	0.0000516	0.0000488	0.0000485	0.0000488	0.0000482	0.0000478	0.0000475	0.0000473	0.0000471
Calcium Ca	mg/L	231	230	229	223	208	205	205	202	200	198	198	197
Chromium Cr	mg/L	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
Cobalt Co	mg/L	0.0097	0.0096	0.0096	0.0094	0.0088	0.0087	0.0087	0.0086	0.0085	0.0085	0.0084	0.0084
Copper Cu	mg/L	0.0088	0.0087	0.0087	0.0085	0.0080	0.0079	0.0079	0.0078	0.0077	0.0077	0.0077	0.0076
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00038	0.00038	0.00038	0.00039	0.00037	0.00038	0.00038	0.00038	0.00038	0.00038	0.00038	0.00038
Lithium Li	mg/L	0.0046	0.0046	0.0046	0.0048	0.0046	0.0046	0.0047	0.0047	0.0046	0.0046	0.0046	0.0046
Magnesium Mg	mg/L	8.8	8.7	8.7	8.9	8.6	8.6	8.7	8.6	8.5	8.5	8.5	8.5
Manganese Mn	mg/L	0.027	0.027	0.026	0.026	0.024	0.024	0.024	0.024	0.023	0.023	0.023	0.023
Mercury Hg	mg/L	0.0000054	0.0000054	0.0000053	0.0000054	0.0000051	0.0000051	0.0000051	0.0000050	0.0000050	0.0000050	0.0000049	0.0000049
Molybdenum Mo	mg/L	0.00838	0.00834	0.00829	0.00807	0.00752	0.00743	0.00741	0.00730	0.00722	0.00718	0.00715	0.00712
Nickel Ni	mg/L	0.0078	0.0077	0.0077	0.0077	0.0072	0.0072	0.0072	0.0072	0.0071	0.0071	0.0071	0.0071
Phosphorus P	mg/L	0.208	0.213	0.217	0.220	0.211	0.215	0.220	0.222	0.225	0.229	0.233	0.237
Potassium K	mg/L	38.5	38.3	38.1	37.1	34.6	34.2	34.1	33.6	33.2	33.1	32.9	32.8
Selenium Se	mg/L	0.00045	0.00045	0.00044	0.00047	0.00046	0.00046	0.00046	0.00045	0.00045	0.00045	0.00045	0.00044
Silicon SiO2	mg/L	3.71	3.69	3.68	3.67	3.46	3.43	3.44	3.39	3.36	3.34	3.33	3.32
Silver Ag	mg/L	0.0001012	0.0001012	0.0001013	0.0001108	0.0001094	0.0001094	0.0001107	0.0001099	0.0001093	0.0001092	0.0001092	0.0001092
Sodium Na	mg/L	44	44	44	44	42	41	41	41	40	40	40	40
Strontium Sr	mg/L	0.083	0.083	0.082	0.082	0.078	0.077	0.077	0.076	0.076	0.075	0.075	0.075
Tellurium Te	mg/L	0.027	0.026	0.026	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.029	0.029
Thallium Tl	mg/L	0.000040	0.000040	0.000040	0.000042	0.000040	0.000040	0.000041	0.000040	0.000040	0.000040	0.000039	0.000039
Thorium Th	mg/L	0.000019	0.000019	0.000018	0.000020	0.000021	0.000021	0.000022	0.000022	0.000021	0.000021	0.000021	0.000021
Tin Sn	mg/L	0.00173	0.00177	0.00180	0.00194	0.00193	0.00199	0.00207	0.00209	0.00211	0.00214	0.00217	0.00220
Titanium Ti	mg/L	0.0039	0.0039	0.0039	0.0044	0.0044	0.0044	0.0045	0.0045	0.0044	0.0044	0.0044	0.0044
Uranium U	mg/L	0.000045	0.000045	0.000045	0.000050	0.000050	0.000050	0.000051	0.000051	0.000050	0.000050	0.000050	0.000050
Vanadium V	mg/L	0.0029	0.0030	0.0030	0.0031	0.0031	0.0031	0.0032	0.0032	0.0032	0.0032	0.0032	0.0033
Zinc Zn	mg/L	0.0213	0.0212	0.0212	0.0209	0.0196	0.0194	0.0196	0.0194	0.0192	0.0192	0.0191	0.0191
Zirconium Zr	mg/L	0.0030	0.0030	0.0030	0.0034	0.0033	0.0034	0.0035	0.0034	0.0034	0.0034	0.0033	0.0033

Table H-5-A-2
Scenario 5

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter													
TDS	mg/L	582	580	578	573	542	538	540	534	529	528	526	525
TSS	mg/L	2.6	2.6	2.6	2.8	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.078	0.077	0.077	0.075	0.071	0.070	0.070	0.069	0.069	0.068	0.068	0.068
Sulphate	mg/L	77.4	77.2	77.0	75.3	70.9	70.3	70.3	69.5	68.9	68.7	68.5	68.3
Chloride	mg/L	416	415	413	406	383	380	380	375	372	371	370	369
Total Ammonia	mg/L	0.031	0.031	0.031	0.013	0.008	0.003	0.005	0.002	0.002	0.002	0.002	0.002
Nitrate	mg/L	4.87	4.79	4.72	4.79	4.57	4.55	4.58	4.54	4.45	4.38	4.31	4.25
Nitrite	mg/L	0.074	0.074	0.074	0.004	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Alkalinity	mg/L	48	48	48	48	46	46	47	46	46	46	45	45
OrthoPhosphate-P	mg/L	0.1577	0.1573	0.1568	0.1533	0.1442	0.1428	0.1428	0.1410	0.1399	0.1395	0.1391	0.1388
Phosphate-P	mg/L	0.1610	0.1605	0.1600	0.1569	0.1477	0.1464	0.1464	0.1446	0.1434	0.1429	0.1425	0.1423
Org. Carbon	mg/L	3.5	3.5	3.5	3.9	3.9	3.9	4.0	3.9	3.9	3.9	3.9	3.9
Hardness CaCO3	mg/L	91	91	91	91	87	86	87	86	85	85	85	85
Total Metals													
Aluminum Al	mg/L	0.05	0.05	0.04	0.05	0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0144	0.0144	0.0143	0.0140	0.0132	0.0131	0.0131	0.0129	0.0128	0.0128	0.0127	0.0127
Arsenic As	mg/L	0.0024	0.0024	0.0024	0.0023	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022
Barium Ba	mg/L	0.0088	0.0088	0.0088	0.0087	0.0083	0.0082	0.0082	0.0081	0.0081	0.0080	0.0080	0.0080
Beryllium Be	mg/L	0.00057	0.00057	0.00057	0.00057	0.00055	0.00054	0.00055	0.00054	0.00054	0.00053	0.00053	0.00053
Bismuth Bi	mg/L	0.01387	0.01383	0.01379	0.01347	0.01267	0.01255	0.01255	0.01239	0.01230	0.01225	0.01222	0.01219
Boron B	mg/L	0.027	0.027	0.027	0.027	0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.026
Cadmium Cd	mg/L	0.0000469	0.0000468	0.0000466	0.0000468	0.0000447	0.0000446	0.0000450	0.0000446	0.0000442	0.0000441	0.0000439	0.0000439
Calcium Ca	mg/L	196	195	195	191	179	178	178	176	174	174	173	173
Chromium Cr	mg/L	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Cobalt Co	mg/L	0.0084	0.0083	0.0083	0.0081	0.0077	0.0076	0.0076	0.0075	0.0074	0.0074	0.0074	0.0074
Copper Cu	mg/L	0.0076	0.0076	0.0076	0.0075	0.0070	0.0070	0.0070	0.0069	0.0069	0.0068	0.0068	0.0068
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00038	0.00038	0.00038	0.00038	0.00036	0.00036	0.00036	0.00035	0.00035	0.00035	0.00035	0.00035
Lithium Li	mg/L	0.0046	0.0046	0.0046	0.0047	0.0045	0.0045	0.0046	0.0045	0.0045	0.0045	0.0045	0.0045
Magnesium Mg	mg/L	8.4	8.4	8.4	8.5	8.1	8.1	8.2	8.1	8.0	8.0	8.0	8.0
Manganese Mn	mg/L	0.023	0.023	0.023	0.023	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.020
Mercury Hg	mg/L	0.0000049	0.0000049	0.0000049	0.0000049	0.0000047	0.0000047	0.0000047	0.0000046	0.0000046	0.0000046	0.0000046	0.0000046
Molybdenum Mo	mg/L	0.00709	0.00707	0.00705	0.00689	0.00648	0.00642	0.00642	0.00634	0.00629	0.00627	0.00625	0.00624
Nickel Ni	mg/L	0.0071	0.0070	0.0070	0.0069	0.0065	0.0065	0.0065	0.0064	0.0063	0.0063	0.0063	0.0063
Phosphorus P	mg/L	0.236	0.235	0.235	0.231	0.217	0.215	0.216	0.213	0.211	0.211	0.210	0.210
Potassium K	mg/L	32.6	32.5	32.4	31.8	29.9	29.7	29.7	29.3	29.1	29.0	28.9	28.9
Selenium Se	mg/L	0.00044	0.00044	0.00044	0.00046	0.00045	0.00045	0.00046	0.00045	0.00045	0.00045	0.00045	0.00045
Silicon SiO2	mg/L	3.30	3.29	3.28	3.28	3.12	3.11	3.12	3.09	3.06	3.05	3.04	3.04
Silver Ag	mg/L	0.0001088	0.0001085	0.0001082	0.0001146	0.0001120	0.0001113	0.0001118	0.0001106	0.0001098	0.0001094	0.0001091	0.0001088
Sodium Na	mg/L	40	40	39	40	38	38	38	38	37	37	37	37
Strontium Sr	mg/L	0.074	0.074	0.074	0.074	0.070	0.070	0.070	0.070	0.069	0.069	0.069	0.069
Tellurium Te	mg/L	0.029	0.029	0.029	0.032	0.032	0.032	0.033	0.032	0.032	0.032	0.032	0.032
Thallium Tl	mg/L	0.000039	0.000039	0.000039	0.000041	0.000039	0.000040	0.000040	0.000040	0.000039	0.000039	0.000039	0.000039
Thorium Th	mg/L	0.000021	0.000021	0.000021	0.000023	0.000023	0.000023	0.000024	0.000024	0.000023	0.000023	0.000023	0.000023
Tin Sn	mg/L	0.00219	0.00219	0.00218	0.00214	0.00203	0.00201	0.00202	0.00199	0.00198	0.00197	0.00196	0.00196
Titanium Ti	mg/L	0.0044	0.0044	0.0044	0.0047	0.0046	0.0047	0.0047	0.0047	0.0047	0.0046	0.0046	0.0046
Uranium U	mg/L	0.000050	0.000049	0.000049	0.000054	0.000054	0.000054	0.000055	0.000054	0.000054	0.000054	0.000054	0.000054
Vanadium V	mg/L	0.0032	0.0032	0.0032	0.0032	0.0030	0.0030	0.0030	0.0030	0.0029	0.0029	0.0029	0.0029
Zinc Zn	mg/L	0.0190	0.0189	0.0189	0.0185	0.0175	0.0173	0.0174	0.0172	0.0171	0.0171	0.0170	0.0170
Zirconium Zr	mg/L	0.0033	0.0033	0.0033	0.0036	0.0036	0.0036	0.0037	0.0037	0.0037	0.0037	0.0036	0.0036

Table H-5-A-2
Scenario 5

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter													
TDS	mg/L	524	523	521	517	493	490	491	486	482	481	480	479
TSS	mg/L	2.7	2.7	2.6	2.8	2.7	2.7	2.8	2.8	2.7	2.7	2.7	2.7
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.068	0.068	0.068	0.066	0.063	0.062	0.062	0.061	0.061	0.061	0.061	0.060
Sulphate	mg/L	68.2	68.0	67.8	66.5	63.0	62.5	62.6	61.9	61.4	61.2	61.0	60.9
Chloride	mg/L	369	368	367	361	342	340	340	336	334	333	332	331
Total Ammonia	mg/L	0.002	0.002	0.002	0.013	0.007	0.003	0.004	0.001	0.001	0.001	0.001	0.001
Nitrate	mg/L	4.19	4.12	4.06	4.07	3.90	3.90	3.93	3.90	3.82	3.75	3.69	3.63
Nitrite	mg/L	0.001	0.001	0.001	0.003	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Alkalinity	mg/L	45	45	45	46	44	44	44	44	44	43	43	43
OrthoPhosphate-P	mg/L	0.1385	0.1382	0.1378	0.1349	0.1276	0.1266	0.1266	0.1252	0.1243	0.1239	0.1235	0.1233
Phosphate-P	mg/L	0.1420	0.1416	0.1412	0.1388	0.1313	0.1303	0.1303	0.1289	0.1279	0.1275	0.1272	0.1269
Org. Carbon	mg/L	3.9	3.9	3.9	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Hardness CaCO3	mg/L	84	84	84	84	81	81	81	80	80	80	79	79
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0127	0.0126	0.0126	0.0123	0.0117	0.0116	0.0116	0.0115	0.0114	0.0114	0.0113	0.0113
Arsenic As	mg/L	0.0022	0.0021	0.0021	0.0021	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
Barium Ba	mg/L	0.0080	0.0080	0.0080	0.0079	0.0075	0.0075	0.0075	0.0074	0.0074	0.0074	0.0073	0.0073
Beryllium Be	mg/L	0.00053	0.00053	0.00053	0.00053	0.00051	0.00051	0.00051	0.00051	0.00050	0.00050	0.00050	0.00050
Bismuth Bi	mg/L	0.01217	0.01214	0.01210	0.01185	0.01120	0.01111	0.01111	0.01099	0.01091	0.01087	0.01084	0.01083
Boron B	mg/L	0.026	0.026	0.025	0.026	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
Cadmium Cd	mg/L	0.0000438	0.0000437	0.0000435	0.0000438	0.0000420	0.0000420	0.0000423	0.0000420	0.0000417	0.0000415	0.0000414	0.0000413
Calcium Ca	mg/L	173	172	172	168	159	158	158	156	155	155	154	154
Chromium Cr	mg/L	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004
Cobalt Co	mg/L	0.0074	0.0073	0.0073	0.0072	0.0068	0.0067	0.0067	0.0067	0.0066	0.0066	0.0066	0.0066
Copper Cu	mg/L	0.0068	0.0068	0.0068	0.0067	0.0063	0.0063	0.0063	0.0062	0.0062	0.0062	0.0062	0.0061
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00035	0.00035	0.00035	0.00035	0.00033	0.00033	0.00033	0.00033	0.00033	0.00032	0.00032	0.00032
Lithium Li	mg/L	0.0045	0.0044	0.0044	0.0046	0.0044	0.0044	0.0045	0.0044	0.0044	0.0044	0.0044	0.0044
Magnesium Mg	mg/L	8.0	7.9	7.9	8.0	7.7	7.7	7.8	7.7	7.6	7.6	7.6	7.6
Manganese Mn	mg/L	0.020	0.020	0.020	0.020	0.019	0.019	0.019	0.019	0.018	0.018	0.018	0.018
Mercury Hg	mg/L	0.0000046	0.0000046	0.0000045	0.0000046	0.0000044	0.0000044	0.0000044	0.0000044	0.0000043	0.0000043	0.0000043	0.0000043
Molybdenum Mo	mg/L	0.00623	0.00621	0.00620	0.00607	0.00574	0.00569	0.00569	0.00563	0.00559	0.00557	0.00556	0.00555
Nickel Ni	mg/L	0.0063	0.0063	0.0062	0.0061	0.0058	0.0058	0.0058	0.0057	0.0057	0.0057	0.0056	0.0056
Phosphorus P	mg/L	0.209	0.209	0.208	0.205	0.194	0.193	0.193	0.191	0.189	0.189	0.188	0.188
Potassium K	mg/L	28.8	28.7	28.7	28.1	26.7	26.5	26.5	26.2	26.0	25.9	25.8	25.8
Selenium Se	mg/L	0.00044	0.00044	0.00044	0.00046	0.00045	0.00045	0.00046	0.00046	0.00045	0.00045	0.00045	0.00045
Silicon SiO2	mg/L	3.03	3.02	3.01	3.02	2.89	2.88	2.89	2.86	2.84	2.83	2.82	2.82
Silver Ag	mg/L	0.0001086	0.0001083	0.0001080	0.0001139	0.0001116	0.0001110	0.0001115	0.0001104	0.0001096	0.0001092	0.0001089	0.0001087
Sodium Na	mg/L	37	37	37	37	36	35	36	35	35	35	35	35
Strontium Sr	mg/L	0.068	0.068	0.068	0.068	0.065	0.065	0.065	0.065	0.064	0.064	0.064	0.064
Tellurium Te	mg/L	0.032	0.032	0.032	0.034	0.034	0.034	0.035	0.035	0.034	0.034	0.034	0.034
Thallium Tl	mg/L	0.000039	0.000039	0.000039	0.000040	0.000039	0.000039	0.000040	0.000040	0.000039	0.000039	0.000039	0.000039
Thorium Th	mg/L	0.000023	0.000023	0.000023	0.000025	0.000025	0.000025	0.000026	0.000025	0.000025	0.000025	0.000025	0.000025
Tin Sn	mg/L	0.00196	0.00195	0.00195	0.00192	0.00182	0.00181	0.00182	0.00180	0.00178	0.00178	0.00177	0.00177
Titanium Ti	mg/L	0.0046	0.0046	0.0046	0.0049	0.0048	0.0048	0.0049	0.0049	0.0048	0.0048	0.0048	0.0048
Uranium U	mg/L	0.000053	0.000053	0.000053	0.000057	0.000057	0.000057	0.000058	0.000058	0.000057	0.000057	0.000057	0.000057
Vanadium V	mg/L	0.0029	0.0029	0.0029	0.0029	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027
Zinc Zn	mg/L	0.0169	0.0169	0.0168	0.0166	0.0157	0.0156	0.0157	0.0155	0.0154	0.0154	0.0153	0.0153
Zirconium Zr	mg/L	0.0036	0.0036	0.0036	0.0039	0.0039	0.0039	0.0040	0.0040	0.0039	0.0039	0.0039	0.0039

Table H-5-A-2
Scenario 5

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter													
TDS	mg/L	478	477	475	473	452	450	451	447	444	443	441	441
TSS	mg/L	2.7	2.7	2.7	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.7
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.060	0.060	0.060	0.059	0.056	0.055	0.055	0.055	0.055	0.054	0.054	0.054
Sulphate	mg/L	60.8	60.7	60.5	59.4	56.5	56.2	56.2	55.6	55.3	55.1	54.9	54.9
Chloride	mg/L	331	330	329	324	309	307	308	305	302	302	301	300
Total Ammonia	mg/L	0.001	0.001	0.001	0.012	0.007	0.003	0.004	0.001	0.001	0.001	0.001	0.001
Nitrate	mg/L	3.57	3.51	3.45	3.48	3.36	3.36	3.39	3.36	3.29	3.23	3.17	3.12
Nitrite	mg/L	0.001	0.001	0.001	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Alkalinity	mg/L	43	43	43	44	42	42	43	42	42	42	42	42
OrthoPhosphate-P	mg/L	0.1231	0.1228	0.1224	0.1201	0.1141	0.1133	0.1134	0.1122	0.1114	0.1111	0.1108	0.1106
Phosphate-P	mg/L	0.1267	0.1264	0.1260	0.1241	0.1180	0.1172	0.1173	0.1160	0.1152	0.1149	0.1146	0.1144
Org. Carbon	mg/L	4.1	4.1	4.1	4.4	4.4	4.4	4.5	4.4	4.4	4.4	4.4	4.4
Hardness CaCO3	mg/L	79	79	79	79	76	76	77	76	75	75	75	75
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0113	0.0113	0.0112	0.0110	0.0105	0.0104	0.0104	0.0103	0.0102	0.0102	0.0102	0.0102
Arsenic As	mg/L	0.0020	0.0020	0.0020	0.0020	0.0019	0.0019	0.0019	0.0019	0.0019	0.0018	0.0018	0.0018
Barium Ba	mg/L	0.0073	0.0073	0.0073	0.0072	0.0069	0.0069	0.0069	0.0069	0.0068	0.0068	0.0068	0.0068
Beryllium Be	mg/L	0.00050	0.00050	0.00049	0.00050	0.00048	0.00048	0.00048	0.00048	0.00047	0.00047	0.00047	0.00047
Bismuth Bi	mg/L	0.01080	0.01078	0.01075	0.01054	0.01001	0.00994	0.00995	0.00984	0.00977	0.00974	0.00972	0.00970
Boron B	mg/L	0.025	0.025	0.025	0.025	0.024	0.024	0.025	0.024	0.024	0.024	0.024	0.024
Cadmium Cd	mg/L	0.0000413	0.0000412	0.0000410	0.0000413	0.0000398	0.0000398	0.0000402	0.0000398	0.0000396	0.0000395	0.0000394	0.0000393
Calcium Ca	mg/L	154	153	153	150	143	142	142	141	140	139	139	139
Chromium Cr	mg/L	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Cobalt Co	mg/L	0.0065	0.0065	0.0065	0.0064	0.0061	0.0060	0.0060	0.0060	0.0059	0.0059	0.0059	0.0059
Copper Cu	mg/L	0.0061	0.0061	0.0061	0.0060	0.0058	0.0057	0.0057	0.0057	0.0057	0.0056	0.0056	0.0056
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00032	0.00032	0.00032	0.00032	0.00031	0.00031	0.00031	0.00031	0.00031	0.00030	0.00030	0.00030
Lithium Li	mg/L	0.0043	0.0043	0.0043	0.0045	0.0043	0.0043	0.0044	0.0043	0.0043	0.0043	0.0043	0.0043
Magnesium Mg	mg/L	7.6	7.6	7.5	7.6	7.4	7.4	7.4	7.4	7.3	7.3	7.3	7.3
Manganese Mn	mg/L	0.018	0.018	0.018	0.018	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017
Mercury Hg	mg/L	0.0000043	0.0000043	0.0000043	0.0000043	0.0000041	0.0000041	0.0000042	0.0000041	0.0000041	0.0000041	0.0000041	0.0000041
Molybdenum Mo	mg/L	0.00554	0.00552	0.00551	0.00540	0.00513	0.00510	0.00510	0.00505	0.00501	0.00500	0.00498	0.00498
Nickel Ni	mg/L	0.0056	0.0056	0.0056	0.0055	0.0053	0.0052	0.0052	0.0052	0.0051	0.0051	0.0051	0.0051
Phosphorus P	mg/L	0.188	0.187	0.187	0.184	0.175	0.174	0.175	0.173	0.172	0.171	0.171	0.170
Potassium K	mg/L	25.7	25.7	25.6	25.2	24.0	23.8	23.8	23.6	23.4	23.4	23.3	23.3
Selenium Se	mg/L	0.00045	0.00045	0.00045	0.00047	0.00046	0.00046	0.00046	0.00046	0.00045	0.00045	0.00045	0.00045
Silicon SiO2	mg/L	2.81	2.81	2.80	2.81	2.70	2.69	2.70	2.68	2.66	2.65	2.64	2.64
Silver Ag	mg/L	0.0001085	0.0001083	0.0001080	0.0001133	0.0001112	0.0001108	0.0001113	0.0001102	0.0001095	0.0001091	0.0001089	0.0001087
Sodium Na	mg/L	35	35	34	35	34	33	34	33	33	33	33	33
Strontium Sr	mg/L	0.064	0.063	0.063	0.063	0.061	0.061	0.061	0.061	0.060	0.060	0.060	0.060
Tellurium Te	mg/L	0.034	0.034	0.034	0.036	0.036	0.036	0.037	0.036	0.036	0.036	0.036	0.036
Thallium Tl	mg/L	0.000039	0.000039	0.000039	0.000040	0.000039	0.000039	0.000040	0.000040	0.000039	0.000039	0.000039	0.000039
Thorium Th	mg/L	0.000025	0.000025	0.000025	0.000026	0.000026	0.000026	0.000027	0.000027	0.000027	0.000027	0.000027	0.000027
Tin Sn	mg/L	0.00177	0.00176	0.00176	0.00173	0.00166	0.00165	0.00165	0.00164	0.00163	0.00162	0.00162	0.00161
Titanium Ti	mg/L	0.0048	0.0048	0.0048	0.0051	0.0050	0.0050	0.0051	0.0050	0.0050	0.0050	0.0050	0.0049
Uranium U	mg/L	0.000057	0.000056	0.000056	0.000060	0.000060	0.000060	0.000061	0.000060	0.000060	0.000060	0.000059	0.000059
Vanadium V	mg/L	0.0027	0.0026	0.0026	0.0026	0.0025	0.0025	0.0025	0.0025	0.0025	0.0024	0.0024	0.0024
Zinc Zn	mg/L	0.0153	0.0152	0.0152	0.0150	0.0142	0.0142	0.0143	0.0141	0.0141	0.0140	0.0140	0.0139
Zirconium Zr	mg/L	0.0039	0.0039	0.0039	0.0041	0.0041	0.0041	0.0042	0.0042	0.0041	0.0041	0.0041	0.0041

Table H-5-A-2
Scenario 5

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter													
TDS	mg/L	440	439	438	436	419	417	418	415	412	411	410	409
TSS	mg/L	2.7	2.7	2.7	2.9	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.054	0.054	0.054	0.053	0.050	0.050	0.050	0.050	0.049	0.049	0.049	0.049
Sulphate	mg/L	54.8	54.6	54.5	53.6	51.2	50.9	50.9	50.4	50.1	49.9	49.8	49.7
Chloride	mg/L	300	299	298	294	282	280	281	278	276	275	275	274
Total Ammonia	mg/L	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nitrate	mg/L	3.07	3.01	2.95	2.90	2.76	2.75	2.75	2.72	2.66	2.60	2.55	2.50
Nitrite	mg/L	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alkalinity	mg/L	42	41	41	42	41	41	41	41	41	40	40	40
OrthoPhosphate-P	mg/L	0.1104	0.1101	0.1099	0.1079	0.1030	0.1023	0.1024	0.1014	0.1007	0.1004	0.1002	0.1000
Phosphate-P	mg/L	0.1142	0.1139	0.1136	0.1120	0.1069	0.1063	0.1064	0.1054	0.1047	0.1044	0.1041	0.1039
Org. Carbon	mg/L	4.4	4.4	4.3	4.6	4.6	4.6	4.7	4.6	4.6	4.6	4.6	4.6
Hardness CaCO3	mg/L	75	75	74	75	73	72	73	72	72	72	71	71
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0101	0.0101	0.0101	0.0099	0.0095	0.0094	0.0094	0.0093	0.0093	0.0092	0.0092	0.0092
Arsenic As	mg/L	0.0018	0.0018	0.0018	0.0018	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017
Barium Ba	mg/L	0.0068	0.0067	0.0067	0.0067	0.0064	0.0064	0.0064	0.0064	0.0063	0.0063	0.0063	0.0063
Beryllium Be	mg/L	0.00047	0.00047	0.00047	0.00047	0.00045	0.00045	0.00045	0.00045	0.00044	0.00044	0.00044	0.00044
Bismuth Bi	mg/L	0.00969	0.00966	0.00964	0.00946	0.00902	0.00896	0.00897	0.00888	0.00882	0.00880	0.00878	0.00876
Boron B	mg/L	0.024	0.024	0.024	0.024	0.023	0.023	0.024	0.023	0.023	0.023	0.023	0.023
Cadmium Cd	mg/L	0.0000392	0.0000391	0.0000390	0.0000384	0.0000367	0.0000365	0.0000365	0.0000361	0.0000359	0.0000358	0.0000357	0.0000357
Calcium Ca	mg/L	138	138	138	135	129	129	129	127	127	126	126	126
Chromium Cr	mg/L	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Cobalt Co	mg/L	0.0059	0.0059	0.0059	0.0057	0.0055	0.0055	0.0055	0.0054	0.0054	0.0053	0.0053	0.0053
Copper Cu	mg/L	0.0056	0.0056	0.0056	0.0055	0.0053	0.0053	0.0053	0.0052	0.0052	0.0052	0.0052	0.0052
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00030	0.00030	0.00030	0.00030	0.00029	0.00028	0.00028	0.00028	0.00028	0.00028	0.00028	0.00028
Lithium Li	mg/L	0.0043	0.0042	0.0042	0.0044	0.0042	0.0042	0.0043	0.0042	0.0042	0.0042	0.0042	0.0042
Magnesium Mg	mg/L	7.3	7.2	7.2	7.3	7.1	7.1	7.2	7.1	7.0	7.0	7.0	7.0
Manganese Mn	mg/L	0.016	0.016	0.016	0.016	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015
Mercury Hg	mg/L	0.0000041	0.0000041	0.0000041	0.0000040	0.0000038	0.0000038	0.0000038	0.0000038	0.0000038	0.0000038	0.0000038	0.0000037
Molybdenum Mo	mg/L	0.00497	0.00496	0.00494	0.00486	0.00463	0.00460	0.00461	0.00456	0.00453	0.00452	0.00451	0.00450
Nickel Ni	mg/L	0.0051	0.0051	0.0051	0.0050	0.0048	0.0048	0.0048	0.0047	0.0047	0.0047	0.0047	0.0047
Phosphorus P	mg/L	0.170	0.170	0.169	0.167	0.159	0.158	0.158	0.157	0.156	0.155	0.155	0.154
Potassium K	mg/L	23.2	23.2	23.1	22.8	21.8	21.6	21.7	21.5	21.3	21.3	21.2	21.2
Selenium Se	mg/L	0.00045	0.00045	0.00045	0.00046	0.00045	0.00045	0.00046	0.00045	0.00045	0.00045	0.00045	0.00045
Silicon SiO2	mg/L	2.63	2.63	2.62	2.62	2.53	2.52	2.53	2.51	2.49	2.48	2.48	2.47
Silver Ag	mg/L	0.0001085	0.0001082	0.0001080	0.0001117	0.0001091	0.0001085	0.0001086	0.0001075	0.0001068	0.0001065	0.0001062	0.0001061
Sodium Na	mg/L	33	33	33	33	32	32	32	32	32	32	31	31
Strontium Sr	mg/L	0.060	0.059	0.059	0.059	0.057	0.057	0.058	0.057	0.057	0.056	0.056	0.056
Tellurium Te	mg/L	0.036	0.036	0.036	0.038	0.037	0.038	0.038	0.038	0.038	0.038	0.037	0.037
Thallium Tl	mg/L	0.000039	0.000039	0.000039	0.000040	0.000039	0.000039	0.000039	0.000039	0.000038	0.000038	0.000038	0.000038
Thorium Th	mg/L	0.000027	0.000027	0.000026	0.000026	0.000025	0.000025	0.000025	0.000024	0.000024	0.000024	0.000024	0.000024
Tin Sn	mg/L	0.00161	0.00161	0.00160	0.00158	0.00151	0.00151	0.00151	0.00150	0.00149	0.00148	0.00148	0.00148
Titanium Ti	mg/L	0.0049	0.0049	0.0049	0.0052	0.0051	0.0051	0.0052	0.0051	0.0051	0.0051	0.0051	0.0051
Uranium U	mg/L	0.000059	0.000059	0.000059	0.000061	0.000059	0.000059	0.000059	0.000058	0.000058	0.000058	0.000058	0.000058
Vanadium V	mg/L	0.0024	0.0024	0.0024	0.0024	0.0023	0.0023	0.0023	0.0023	0.0023	0.0022	0.0022	0.0022
Zinc Zn	mg/L	0.0139	0.0139	0.0139	0.0136	0.0130	0.0130	0.0131	0.0129	0.0129	0.0128	0.0128	0.0128
Zirconium Zr	mg/L	0.0041	0.0041	0.0041	0.0043	0.0042	0.0042	0.0043	0.0043	0.0042	0.0042	0.0042	0.0042

Table H-5-A-2
Scenario 5

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter													
TDS	mg/L	408	407	406	405	391	389	391	387	385	384	383	382
TSS	mg/L	2.8	2.8	2.8	2.9	2.8	2.8	2.9	2.8	2.8	2.8	2.8	2.8
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.049	0.049	0.049	0.048	0.046	0.045	0.045	0.045	0.045	0.045	0.044	0.044
Sulphate	mg/L	49.6	49.5	49.4	48.7	46.6	46.4	46.4	46.0	45.7	45.6	45.5	45.4
Chloride	mg/L	274	273	273	269	259	258	258	256	254	253	253	253
Total Ammonia	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nitrate	mg/L	2.45	2.40	2.35	2.30	2.20	2.19	2.19	2.17	2.12	2.07	2.02	1.97
Nitrite	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alkalinity	mg/L	40	40	40	41	40	40	40	40	39	39	39	39
OrthoPhosphate-P	mg/L	0.0999	0.0996	0.0994	0.0978	0.0936	0.0931	0.0932	0.0923	0.0917	0.0915	0.0913	0.0911
Phosphate-P	mg/L	0.1038	0.1035	0.1033	0.1019	0.0977	0.0972	0.0973	0.0964	0.0958	0.0955	0.0953	0.0951
Org. Carbon	mg/L	4.5	4.5	4.5	4.8	4.7	4.8	4.8	4.8	4.7	4.7	4.7	4.7
Hardness CaCO3	mg/L	71	71	71	71	69	69	70	69	69	68	68	68
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0092	0.0092	0.0091	0.0090	0.0086	0.0086	0.0086	0.0085	0.0084	0.0084	0.0084	0.0084
Arsenic As	mg/L	0.0017	0.0017	0.0017	0.0017	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016
Barium Ba	mg/L	0.0063	0.0063	0.0063	0.0062	0.0060	0.0060	0.0060	0.0060	0.0059	0.0059	0.0059	0.0059
Beryllium Be	mg/L	0.00044	0.00044	0.00044	0.00044	0.00043	0.00043	0.00043	0.00042	0.00042	0.00042	0.00042	0.00042
Bismuth Bi	mg/L	0.00875	0.00873	0.00871	0.00855	0.00818	0.00814	0.00815	0.00807	0.00802	0.00800	0.00798	0.00797
Boron B	mg/L	0.023	0.023	0.023	0.023	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022
Cadmium Cd	mg/L	0.0000356	0.0000355	0.0000354	0.0000349	0.0000335	0.0000333	0.0000333	0.0000330	0.0000328	0.0000327	0.0000327	0.0000326
Calcium Ca	mg/L	126	125	125	123	118	117	117	116	116	115	115	115
Chromium Cr	mg/L	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Cobalt Co	mg/L	0.0053	0.0053	0.0053	0.0052	0.0050	0.0050	0.0050	0.0049	0.0049	0.0049	0.0049	0.0049
Copper Cu	mg/L	0.0051	0.0051	0.0051	0.0051	0.0049	0.0049	0.0049	0.0048	0.0048	0.0048	0.0048	0.0048
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00028	0.00028	0.00028	0.00027	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026
Lithium Li	mg/L	0.0042	0.0042	0.0042	0.0043	0.0042	0.0042	0.0042	0.0042	0.0041	0.0041	0.0041	0.0041
Magnesium Mg	mg/L	7.0	7.0	7.0	7.1	6.9	6.9	6.9	6.9	6.8	6.8	6.8	6.8
Manganese Mn	mg/L	0.015	0.015	0.015	0.015	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014
Mercury Hg	mg/L	0.0000037	0.0000037	0.0000037	0.0000037	0.0000035	0.0000035	0.0000035	0.0000035	0.0000035	0.0000035	0.0000035	0.0000035
Molybdenum Mo	mg/L	0.00449	0.00448	0.00447	0.00440	0.00421	0.00419	0.00419	0.00415	0.00413	0.00412	0.00411	0.00410
Nickel Ni	mg/L	0.0047	0.0046	0.0046	0.0046	0.0044	0.0044	0.0044	0.0043	0.0043	0.0043	0.0043	0.0043
Phosphorus P	mg/L	0.154	0.154	0.153	0.151	0.145	0.144	0.144	0.143	0.142	0.142	0.141	0.141
Potassium K	mg/L	21.1	21.1	21.0	20.7	19.9	19.8	19.8	19.6	19.5	19.5	19.4	19.4
Selenium Se	mg/L	0.00044	0.00044	0.00044	0.00046	0.00045	0.00045	0.00045	0.00045	0.00044	0.00044	0.00044	0.00044
Silicon SiO2	mg/L	2.47	2.46	2.46	2.46	2.38	2.37	2.38	2.36	2.35	2.34	2.34	2.33
Silver Ag	mg/L	0.0001059	0.0001056	0.0001054	0.0001089	0.0001067	0.0001061	0.0001062	0.0001052	0.0001046	0.0001043	0.0001040	0.0001039
Sodium Na	mg/L	31	31	31	32	31	31	31	31	30	30	30	30
Strontium Sr	mg/L	0.056	0.056	0.056	0.056	0.054	0.054	0.055	0.054	0.054	0.054	0.053	0.053
Tellurium Te	mg/L	0.037	0.037	0.037	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039
Thallium Tl	mg/L	0.000038	0.000038	0.000038	0.000039	0.000038	0.000038	0.000038	0.000038	0.000038	0.000038	0.000038	0.000037
Thorium Th	mg/L	0.000024	0.000024	0.000024	0.000023	0.000022	0.000022	0.000022	0.000022	0.000022	0.000022	0.000022	0.000022
Tin Sn	mg/L	0.00147	0.00147	0.00147	0.00145	0.00139	0.00139	0.00139	0.00138	0.00137	0.00136	0.00136	0.00136
Titanium Ti	mg/L	0.0051	0.0050	0.0050	0.0053	0.0052	0.0052	0.0053	0.0052	0.0052	0.0052	0.0052	0.0052
Uranium U	mg/L	0.000058	0.000057	0.000057	0.000059	0.000058	0.000057	0.000057	0.000057	0.000057	0.000056	0.000056	0.000056
Vanadium V	mg/L	0.0022	0.0022	0.0022	0.0022	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021
Zinc Zn	mg/L	0.0128	0.0127	0.0127	0.0125	0.0120	0.0119	0.0120	0.0119	0.0119	0.0118	0.0118	0.0118
Zirconium Zr	mg/L	0.0042	0.0042	0.0042	0.0044	0.0043	0.0043	0.0044	0.0043	0.0043	0.0043	0.0043	0.0043

Table H-5-A-2
Scenario 5

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter													
TDS	mg/L	382	381	380	379	367	366	367	364	362	361	360	360
TSS	mg/L	2.8	2.8	2.8	2.9	2.8	2.9	2.9	2.9	2.8	2.8	2.8	2.8
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.044	0.044	0.044	0.043	0.042	0.041	0.041	0.041	0.041	0.041	0.041	0.041
Sulphate	mg/L	45.3	45.3	45.1	44.5	42.8	42.6	42.6	42.3	42.0	41.9	41.8	41.7
Chloride	mg/L	252	252	251	248	239	238	239	237	235	235	234	234
Total Ammonia	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nitrate	mg/L	1.92	1.87	1.82	1.79	1.72	1.71	1.72	1.70	1.65	1.60	1.55	1.51
Nitrite	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alkalinity	mg/L	39	39	39	39	39	39	39	39	38	38	38	38
OrthoPhosphate-P	mg/L	0.0910	0.0908	0.0906	0.0892	0.0856	0.0852	0.0853	0.0846	0.0841	0.0838	0.0837	0.0835
Phosphate-P	mg/L	0.0950	0.0948	0.0946	0.0934	0.0898	0.0894	0.0895	0.0887	0.0882	0.0879	0.0878	0.0876
Org. Carbon	mg/L	4.7	4.7	4.7	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.8
Hardness CaCO3	mg/L	68	68	68	68	66	66	67	66	66	66	66	66
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0084	0.0084	0.0083	0.0082	0.0079	0.0078	0.0079	0.0078	0.0077	0.0077	0.0077	0.0077
Arsenic As	mg/L	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0014	0.0014	0.0014	0.0014
Barium Ba	mg/L	0.0059	0.0059	0.0059	0.0059	0.0057	0.0057	0.0057	0.0056	0.0056	0.0056	0.0056	0.0056
Beryllium Be	mg/L	0.00042	0.00041	0.00041	0.00042	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00039
Bismuth Bi	mg/L	0.00795	0.00794	0.00792	0.00779	0.00748	0.00744	0.00745	0.00738	0.00734	0.00732	0.00730	0.00729
Boron B	mg/L	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.021	0.021	0.021
Cadmium Cd	mg/L	0.0000326	0.0000325	0.0000324	0.0000320	0.0000307	0.0000306	0.0000306	0.0000304	0.0000302	0.0000301	0.0000300	0.0000300
Calcium Ca	mg/L	115	114	114	113	108	108	108	107	106	106	106	106
Chromium Cr	mg/L	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Cobalt Co	mg/L	0.0048	0.0048	0.0048	0.0047	0.0046	0.0045	0.0045	0.0045	0.0045	0.0045	0.0045	0.0044
Copper Cu	mg/L	0.0048	0.0047	0.0047	0.0047	0.0045	0.0045	0.0045	0.0045	0.0045	0.0045	0.0044	0.0044
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00026	0.00026	0.00026	0.00025	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024	0.00024
Lithium Li	mg/L	0.0041	0.0041	0.0041	0.0042	0.0041	0.0041	0.0041	0.0041	0.0041	0.0041	0.0041	0.0041
Magnesium Mg	mg/L	6.8	6.7	6.7	6.8	6.7	6.7	6.7	6.7	6.6	6.6	6.6	6.6
Manganese Mn	mg/L	0.014	0.014	0.014	0.014	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013
Mercury Hg	mg/L	0.0000035	0.0000034	0.0000034	0.0000034	0.0000033	0.0000033	0.0000033	0.0000033	0.0000032	0.0000032	0.0000032	0.0000032
Molybdenum Mo	mg/L	0.00409	0.00409	0.00408	0.00401	0.00385	0.00384	0.00384	0.00381	0.00378	0.00377	0.00377	0.00376
Nickel Ni	mg/L	0.0043	0.0043	0.0043	0.0042	0.0041	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040
Phosphorus P	mg/L	0.141	0.141	0.140	0.138	0.133	0.132	0.132	0.131	0.130	0.130	0.130	0.130
Potassium K	mg/L	19.4	19.3	19.3	19.0	18.3	18.2	18.3	18.1	18.0	18.0	17.9	17.9
Selenium Se	mg/L	0.00044	0.00044	0.00044	0.00045	0.00044	0.00044	0.00045	0.00044	0.00044	0.00044	0.00044	0.00044
Silicon SiO2	mg/L	2.33	2.32	2.32	2.32	2.25	2.25	2.26	2.24	2.23	2.22	2.21	2.21
Silver Ag	mg/L	0.0001037	0.0001035	0.0001032	0.0001066	0.0001045	0.0001041	0.0001042	0.0001033	0.0001027	0.0001024	0.0001022	0.0001020
Sodium Na	mg/L	30	30	30	30	29	29	30	29	29	29	29	29
Strontium Sr	mg/L	0.053	0.053	0.053	0.053	0.052	0.052	0.052	0.052	0.051	0.051	0.051	0.051
Tellurium Te	mg/L	0.039	0.039	0.038	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040
Thallium Tl	mg/L	0.000037	0.000037	0.000037	0.000038	0.000037	0.000037	0.000037	0.000037	0.000037	0.000037	0.000037	0.000037
Thorium Th	mg/L	0.000022	0.000022	0.000022	0.000021	0.000020	0.000020	0.000020	0.000020	0.000020	0.000020	0.000020	0.000020
Tin Sn	mg/L	0.00136	0.00135	0.00135	0.00133	0.00129	0.00128	0.00129	0.00128	0.00127	0.00126	0.00126	0.00126
Titanium Ti	mg/L	0.0052	0.0051	0.0051	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0052
Uranium U	mg/L	0.000056	0.000056	0.000056	0.000057	0.000056	0.000056	0.000056	0.000056	0.000055	0.000055	0.000055	0.000055
Vanadium V	mg/L	0.0021	0.0021	0.0021	0.0020	0.0020	0.0020	0.0020	0.0020	0.0019	0.0019	0.0019	0.0019
Zinc Zn	mg/L	0.0118	0.0117	0.0117	0.0116	0.0111	0.0111	0.0112	0.0111	0.0110	0.0110	0.0110	0.0109
Zirconium Zr	mg/L	0.0043	0.0043	0.0043	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044

Table H-5-A-2
Scenario 5

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE										
Date		Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16
Parameter												
TDS	mg/L	359	358	358	357	346	345	347	344	342	341	341
TSS	mg/L	2.8	2.8	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
Free CN	mg/L											
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L											
CNO	mg/L											
SCN	mg/L	0.041	0.040	0.040	0.040	0.038	0.038	0.038	0.038	0.038	0.037	0.037
Sulphate	mg/L	41.7	41.6	41.5	40.9	39.4	39.3	39.4	39.0	38.8	38.7	38.6
Chloride	mg/L	234	233	233	230	222	222	222	220	219	219	218
Total Ammonia	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nitrate	mg/L	1.46	1.42	1.37	1.35	1.30	1.30	1.30	1.29	1.24	1.19	1.15
Nitrite	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alkalinity	mg/L	38	38	38	38	38	38	38	38	37	37	37
OrthoPhosphate-P	mg/L	0.0834	0.0832	0.0830	0.0818	0.0788	0.0785	0.0785	0.0779	0.0775	0.0773	0.0771
Phosphate-P	mg/L	0.0875	0.0873	0.0871	0.0862	0.0830	0.0827	0.0828	0.0821	0.0817	0.0814	0.0813
Org. Carbon	mg/L	4.8	4.8	4.8	5.0	5.0	5.0	5.1	5.0	5.0	5.0	5.0
Hardness CaCO3	mg/L	65	65	65	66	64	64	64	64	64	63	63
Total Metals												
Aluminum Al	mg/L	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0077	0.0077	0.0076	0.0075	0.0073	0.0072	0.0072	0.0072	0.0071	0.0071	0.0071
Arsenic As	mg/L	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0013	0.0013	0.0013
Barium Ba	mg/L	0.0056	0.0055	0.0055	0.0055	0.0054	0.0054	0.0054	0.0053	0.0053	0.0053	0.0053
Beryllium Be	mg/L	0.00039	0.00039	0.00039	0.00040	0.00038	0.00038	0.00038	0.00038	0.00038	0.00038	0.00038
Bismuth Bi	mg/L	0.00728	0.00726	0.00725	0.00714	0.00687	0.00684	0.00684	0.00679	0.00675	0.00673	0.00672
Boron B	mg/L	0.021	0.021	0.021	0.022	0.021	0.021	0.021	0.021	0.021	0.021	0.021
Cadmium Cd	mg/L	0.0000300	0.0000299	0.0000298	0.0000294	0.0000284	0.0000283	0.0000283	0.0000281	0.0000279	0.0000279	0.0000278
Calcium Ca	mg/L	105	105	105	104	100	99	100	99	98	98	98
Chromium Cr	mg/L	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Cobalt Co	mg/L	0.0044	0.0044	0.0044	0.0044	0.0042	0.0042	0.0042	0.0041	0.0041	0.0041	0.0041
Copper Cu	mg/L	0.0044	0.0044	0.0044	0.0044	0.0042	0.0042	0.0042	0.0042	0.0042	0.0042	0.0042
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00024	0.00024	0.00024	0.00024	0.00023	0.00023	0.00023	0.00023	0.00023	0.00022	0.00022
Lithium Li	mg/L	0.0041	0.0040	0.0040	0.0041	0.0041	0.0041	0.0041	0.0041	0.0041	0.0040	0.0040
Magnesium Mg	mg/L	6.6	6.6	6.5	6.6	6.5	6.5	6.5	6.5	6.4	6.4	6.4
Manganese Mn	mg/L	0.013	0.013	0.013	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012
Mercury Hg	mg/L	0.0000032	0.0000032	0.0000032	0.0000032	0.0000031	0.0000031	0.0000031	0.0000030	0.0000030	0.0000030	0.0000030
Molybdenum Mo	mg/L	0.00375	0.00375	0.00374	0.00368	0.00355	0.00353	0.00354	0.00351	0.00349	0.00348	0.00347
Nickel Ni	mg/L	0.0040	0.0040	0.0039	0.0039	0.0038	0.0038	0.0038	0.0037	0.0037	0.0037	0.0037
Phosphorus P	mg/L	0.129	0.129	0.129	0.127	0.123	0.122	0.122	0.121	0.121	0.120	0.120
Potassium K	mg/L	17.9	17.8	17.8	17.6	16.9	16.9	16.9	16.8	16.7	16.6	16.6
Selenium Se	mg/L	0.00044	0.00044	0.00043	0.00045	0.00044	0.00044	0.00044	0.00044	0.00044	0.00043	0.00043
Silicon SiO2	mg/L	2.21	2.20	2.20	2.21	2.14	2.14	2.15	2.13	2.12	2.12	2.11
Silver Ag	mg/L	0.0001018	0.0001016	0.0001014	0.0001045	0.0001027	0.0001023	0.0001024	0.0001016	0.0001010	0.0001008	0.0001005
Sodium Na	mg/L	29	29	29	29	28	28	29	28	28	28	28
Strontium Sr	mg/L	0.051	0.051	0.051	0.051	0.050	0.050	0.050	0.049	0.049	0.049	0.049
Tellurium Te	mg/L	0.040	0.040	0.040	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041
Thallium Tl	mg/L	0.000037	0.000037	0.000037	0.000038	0.000037	0.000037	0.000037	0.000037	0.000037	0.000037	0.000036
Thorium Th	mg/L	0.000020	0.000020	0.000020	0.000020	0.000019	0.000019	0.000019	0.000019	0.000018	0.000018	0.000018
Tin Sn	mg/L	0.00126	0.00126	0.00125	0.00124	0.00120	0.00119	0.00120	0.00119	0.00118	0.00118	0.00118
Titanium Ti	mg/L	0.0052	0.0052	0.0052	0.0054	0.0053	0.0054	0.0054	0.0054	0.0054	0.0053	0.0053
Uranium U	mg/L	0.000055	0.000055	0.000055	0.000056	0.000055	0.000055	0.000055	0.000055	0.000054	0.000054	0.000054
Vanadium V	mg/L	0.0019	0.0019	0.0019	0.0019	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018
Zinc Zn	mg/L	0.0109	0.0109	0.0109	0.0107	0.0104	0.0103	0.0104	0.0103	0.0103	0.0103	0.0102
Zirconium Zr	mg/L	0.0044	0.0043	0.0043	0.0045	0.0044	0.0045	0.0045	0.0045	0.0044	0.0044	0.0044

Table H 5-A-3
Scenario 5

Loadings to Tail Lake (kg/month)												
Date	Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter												
TDS	81148	78530	81148	117442	100918	86255	86187	83161	78530	81148	81148	73295
TSS	183	177	183	1239	678	336	369	234	177	183	183	166
Free CN	1.10	1.06	1.10	1.06	1.10	1.10	1.06	1.10	1.06	1.10	1.10	0.99
Total CN	11	10	11	11	11	11	10	11	10	11	11	10
WAD CN	1.47	1.42	1.47	1.42	1.47	1.47	1.42	1.47	1.42	1.47	1.47	1.32
CNO	1210	1171	1210	1171	1210	1210	1171	1210	1171	1210	1210	1093
SCN	16	16	16	16	16	16	16	16	16	16	16	15
Sulphate	14302	13840	14302	18322	17068	15395	15292	14792	13840	14302	14302	12918
Chloride	49110	47526	49110	82360	70942	57269	58107	52599	47526	49110	49110	44357
Total Ammonia	149	145	149	288	238	187	194	166	145	149	149	135
Nitrate	758	733	758	1855	1453	1051	1108	888	733	758	758	684
Nitrite	116	112	116	139	132	123	121	119	112	116	116	105
Alkalinity	6928	6704	6928	15548	12035	8307	8300	7347	6704	6928	6928	6257
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	24	22	22	21	21	21	21	21	19
Org. Carbon				2122.46	1153.25	306.45	319.06	83.87				
Hardness CaCO3	14992	14508	14992	26182	22076	16882	16933	15629	14508	14992	14992	13541
Total Metals												
Aluminum Al	4.47	4.33	4.47	19.31	12.05	9.20	8.80	5.91	4.33	4.47	4.47	4.04
Antimony Sb	1.32	1.28	1.32	4.67	3.44	2.22	2.44	1.72	1.28	1.32	1.32	1.19
Arsenic As	0.39	0.38	0.39	0.69	0.59	0.47	0.47	0.43	0.38	0.39	0.39	0.36
Barium Ba	1.56	1.51	1.56	2.29	2.00	1.75	1.72	1.62	1.51	1.56	1.56	1.41
Beryllium Be	0.05	0.05	0.05	0.23	0.15	0.08	0.09	0.06	0.05	0.05	0.05	0.04
Bismuth Bi	1.23	1.19	1.23	4.55	3.31	2.10	2.31	1.62	1.19	1.23	1.23	1.11
Boron B	2.80	2.71	2.80	10.30	7.35	4.49	4.71	3.42	2.71	2.80	2.80	2.53
Cadmium Cd	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Calcium Ca	40484	39178	40484	42156	42154	41150	39982	40729	39178	40484	40484	36566
Chromium Cr	1.02	0.99	1.02	1.32	1.26	1.11	1.06	1.04	0.99	1.02	1.02	0.92
Cobalt Co	1.67	1.62	1.67	1.85	1.81	1.73	1.69	1.70	1.62	1.67	1.67	1.51
Copper Cu	1.46	1.41	1.46	1.84	1.69	1.52	1.49	1.48	1.41	1.46	1.46	1.32
Iron Fe	4.63	4.48	4.63	21.53	11.59	9.22	9.30	5.96	4.48	4.63	4.63	4.18
Lead Pb	0.05	0.05	0.05	0.13	0.10	0.07	0.07	0.06	0.05	0.05	0.05	0.04
Lithium Li	0.46	0.45	0.46	1.84	1.14	0.69	0.73	0.54	0.45	0.46	0.46	0.42
Magnesium Mg	1082	1047	1082	2866	2076	1454	1459	1201	1047	1082	1082	977
Manganese Mn	4.56	4.41	4.56	5.17	4.97	4.80	4.75	4.66	4.41	4.56	4.56	4.12
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	1.48	1.43	1.48	1.50	1.52	1.49	1.45	1.48	1.43	1.48	1.48	1.34
Nickel Ni	1.26	1.22	1.26	1.77	1.58	1.38	1.37	1.31	1.22	1.26	1.26	1.14
Phosphorus P	33	32	33	45	40	36	36	35	32	33	33	30
Potassium K	6696	6480	6696	7119	7031	6792	6626	6737	6480	6696	6696	6048
Selenium Se	0.04	0.04	0.04	0.21	0.12	0.06	0.07	0.05	0.04	0.04	0.04	0.03
Silicon SiO2	556	538	556	963	770	630	631	583	538	556	556	502
Silver Ag	0.01	0.01	0.01	0.06	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sodium Na	6353	6148	6353	11746	9478	7289	7324	6664	6148	6353	6353	5739
Strontium Sr	12	12	12	21	18	14	14	13	12	12	12	11
Tellurium Te	0.02	0.02	0.02	17.74	8.28	2.58	3.22	0.86	0.02	0.02	0.02	0.02
Thallium Tl	0.00	0.00	0.00	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.02	0.01	0.00	0.01	0.00				
Tin Sn	0.18	0.18	0.18	0.74	0.56	0.34	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.10	0.09	0.10	2.42	1.21	0.46	0.54	0.22	0.09	0.10	0.10	0.09
Uranium U	0.00	0.00	0.00	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.36	0.35	0.36	1.09	0.79	0.52	0.54	0.43	0.35	0.36	0.36	0.33
Zinc Zn	3.5	3.4	3.5	4.4	4.1	3.8	4.2	3.7	3.4	3.5	3.5	3.2
Zirconium Zr				2.10	1.03	0.34	0.43	0.12				

Table H 5-A-3
Scenario 5

Loadings to Tail Lake (kg/month)												
Date	Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter												
TDS	81148	78530	81148	115925	100247	86089	85941	83098	78530	81148	81148	73295
TSS	183	177	183	1197	661	332	363	232	177	183	183	166
Free CN	1.10	1.06	1.10	1.06	1.10	1.10	1.06	1.10	1.06	1.10	1.10	0.99
Total CN	11	10	11	11	11	11	10	11	10	11	11	10
WAD CN	1.47	1.42	1.47	1.42	1.47	1.47	1.42	1.47	1.42	1.47	1.47	1.32
CNO	1210	1171	1210	1171	1210	1210	1171	1210	1171	1210	1210	1093
SCN	16	16	16	16	16	16	16	16	16	16	16	15
Sulphate	14302	13840	14302	18295	17053	15392	15286	14791	13840	14302	14302	12918
Chloride	49110	47526	49110	81960	70719	57212	58031	52580	47526	49110	49110	44357
Total Ammonia	149	145	149	288	238	187	194	166	145	149	149	135
Nitrate	758	733	758	1855	1453	1051	1108	888	733	758	758	684
Nitrite	116	112	116	139	132	123	121	119	112	116	116	105
Alkalinity	6928	6704	6928	15203	11862	8262	8248	7334	6704	6928	6928	6257
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	24	22	22	21	21	21	21	21	19
Org. Carbon				2039.74	1114.14	296.49	308.80	81.26				
Hardness CaCO3	14992	14508	14992	25727	21836	16820	16855	15609	14508	14992	14992	13541
Total Metals												
Aluminum Al	4.47	4.33	4.47	19.08	11.99	9.12	8.75	5.90	4.33	4.47	4.47	4.04
Antimony Sb	1.32	1.28	1.32	4.67	3.44	2.22	2.44	1.72	1.28	1.32	1.32	1.19
Arsenic As	0.39	0.38	0.39	0.69	0.59	0.47	0.47	0.43	0.38	0.39	0.39	0.36
Barium Ba	1.56	1.51	1.56	2.27	1.99	1.75	1.72	1.62	1.51	1.56	1.56	1.41
Beryllium Be	0.05	0.05	0.05	0.23	0.15	0.08	0.09	0.06	0.05	0.05	0.05	0.04
Bismuth Bi	1.23	1.19	1.23	4.55	3.31	2.10	2.31	1.62	1.19	1.23	1.23	1.11
Boron B	2.80	2.71	2.80	10.14	7.27	4.46	4.68	3.42	2.71	2.80	2.80	2.53
Cadmium Cd	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Calcium Ca	40484	39178	40484	42085	42121	41138	39969	40725	39178	40484	40484	36566
Chromium Cr	1.02	0.99	1.02	1.31	1.26	1.11	1.06	1.04	0.99	1.02	1.02	0.92
Cobalt Co	1.67	1.62	1.67	1.85	1.81	1.73	1.69	1.70	1.62	1.67	1.67	1.51
Copper Cu	1.46	1.41	1.46	1.83	1.69	1.52	1.49	1.48	1.41	1.46	1.46	1.32
Iron Fe	4.63	4.48	4.63	20.95	11.40	9.09	9.17	5.93	4.48	4.63	4.63	4.18
Lead Pb	0.05	0.05	0.05	0.13	0.10	0.07	0.07	0.06	0.05	0.05	0.05	0.04
Lithium Li	0.46	0.45	0.46	1.79	1.12	0.68	0.72	0.54	0.45	0.46	0.46	0.42
Magnesium Mg	1082	1047	1082	2810	2050	1445	1450	1199	1047	1082	1082	977
Manganese Mn	4.56	4.41	4.56	5.16	4.97	4.80	4.74	4.66	4.41	4.56	4.56	4.12
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	1.48	1.43	1.48	1.50	1.52	1.49	1.45	1.48	1.43	1.48	1.48	1.34
Nickel Ni	1.26	1.22	1.26	1.76	1.57	1.38	1.37	1.31	1.22	1.26	1.26	1.14
Phosphorus P	33	32	33	45	40	36	36	35	32	33	33	30
Potassium K	6696	6480	6696	7098	7021	6789	6623	6736	6480	6696	6696	6048
Selenium Se	0.04	0.04	0.04	0.21	0.12	0.06	0.07	0.05	0.04	0.04	0.04	0.03
Silicon SiO2	556	538	556	951	765	628	629	583	538	556	556	502
Silver Ag	0.01	0.01	0.01	0.06	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sodium Na	6353	6148	6353	11529	9373	7259	7287	6654	6148	6353	6353	5739
Strontium Sr	12	12	12	21	17	14	14	13	12	12	12	11
Tellurium Te	0.02	0.02	0.02	17.05	8.00	2.50	3.12	0.83	0.02	0.02	0.02	0.02
Thallium Tl	0.00	0.00	0.00	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.02	0.01	0.00	0.01	0.00				
Tin Sn	0.18	0.18	0.18	0.74	0.56	0.33	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.10	0.09	0.10	2.33	1.18	0.45	0.53	0.22	0.09	0.10	0.10	0.09
Uranium U	0.00	0.00	0.00	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.36	0.35	0.36	1.08	0.79	0.52	0.54	0.43	0.35	0.36	0.36	0.33
Zinc Zn	3.5	3.4	3.5	4.4	4.1	3.8	4.2	3.7	3.4	3.5	3.5	3.2
Zirconium Zr				2.03	1.00	0.33	0.42	0.12				

Table H 5-A-3
Scenario 5

Loadings to Tail Lake (kg/month)												
Date	Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter												
TDS	50662	49028	50662	85615	69392	55512	56305	52578	49028	50662	50662	45759
TSS				998	468	146	182	48				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate	1289	1247	1289	5587	3970	2351	2656	1766	1247	1289	1289	1164
Chloride	49110	47526	49110	81747	70595	57181	57990	52569	47526	49110	49110	44357
Total Ammonia	25	24	25	153	104	58	68	40	24	25	25	22
Nitrate	29	28	29	1036	654	292	365	147	28	29	29	26
Nitrite	64	62	64	86	79	71	70	67	62	64	64	58
Alkalinity				8315	4839	1310	1516	399				
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	24	22	22	21	21	21	21	21	19
Org. Carbon				1995.66	1092.60	291.01	303.23	79.85				
Hardness CaCO3				10976	6712	1795	2305	607				
Total Metals												
Aluminum Al	0.81	0.78	0.81	12.46	6.46	4.64	4.19	1.88	0.78	0.81	0.81	0.73
Antimony Sb	1.21	1.17	1.21	4.55	3.32	2.11	2.33	1.61	1.17	1.21	1.21	1.09
Arsenic As	0.03	0.03	0.03	0.27	0.18	0.08	0.10	0.05	0.03	0.03	0.03	0.02
Barium Ba	0.06	0.06	0.06	0.79	0.47	0.24	0.26	0.12	0.06	0.06	0.06	0.05
Beryllium Be	0.03	0.03	0.03	0.20	0.13	0.06	0.06	0.04	0.03	0.03	0.03	0.03
Bismuth Bi	1.21	1.17	1.21	4.52	3.28	2.08	2.29	1.60	1.17	1.21	1.21	1.09
Boron B	0.60	0.58	0.60	7.23	4.59	2.07	2.30	1.13	0.58	0.60	0.60	0.55
Cadmium Cd	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Calcium Ca	263	254	263	2950	1775	865	979	482	254	263	263	237
Chromium Cr	0.07	0.06	0.07	0.37	0.30	0.16	0.13	0.09	0.06	0.07	0.07	0.06
Cobalt Co	0.06	0.06	0.06	0.28	0.19	0.11	0.13	0.08	0.06	0.06	0.06	0.05
Copper Cu	0.03	0.03	0.03	0.42	0.24	0.09	0.10	0.05	0.03	0.03	0.03	0.03
Iron Fe	0.23	0.23	0.23	15.69	6.47	4.44	4.62	1.43	0.23	0.23	0.23	0.21
Lead Pb	0.01	0.01	0.01	0.08	0.05	0.03	0.03	0.02	0.01	0.01	0.01	0.01
Lithium Li	0.06	0.06	0.06	1.36	0.70	0.27	0.32	0.14	0.06	0.06	0.06	0.05
Magnesium Mg	121	117	121	1833	1065	475	510	235	117	121	121	110
Manganese Mn	0.16	0.15	0.16	0.88	0.56	0.39	0.48	0.26	0.15	0.16	0.16	0.14
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	0.01	0.01	0.01	0.08	0.05	0.02	0.03	0.02	0.01	0.01	0.01	0.01
Nickel Ni	0.12	0.12	0.12	0.64	0.43	0.24	0.26	0.17	0.12	0.12	0.12	0.11
Phosphorus P	23	22	23	33	29	25	25	24	22	23	23	21
Potassium K	25	24	25	626	342	116	163	64	24	25	25	23
Selenium Se	0.00	0.00	0.00	0.15	0.07	0.02	0.03	0.01	0.00	0.00	0.00	0.00
Silicon SiO2	10	9	10	383	196	73	89	33	9	10	10	9
Silver Ag	0.00	0.00	0.00	0.05	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Sodium Na	12	12	12	5273	2971	900	1129	307	12	12	12	11
Strontium Sr	0	0	0	9	5	2	2	1	0	0	0	0
Tellurium Te				16.65	7.82	2.43	3.04	0.80				
Thallium Tl	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn	0.18	0.18	0.18	0.73	0.55	0.33	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.06	0.06	0.06	2.24	1.11	0.40	0.48	0.18	0.06	0.06	0.06	0.05
Uranium U	0.00	0.00	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.18	0.18	0.18	0.87	0.59	0.33	0.36	0.24	0.18	0.18	0.18	0.16
Zinc Zn	0.2	0.2	0.2	1.1	0.8	0.5	0.9	0.4	0.2	0.2	0.2	0.2
Zirconium Zr				1.86	0.90	0.29	0.37	0.10				

Table H 5-A-3
Scenario 5

Loadings to Tail Lake (kg/month)												
Date	Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter												
TDS				36220	18557	4807	7214	1900				
TSS				988	464	144	180	48				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				796	484	137	224	63				
Chloride				9549	6186	1634	2224	586				
Total Ammonia				61	37	16	21	7				
Nitrate				470	291	122	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				8232	4794	1298	1503	396				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1975.65	1082.50	288.41	300.57	79.17				
Hardness CaCO3				10866	6650	1778	2284	602				
Total Metals												
Aluminum Al				9.72	4.45	3.32	2.76	0.85				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.16	0.10	0.04	0.05	0.01				
Barium Ba				0.56	0.31	0.13	0.14	0.04				
Beryllium Be				0.09	0.04	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				4.95	2.94	1.02	1.16	0.33				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				1957	1056	410	480	134				
Chromium Cr				0.14	0.13	0.05	0.01	0.00				
Cobalt Co				0.05	0.03	0.01	0.01	0.00				
Copper Cu				0.32	0.17	0.04	0.05	0.01				
Iron Fe				14.83	5.88	4.04	4.19	1.13				
Lead Pb				0.04	0.02	0.01	0.01	0.00				
Lithium Li				1.13	0.53	0.17	0.21	0.06				
Magnesium Mg				1369	730	265	278	74				
Manganese Mn				0.29	0.12	0.12	0.17	0.05				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.19	0.10	0.03	0.03	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				527	271	72	115	30				
Selenium Se				0.15	0.07	0.02	0.03	0.01				
Silicon SiO2				344	169	56	70	20				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				5176	2911	872	1096	289				
Strontium Sr				7	4	1	2	0				
Tellurium Te				16.48	7.74	2.41	3.01	0.79				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.05	0.06	0.02	0.02	0.01				
Titanium Ti				2.00	0.94	0.29	0.37	0.10				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.20	0.10	0.02	0.01	0.00				
Zinc Zn				0.4	0.2	0.1	0.5	0.1				
Zirconium Zr				1.84	0.90	0.29	0.37	0.10				

Table H 5-A-3
Scenario 5

Loadings to Tail Lake (kg/month)												
Date	Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter												
TDS				35951	18425	4773	7163	1887				
TSS				980	461	143	179	47				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				791	481	136	223	63				
Chloride				9478	6142	1623	2209	582				
Total Ammonia				61	37	16	21	7				
Nitrate				470	291	122	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				8171	4760	1289	1492	393				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1960.96	1074.80	286.37	298.46	78.62				
Hardness CaCO3				10785	6602	1766	2268	597				
Total Metals												
Aluminum Al				9.68	4.44	3.30	2.75	0.85				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.16	0.10	0.04	0.04	0.01				
Barium Ba				0.56	0.30	0.13	0.14	0.04				
Beryllium Be				0.09	0.04	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				4.92	2.92	1.02	1.15	0.33				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				1944	1050	408	477	133				
Chromium Cr				0.14	0.13	0.05	0.01	0.00				
Cobalt Co				0.05	0.03	0.01	0.01	0.00				
Copper Cu				0.32	0.17	0.04	0.05	0.01				
Iron Fe				14.73	5.84	4.01	4.16	1.12				
Lead Pb				0.04	0.02	0.01	0.01	0.00				
Lithium Li				1.12	0.53	0.17	0.21	0.06				
Magnesium Mg				1359	725	263	276	74				
Manganese Mn				0.28	0.12	0.12	0.17	0.05				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.19	0.10	0.03	0.03	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				523	270	71	114	30				
Selenium Se				0.15	0.07	0.02	0.03	0.01				
Silicon SiO2				342	168	55	70	20				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				5137	2890	866	1088	287				
Strontium Sr				7	4	1	2	0				
Tellurium Te				16.36	7.69	2.39	2.99	0.79				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.05	0.06	0.02	0.02	0.01				
Titanium Ti				1.98	0.93	0.29	0.36	0.10				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.20	0.10	0.02	0.01	0.00				
Zinc Zn				0.4	0.2	0.1	0.5	0.1				
Zirconium Zr				1.83	0.89	0.29	0.36	0.10				

Table H 5-A-3
Scenario 5

Loadings to Tail Lake (kg/month)												
Date	Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter												
TDS				35702	18302	4741	7115	1874				
TSS				974	458	142	178	47				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				786	478	136	222	63				
Chloride				9412	6101	1612	2194	578				
Total Ammonia				61	37	16	21	7				
Nitrate				470	291	122	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				8114	4728	1280	1482	390				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1947.40	1067.59	284.47	296.47	78.10				
Hardness CaCO3				10711	6558	1754	2253	594				
Total Metals												
Aluminum Al				9.64	4.43	3.29	2.74	0.85				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.16	0.10	0.04	0.04	0.01				
Barium Ba				0.55	0.30	0.13	0.14	0.04				
Beryllium Be				0.08	0.04	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				4.89	2.91	1.01	1.15	0.33				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				1933	1044	406	475	132				
Chromium Cr				0.14	0.13	0.05	0.01	0.00				
Cobalt Co				0.05	0.03	0.01	0.01	0.00				
Copper Cu				0.32	0.17	0.04	0.05	0.01				
Iron Fe				14.63	5.81	3.99	4.14	1.12				
Lead Pb				0.04	0.02	0.01	0.01	0.00				
Lithium Li				1.11	0.53	0.16	0.21	0.05				
Magnesium Mg				1349	720	261	275	73				
Manganese Mn				0.28	0.12	0.12	0.17	0.05				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.19	0.10	0.03	0.03	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				519	268	71	113	30				
Selenium Se				0.15	0.07	0.02	0.03	0.01				
Silicon SiO2				340	167	55	69	20				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				5102	2871	860	1081	285				
Strontium Sr				7	4	1	2	0				
Tellurium Te				16.25	7.64	2.38	2.97	0.78				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.05	0.06	0.02	0.02	0.01				
Titanium Ti				1.97	0.93	0.29	0.36	0.10				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.20	0.10	0.02	0.01	0.00				
Zinc Zn				0.4	0.2	0.1	0.5	0.1				
Zirconium Zr				1.82	0.88	0.29	0.36	0.10				

Table H 5-A-3
Scenario 5

Loadings to Tail Lake (kg/month)												
Date	Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter												
TDS				35468	18184	4711	7070	1862				
TSS				967	455	141	177	47				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				635	385	97	171	45				
Chloride				9351	6061	1602	2180	574				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				8061	4697	1272	1473	388				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1934.60	1060.71	282.65	294.58	77.60				
Hardness CaCO3				10640	6516	1743	2239	590				
Total Metals												
Aluminum Al				5.32	1.76	2.15	1.30	0.34				
Antimony Sb				0.04	0.04	0.03	0.04	0.01				
Arsenic As				0.06	0.04	0.01	0.01	0.00				
Barium Ba				0.54	0.29	0.13	0.14	0.04				
Beryllium Be				0.06	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.00	0.00	0.00	0.00				
Boron B				3.87	2.27	0.74	0.81	0.21				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				1670	882	338	388	102				
Chromium Cr				0.12	0.11	0.04	0.01	0.00				
Cobalt Co				0.03	0.02	0.00	0.01	0.00				
Copper Cu				0.29	0.15	0.03	0.04	0.01				
Iron Fe				13.54	5.15	3.70	3.78	0.99				
Lead Pb				0.02	0.01	0.00	0.00	0.00				
Lithium Li				1.09	0.51	0.16	0.20	0.05				
Magnesium Mg				1316	700	253	265	70				
Manganese Mn				0.26	0.11	0.11	0.16	0.04				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.17	0.08	0.02	0.02	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				509	262	69	110	29				
Selenium Se				0.13	0.06	0.02	0.02	0.00				
Silicon SiO2				290	136	42	53	14				
Silver Ag				0.03	0.02	0.00	0.00	0.00				
Sodium Na				5062	2849	853	1072	282				
Strontium Sr				7	4	1	2	0				
Tellurium Te				16.12	7.58	2.36	2.95	0.78				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th												
Tin Sn				0.03	0.05	0.01	0.02	0.00				
Titanium Ti				1.93	0.91	0.28	0.35	0.09				
Uranium U				0.02	0.01	0.00	0.00	0.00				
Vanadium V				0.15	0.07	0.01	0.00	0.00				
Zinc Zn				0.3	0.1	0.1	0.5	0.1				
Zirconium Zr				1.61	0.76	0.24	0.29	0.08				

Table H 5-A-3
Scenario 5

Loadings to Tail Lake (kg/month)												
Date	Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter												
TDS				35242	18069	4681	7026	1851				
TSS				961	452	140	176	46				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				631	382	96	170	45				
Chloride				9291	6023	1592	2166	571				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				8009	4668	1264	1464	386				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1922.27	1054.03	280.88	292.74	77.12				
Hardness CaCO3				10573	6475	1732	2225	586				
Total Metals												
Aluminum Al				5.29	1.75	2.14	1.29	0.34				
Antimony Sb				0.04	0.04	0.03	0.04	0.01				
Arsenic As				0.06	0.04	0.01	0.01	0.00				
Barium Ba				0.53	0.29	0.13	0.14	0.04				
Beryllium Be				0.06	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.00	0.00	0.00	0.00				
Boron B				3.84	2.26	0.74	0.80	0.21				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				1660	876	336	386	102				
Chromium Cr				0.12	0.11	0.04	0.01	0.00				
Cobalt Co				0.03	0.02	0.00	0.01	0.00				
Copper Cu				0.29	0.15	0.03	0.04	0.01				
Iron Fe				13.46	5.12	3.68	3.75	0.99				
Lead Pb				0.02	0.01	0.00	0.00	0.00				
Lithium Li				1.08	0.51	0.16	0.20	0.05				
Magnesium Mg				1307	696	251	263	69				
Manganese Mn				0.26	0.11	0.11	0.16	0.04				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.17	0.08	0.02	0.02	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				506	260	68	109	29				
Selenium Se				0.13	0.06	0.02	0.02	0.00				
Silicon SiO2				288	136	42	53	14				
Silver Ag				0.03	0.02	0.00	0.00	0.00				
Sodium Na				5030	2831	847	1066	281				
Strontium Sr				7	4	1	2	0				
Tellurium Te				16.02	7.53	2.34	2.93	0.77				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th												
Tin Sn				0.03	0.05	0.01	0.02	0.00				
Titanium Ti				1.92	0.90	0.28	0.35	0.09				
Uranium U				0.02	0.01	0.00	0.00	0.00				
Vanadium V				0.15	0.07	0.01	0.00	0.00				
Zinc Zn				0.3	0.1	0.1	0.5	0.1				
Zirconium Zr				1.60	0.75	0.23	0.29	0.08				

Table H 5-A-3
Scenario 5

Loadings to Tail Lake (kg/month)												
Date	Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter												
TDS				35021	17956	4652	6982	1839				
TSS				955	449	140	175	46				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				627	380	95	169	45				
Chloride				9233	5985	1582	2153	567				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				7959	4639	1256	1455	383				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1910.21	1047.43	279.13	290.93	76.64				
Hardness CaCO3				10506	6434	1721	2211	582				
Total Metals												
Aluminum Al				5.25	1.74	2.13	1.29	0.34				
Antimony Sb				0.04	0.04	0.03	0.04	0.01				
Arsenic As				0.06	0.04	0.01	0.01	0.00				
Barium Ba				0.53	0.29	0.13	0.13	0.04				
Beryllium Be				0.06	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.00	0.00	0.00	0.00				
Boron B				3.82	2.24	0.74	0.80	0.21				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				1649	871	334	383	101				
Chromium Cr				0.12	0.11	0.04	0.01	0.00				
Cobalt Co				0.03	0.01	0.00	0.01	0.00				
Copper Cu				0.29	0.15	0.03	0.04	0.01				
Iron Fe				13.37	5.09	3.66	3.73	0.98				
Lead Pb				0.02	0.01	0.00	0.00	0.00				
Lithium Li				1.07	0.50	0.16	0.20	0.05				
Magnesium Mg				1299	691	250	261	69				
Manganese Mn				0.25	0.10	0.11	0.16	0.04				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.17	0.08	0.02	0.02	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				503	259	68	109	29				
Selenium Se				0.13	0.06	0.02	0.02	0.00				
Silicon SiO2				287	135	42	52	14				
Silver Ag				0.03	0.01	0.00	0.00	0.00				
Sodium Na				4998	2813	842	1059	279				
Strontium Sr				7	4	1	2	0				
Tellurium Te				15.92	7.48	2.33	2.91	0.77				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th												
Tin Sn				0.03	0.04	0.01	0.02	0.00				
Titanium Ti				1.91	0.90	0.28	0.35	0.09				
Uranium U				0.02	0.01	0.00	0.00	0.00				
Vanadium V				0.15	0.07	0.01	0.00	0.00				
Zinc Zn				0.3	0.1	0.1	0.5	0.1				
Zirconium Zr				1.59	0.75	0.23	0.29	0.08				

Table H 5-A-3
Scenario 5

Loadings to Tail Lake (kg/month)												
Date	Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16	Year 10 Jan-17
Parameter												
TDS				34801	17843	4623	6939	1828				
TSS				949	446	139	173	46				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				623	378	95	168	44				
Chloride				9175	5948	1572	2140	564				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				7909	4609	1248	1446	381				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1898.25	1040.85	277.39	289.12	76.16				
Hardness CaCO3				10440	6394	1711	2197	579				
Total Metals												
Aluminum Al				5.22	1.72	2.11	1.28	0.34				
Antimony Sb				0.04	0.04	0.03	0.04	0.01				
Arsenic As				0.06	0.04	0.01	0.01	0.00				
Barium Ba				0.53	0.29	0.13	0.13	0.04				
Beryllium Be				0.06	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.00	0.00	0.00	0.00				
Boron B				3.80	2.23	0.73	0.79	0.21				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				1639	865	331	381	100				
Chromium Cr				0.12	0.11	0.04	0.01	0.00				
Cobalt Co				0.03	0.01	0.00	0.01	0.00				
Copper Cu				0.28	0.15	0.03	0.04	0.01				
Iron Fe				13.29	5.06	3.63	3.71	0.98				
Lead Pb				0.02	0.01	0.00	0.00	0.00				
Lithium Li				1.07	0.50	0.16	0.19	0.05				
Magnesium Mg				1291	687	248	260	68				
Manganese Mn				0.25	0.10	0.11	0.16	0.04				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.16	0.08	0.02	0.02	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				500	257	67	108	28				
Selenium Se				0.13	0.06	0.02	0.02	0.00				
Silicon SiO2				285	134	42	52	14				
Silver Ag				0.03	0.01	0.00	0.00	0.00				
Sodium Na				4967	2795	837	1052	277				
Strontium Sr				7	4	1	2	0				
Tellurium Te				15.82	7.43	2.31	2.89	0.76				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th												
Tin Sn				0.03	0.04	0.01	0.02	0.00				
Titanium Ti				1.90	0.89	0.28	0.35	0.09				
Uranium U				0.02	0.01	0.00	0.00	0.00				
Vanadium V				0.15	0.07	0.01	0.00	0.00				
Zinc Zn				0.3	0.1	0.1	0.5	0.1				
Zirconium Zr				1.58	0.74	0.23	0.29	0.08				

Table H-5-A-1
Scenario 5

OUTPUT SUMMARY							Fraction of CCME in Doris Creek (%)
Discharge rate		200000 m3/year					
Degradation Field(age)		Tail Lk Cu < CME Year		34			
		MMER	CCME	Tail Lake Year 2	Doris Creek Year 12	L'Roberts L Year 12	
Maximum Concentration							
pH			6 to 9	7 to 8	7 to 8	7 to 8	
TDS	mg/L			584	161	173	
TSS	mg/L			4.4	7.0	8.1	
Free CN	mg/L		0.005	0.0027	0.00003	0.00002	1%
Total CN	mg/L	1.0		0.026	0.002	0.002	
WAD CN	mg/L			0.0036	0.0000	0.0000	
CNO	mg/L			3.0	0.04	0.02	
SCN	mg/L			0.094	0.001	0.001	
Sulphate	mg/L			87	4.2	5.2	
Chloride	mg/L			418	75	73	
Total Ammonia	mg/L		0.97	1.06	0.024	0.013	2%
Nitrate	mg/L		2.9	5.3	0.09	0.05	3%
Nitrite	mg/L		0.018	0.42	0.007	0.005	41%
Alkalinity	mg/L			53	28	26	
OrthoPhosphate-P	mg/L			0.1584	0.0037	0.0025	
Phosphate-P	mg/L			0.1616	0.0255	0.0256	
Org. Carbon	mg/L			6.4	7.5	7.0	
Hardness CaCO3	mg/L			104	46	46	
Total Metals							
Aluminum Al	mg/L		0.1	0.12	0.08	0.25	81%
Antimony Sb	mg/L			0.0145	0.0030	0.0018	
Arsenic As	mg/L	0.5	0.005	0.00	0.0005	0.0005	10%
Barium Ba	mg/L			0.0101	0.0032	0.0052	
Beryllium Be	mg/L			0.00057	0.00002	0.00001	
Bismuth Bi	mg/L			0.01392	0.00029	0.00023	
Boron B	mg/L			0.031	0.034	0.030	
Cadmium Cd	mg/L		0.000038	0.000053	0.0000039	0.0000152	10%
Calcium Ca	mg/L			234	13	10	
Chromium Cr	mg/L		0.001	0.0062	0.001	0.001	73%
Cobalt Co	mg/L			0.0098	0.0010	0.0004	
Copper Cu	mg/L	0.3	0.002	0.009	0.0016	0.0019	81%
Iron Fe	mg/L		0.3	0.15	0.13	0.28	42%
Lead Pb	mg/L	0.2	0.002	0.00039	0.00007	0.00026	3%
Lithium Li	mg/L			0.0050	0.0029	0.0029	
Magnesium Mg	mg/L			8.9	7.3	7.3	
Manganese Mn	mg/L			0.027	0.021	0.024	
Mercury Hg	mg/L		0.0001	0.0000095	0.0000010	0.0000008	1%
Molybdenum Mo	mg/L		0.073	0.0085	0.00028	0.00028	0%
Nickel Ni	mg/L	0.5	0.025	0.008	0.0007	0.0007	3%
Phosphorus P	mg/L			0.237	0.027	0.026	
Potassium K	mg/L			39	3.3	3.0	
Selenium Se	mg/L		0.001	0.00084	0.00090	0.00083	90%
Silicon SiO2	mg/L			3.8	0.58	0.56	
Silver Ag	mg/L		0.0001	0.00011	0.0000065	0.0000055	6%
Sodium Na	mg/L			112	42	40	
Strontium Sr	mg/L			0.084	0.042	0.047	
Tellurium Te	mg/L			0.052	0.050	0.051	
Thallium Tl	mg/L		0.0008	0.000042	0.000030	0.002001	4%
Thorium Th	mg/L			0.000037	0.0000020	0.0000010	
Tin Sn	mg/L			0.00220	0.00043	0.00002	
Titanium Ti	mg/L			0.0118	0.0062	0.0063	
Uranium U	mg/L			0.000071	0.000040	0.000044	
Vanadium V	mg/L			0.0033	0.0006	0.0005	
Zinc Zn	mg/L	0.5	0.03	0.022	0.0034	0.0053	11%
Zirconium Zr	mg/L			0.0054	0.0050	0.0052	

Table H-5-A-2
Scenario 5

Water Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter													
TDS	mg/L				140	122	126	146	146				
TSS	mg/L				4.0	5.8	6.0	6.9	6.9				
Free CN	mg/L				0.00002	0.00000	0.00000	0.00000	0.00000				
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L				0.0000	0.0000	0.0000	0.0000	0.0000				
CNO	mg/L				0.02	0.01	0.01	0.01	0.01				
SCN	mg/L				0.000	0.000	0.000	0.000	0.000				
Sulphate	mg/L				3.0	3.0	3.2	3.4	3.4				
Chloride	mg/L				61	61	59	63	64				
Total Ammonia	mg/L				0.010	0.019	0.020	0.019	0.019				
Nitrate	mg/L				0.04	0.05	0.05	0.06	0.06				
Nitrite	mg/L				0.004	0.005	0.005	0.005	0.005				
Alkalinity	mg/L				27	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0011	0.0012	0.0012	0.0013	0.0014				
Phosphate-P	mg/L				0.0167	0.0181	0.0242	0.0199	0.0199				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				45	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0009	0.0029	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00005	0.00007	0.00008	0.00009	0.00010				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000034	0.0000035	0.0000030	0.0000031	0.0000031				
Calcium Ca	mg/L				9	9	8	8	8				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0002	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0016	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.5	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00018	0.00018	0.00021	0.00020	0.00020				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0005	0.0005				
Phosphorus P	mg/L				0.017	0.019	0.025	0.021	0.021				
Potassium K	mg/L				2.9	2.5	2.5	2.5	2.5				
Selenium Se	mg/L				0.00089	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.52	0.52	0.52	0.52	0.53				
Silver Ag	mg/L				0.0000026	0.0000030	0.0000027	0.0000027	0.0000027				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.040	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00040	0.00041	0.00041	0.00041	0.00041				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0010	0.0032	0.0029	0.0018	0.0018				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-5-A-2
Scenario 5

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter													
TDS	mg/L				143	125	129	148	149				
TSS	mg/L				4.0	5.8	6.0	6.9	6.9				
Free CN	mg/L				0.00003	0.00000	0.00000	0.00000	0.00000				
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L				0.0000	0.0000	0.0000	0.0000	0.0000				
CNO	mg/L				0.04	0.00	0.00	0.00	0.00				
SCN	mg/L				0.001	0.001	0.001	0.001	0.001				
Sulphate	mg/L				3.6	3.5	3.6	3.8	3.9				
Chloride	mg/L				63	63	61	65	65				
Total Ammonia	mg/L				0.014	0.024	0.019	0.018	0.018				
Nitrate	mg/L				0.08	0.08	0.08	0.09	0.09				
Nitrite	mg/L				0.007	0.005	0.005	0.005	0.005				
Alkalinity	mg/L				28	26	27	27	27				
OrthoPhosphate-P	mg/L				0.0019	0.0019	0.0019	0.0019	0.0020				
Phosphate-P	mg/L				0.0175	0.0189	0.0249	0.0205	0.0205				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	45	45				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0005	0.0009	0.0029	0.0006	0.0006				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0031	0.0032	0.0032				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00013	0.00014	0.00014	0.00014	0.00015				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000038	0.0000038	0.0000033	0.0000033	0.0000034				
Calcium Ca	mg/L				11	10	10	10	10				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0002	0.0010	0.0002	0.0002				
Copper Cu	mg/L				0.0013	0.0016	0.0013	0.0016	0.0016				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00007	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00023	0.00023	0.00026	0.00024	0.00024				
Nickel Ni	mg/L				0.0005	0.0006	0.0005	0.0005	0.0005				
Phosphorus P	mg/L				0.019	0.020	0.026	0.022	0.022				
Potassium K	mg/L				3.2	2.8	2.7	2.7	2.7				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.54	0.54	0.54	0.54	0.54				
Silver Ag	mg/L				0.0000029	0.0000032	0.0000029	0.0000029	0.0000030				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00041	0.00042	0.00042	0.00042	0.00042				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000027	0.000032	0.000040	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0011	0.0033	0.0030	0.0019	0.0019				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-5-A-2
Scenario 5

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter													
TDS	mg/L				145	126	130	150	150				
TSS	mg/L				4.0	5.8	6.0	6.9	6.9				
Free CN	mg/L				0.00002								
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L				0.0000								
CNO	mg/L				0.02								
SCN	mg/L				0.001	0.001	0.001	0.001	0.001				
Sulphate	mg/L				3.8	3.7	3.8	3.9	3.9				
Chloride	mg/L				64	64	62	66	66				
Total Ammonia	mg/L				0.012	0.018	0.017	0.016	0.016				
Nitrate	mg/L				0.09	0.09	0.09	0.09	0.09				
Nitrite	mg/L				0.006	0.004	0.004	0.003	0.003				
Alkalinity	mg/L				28	26	27	27	27				
OrthoPhosphate-P	mg/L				0.0023	0.0024	0.0023	0.0023	0.0024				
Phosphate-P	mg/L				0.0179	0.0193	0.0253	0.0209	0.0210				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	45	45				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0005	0.0010	0.0030	0.0006	0.0006				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0031	0.0032	0.0032				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00017	0.00018	0.00018	0.00018	0.00019				
Boron B	mg/L				0.034	0.023	0.023	0.023	0.023				
Cadmium Cd	mg/L				0.0000039	0.0000039	0.0000034	0.0000034	0.0000034				
Calcium Ca	mg/L				11	10	10	10	10				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0002	0.0010	0.0002	0.0002				
Copper Cu	mg/L				0.0013	0.0016	0.0013	0.0016	0.0016				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00003	0.00007	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00025	0.00025	0.00027	0.00025	0.00025				
Nickel Ni	mg/L				0.0005	0.0007	0.0005	0.0005	0.0005				
Phosphorus P	mg/L				0.019	0.021	0.027	0.022	0.022				
Potassium K	mg/L				3.2	2.8	2.8	2.7	2.7				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.55	0.55	0.54	0.54	0.54				
Silver Ag	mg/L				0.0000031	0.0000034	0.0000030	0.0000030	0.0000030				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00042	0.00042	0.00042	0.00042	0.00042				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000027	0.000032	0.000040	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0012	0.0034	0.0031	0.0019	0.0019				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-5-A-2
Scenario 5

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter													
TDS	mg/L				145	127	130	150	150				
TSS	mg/L				4.0	5.8	6.0	6.9	6.9				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.001	0.001	0.001	0.001	0.001				
Sulphate	mg/L				3.7	3.6	3.7	3.8	3.8				
Chloride	mg/L				65	65	62	66	66				
Total Ammonia	mg/L				0.009	0.011	0.017	0.016	0.016				
Nitrate	mg/L				0.09	0.09	0.09	0.09	0.09				
Nitrite	mg/L				0.003	0.003	0.003	0.003	0.003				
Alkalinity	mg/L				28	26	27	27	27				
OrthoPhosphate-P	mg/L				0.0026	0.0025	0.0024	0.0024	0.0024				
Phosphate-P	mg/L				0.0182	0.0195	0.0255	0.0210	0.0210				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	45	45				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0005	0.0010	0.0030	0.0006	0.0006				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0031	0.0032	0.0032				
Beryllium Be	mg/L				0.00002	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00020	0.00019	0.00018	0.00018	0.00018				
Boron B	mg/L				0.034	0.023	0.023	0.023	0.023				
Cadmium Cd	mg/L				0.0000038	0.0000038	0.0000033	0.0000033	0.0000033				
Calcium Ca	mg/L				11	10	10	9	9				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0002	0.0010	0.0002	0.0002				
Copper Cu	mg/L				0.0013	0.0016	0.0013	0.0016	0.0016				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00007	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00024	0.00023	0.00026	0.00023	0.00023				
Nickel Ni	mg/L				0.0005	0.0006	0.0005	0.0005	0.0005				
Phosphorus P	mg/L				0.020	0.021	0.027	0.022	0.022				
Potassium K	mg/L				3.2	2.8	2.7	2.7	2.7				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.54	0.54	0.54	0.54	0.54				
Silver Ag	mg/L				0.0000032	0.0000034	0.0000031	0.0000031	0.0000031				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00042	0.00042	0.00042	0.00042	0.00042				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000027	0.000032	0.000040	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0011	0.0034	0.0030	0.0019	0.0019				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-5-A-2
Scenario 5

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter													
TDS	mg/L				144	126	129	149	149				
TSS	mg/L				4.0	5.8	6.0	6.9	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.001	0.001	0.001	0.001	0.001				
Sulphate	mg/L				3.6	3.5	3.6	3.7	3.7				
Chloride	mg/L				64	64	62	66	66				
Total Ammonia	mg/L				0.008	0.011	0.017	0.016	0.016				
Nitrate	mg/L				0.08	0.08	0.08	0.08	0.08				
Nitrite	mg/L				0.003	0.003	0.003	0.003	0.003				
Alkalinity	mg/L				28	26	27	27	27				
OrthoPhosphate-P	mg/L				0.0024	0.0023	0.0022	0.0022	0.0022				
Phosphate-P	mg/L				0.0180	0.0193	0.0253	0.0208	0.0208				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0005	0.0010	0.0030	0.0006	0.0006				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0031	0.0031	0.0031				
Beryllium Be	mg/L				0.00002	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00018	0.00017	0.00016	0.00016	0.00016				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.023				
Cadmium Cd	mg/L				0.0000038	0.0000038	0.0000033	0.0000033	0.0000033				
Calcium Ca	mg/L				10	10	9	9	9				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0002	0.0010	0.0002	0.0002				
Copper Cu	mg/L				0.0013	0.0016	0.0013	0.0016	0.0016				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00007	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00023	0.00022	0.00025	0.00023	0.00023				
Nickel Ni	mg/L				0.0005	0.0006	0.0005	0.0005	0.0005				
Phosphorus P	mg/L				0.019	0.021	0.026	0.022	0.022				
Potassium K	mg/L				3.1	2.7	2.7	2.6	2.6				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.54	0.54	0.54	0.54	0.54				
Silver Ag	mg/L				0.0000032	0.0000034	0.0000030	0.0000031	0.0000031				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00042	0.00042	0.00042	0.00042	0.00042				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000027	0.000032	0.000040	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0011	0.0033	0.0030	0.0019	0.0019				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-5-A-2
Scenario 5

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter													
TDS	mg/L				144	125	129	149	149				
TSS	mg/L				4.0	5.8	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.001	0.001	0.001	0.001	0.001				
Sulphate	mg/L				3.5	3.4	3.5	3.6	3.6				
Chloride	mg/L				64	64	61	65	65				
Total Ammonia	mg/L				0.005	0.008	0.014	0.013	0.013				
Nitrate	mg/L				0.05	0.05	0.05	0.05	0.05				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				28	26	27	27	27				
OrthoPhosphate-P	mg/L				0.0022	0.0022	0.0021	0.0021	0.0021				
Phosphate-P	mg/L				0.0178	0.0191	0.0251	0.0207	0.0207				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0005	0.0009	0.0029	0.0006	0.0006				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00016	0.00015	0.00015	0.00015	0.00015				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000030	0.0000030	0.0000024	0.0000024	0.0000024				
Calcium Ca	mg/L				10	9	9	9	9				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0002	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0013	0.0016	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00022	0.00021	0.00024	0.00022	0.00022				
Nickel Ni	mg/L				0.0005	0.0006	0.0005	0.0005	0.0005				
Phosphorus P	mg/L				0.019	0.020	0.026	0.021	0.021				
Potassium K	mg/L				3.1	2.7	2.7	2.6	2.6				
Selenium Se	mg/L				0.00089	0.00057	0.00062	0.00055	0.00055				
Silicon SiO2	mg/L				0.53	0.53	0.53	0.53	0.53				
Silver Ag	mg/L				0.0000021	0.0000023	0.0000019	0.0000020	0.0000020				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000000	0.000000	0.000000	0.000000	0.000000				
Tin Sn	mg/L				0.00042	0.00042	0.00041	0.00041	0.00041				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000025	0.000030	0.000038	0.000032	0.000032				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0011	0.0033	0.0030	0.0018	0.0018				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-5-A-2
Scenario 5

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter													
TDS	mg/L				144	125	128	148	148				
TSS	mg/L				4.0	5.8	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.001	0.001	0.001	0.001	0.001				
Sulphate	mg/L				3.4	3.3	3.4	3.5	3.5				
Chloride	mg/L				63	63	61	65	65				
Total Ammonia	mg/L				0.005	0.008	0.014	0.013	0.013				
Nitrate	mg/L				0.04	0.04	0.04	0.04	0.04				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				28	26	27	27	27				
OrthoPhosphate-P	mg/L				0.0020	0.0020	0.0020	0.0019	0.0019				
Phosphate-P	mg/L				0.0176	0.0190	0.0250	0.0205	0.0205				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0005	0.0009	0.0029	0.0006	0.0006				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00014	0.00014	0.00014	0.00014	0.00014				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000029	0.0000029	0.0000024	0.0000024	0.0000024				
Calcium Ca	mg/L				10	9	9	9	9				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0002	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0013	0.0016	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00021	0.00021	0.00023	0.00021	0.00021				
Nickel Ni	mg/L				0.0005	0.0006	0.0005	0.0005	0.0005				
Phosphorus P	mg/L				0.018	0.020	0.026	0.021	0.021				
Potassium K	mg/L				3.1	2.7	2.6	2.6	2.6				
Selenium Se	mg/L				0.00089	0.00057	0.00062	0.00055	0.00055				
Silicon SiO2	mg/L				0.52	0.53	0.52	0.52	0.52				
Silver Ag	mg/L				0.0000021	0.0000023	0.0000019	0.0000019	0.0000019				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000000	0.000000	0.000000	0.000000	0.000000				
Tin Sn	mg/L				0.00041	0.00041	0.00041	0.00041	0.00041				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000025	0.000030	0.000038	0.000031	0.000031				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0011	0.0033	0.0030	0.0018	0.0018				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-5-A-2
Scenario 5

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter													
TDS	mg/L				143	125	128	148	148				
TSS	mg/L				4.0	5.8	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.001	0.001	0.001	0.001	0.001				
Sulphate	mg/L				3.4	3.3	3.4	3.5	3.5				
Chloride	mg/L				63	63	61	65	65				
Total Ammonia	mg/L				0.005	0.008	0.014	0.013	0.013				
Nitrate	mg/L				0.03	0.03	0.03	0.03	0.03				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				28	26	27	27	27				
OrthoPhosphate-P	mg/L				0.0019	0.0019	0.0018	0.0018	0.0018				
Phosphate-P	mg/L				0.0175	0.0189	0.0249	0.0204	0.0204				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0005	0.0009	0.0029	0.0006	0.0006				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00013	0.00013	0.00013	0.00013	0.00013				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000029	0.0000029	0.0000024	0.0000024	0.0000024				
Calcium Ca	mg/L				10	9	9	9	9				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0002	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0016	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00021	0.00020	0.00023	0.00021	0.00021				
Nickel Ni	mg/L				0.0005	0.0006	0.0005	0.0005	0.0005				
Phosphorus P	mg/L				0.018	0.019	0.025	0.021	0.021				
Potassium K	mg/L				3.0	2.6	2.6	2.5	2.5				
Selenium Se	mg/L				0.00089	0.00057	0.00062	0.00055	0.00055				
Silicon SiO2	mg/L				0.52	0.52	0.52	0.52	0.52				
Silver Ag	mg/L				0.0000021	0.0000023	0.0000019	0.0000019	0.0000019				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000000	0.000000	0.000000	0.000000	0.000000				
Tin Sn	mg/L				0.00041	0.00041	0.00041	0.00041	0.00041				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000025	0.000030	0.000038	0.000031	0.000031				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0010	0.0033	0.0029	0.0018	0.0018				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-5-A-2
Scenario 5

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter													
TDS	mg/L				143	124	128	148	148				
TSS	mg/L				4.0	5.8	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.001	0.001	0.000	0.000	0.000				
Sulphate	mg/L				3.3	3.2	3.3	3.5	3.5				
Chloride	mg/L				63	63	61	65	65				
Total Ammonia	mg/L				0.005	0.008	0.014	0.013	0.013				
Nitrate	mg/L				0.03	0.03	0.03	0.03	0.03				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				28	26	27	27	27				
OrthoPhosphate-P	mg/L				0.0018	0.0018	0.0017	0.0017	0.0017				
Phosphate-P	mg/L				0.0174	0.0188	0.0248	0.0203	0.0203				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0005	0.0009	0.0029	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00012	0.00012	0.00012	0.00012	0.00012				
Boron B	mg/L				0.034	0.022	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000029	0.0000028	0.0000023	0.0000023	0.0000023				
Calcium Ca	mg/L				10	9	9	8	8				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0002	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0016	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00020	0.00020	0.00023	0.00020	0.00020				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0005	0.0005				
Phosphorus P	mg/L				0.018	0.019	0.025	0.021	0.021				
Potassium K	mg/L				3.0	2.6	2.6	2.5	2.5				
Selenium Se	mg/L				0.00089	0.00057	0.00062	0.00055	0.00055				
Silicon SiO2	mg/L				0.52	0.52	0.52	0.52	0.52				
Silver Ag	mg/L				0.0000020	0.0000022	0.0000019	0.0000019	0.0000019				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000000	0.000000	0.000000	0.000000	0.000000				
Tin Sn	mg/L				0.00041	0.00041	0.00041	0.00041	0.00041				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000025	0.000030	0.000038	0.000031	0.000031				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0010	0.0033	0.0029	0.0018	0.0018				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-5-A-2
Scenario 5

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16
Parameter												
TDS	mg/L				143	124	128	147	147			
TSS	mg/L				4.0	5.8	6.0	7.0	7.0			
Free CN	mg/L											
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002			
WAD CN	mg/L											
CNO	mg/L											
SCN	mg/L				0.000	0.000	0.000	0.000	0.000			
Sulphate	mg/L				3.3	3.2	3.3	3.4	3.4			
Chloride	mg/L				63	62	60	64	64			
Total Ammonia	mg/L				0.005	0.008	0.014	0.013	0.013			
Nitrate	mg/L				0.02	0.02	0.02	0.02	0.02			
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002			
Alkalinity	mg/L				28	26	27	27	27			
OrthoPhosphate-P	mg/L				0.0017	0.0017	0.0017	0.0017	0.0017			
Phosphate-P	mg/L				0.0173	0.0187	0.0247	0.0202	0.0202			
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0			
Hardness CaCO3	mg/L				46	43	43	44	44			
Total Metals												
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07			
Antimony Sb	mg/L				0.0004	0.0009	0.0029	0.0005	0.0005			
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004			
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031			
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001			
Bismuth Bi	mg/L				0.00012	0.00011	0.00011	0.00011	0.00011			
Boron B	mg/L				0.034	0.022	0.023	0.022	0.022			
Cadmium Cd	mg/L				0.0000028	0.0000028	0.0000023	0.0000023	0.0000023			
Calcium Ca	mg/L				10	9	9	8	8			
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000			
Cobalt Co	mg/L				0.0001	0.0002	0.0009	0.0001	0.0001			
Copper Cu	mg/L				0.0012	0.0016	0.0013	0.0015	0.0015			
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09			
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004			
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028			
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5			
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010			
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006			
Molybdenum Mo	mg/L				0.00020	0.00019	0.00022	0.00020	0.00020			
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0005	0.0005			
Phosphorus P	mg/L				0.018	0.019	0.025	0.021	0.021			
Potassium K	mg/L				3.0	2.6	2.6	2.5	2.5			
Selenium Se	mg/L				0.00089	0.00057	0.00062	0.00055	0.00055			
Silicon SiO2	mg/L				0.52	0.52	0.52	0.52	0.52			
Silver Ag	mg/L				0.0000020	0.0000022	0.0000018	0.0000019	0.0000019			
Sodium Na	mg/L				39	33	34	32	32			
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040			
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050			
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030			
Thorium Th	mg/L				0.000000	0.000000	0.000000	0.000000	0.000000			
Tin Sn	mg/L				0.00041	0.00041	0.00041	0.00041	0.00041			
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060			
Uranium U	mg/L				0.000025	0.000030	0.000038	0.000031	0.000031			
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002			
Zinc Zn	mg/L				0.0010	0.0032	0.0029	0.0018	0.0018			
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050			

Table H 5-A-3
Scenario 5

Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)

Date	Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter												
TDS				1020562	551397	239701	355670	124407				
TSS				28919	26324	11327	16906	5901				
Free CN				0.12	0.02	0.01	0.01	0.00				
Total CN				16	9	4	5	2				
WAD CN				0.16	0.03	0.01	0.02	0.01				
CNO				133	23	10	13	4				
SCN				2	1	1	1	0				
Sulphate				22008	13582	6046	8213	2919				
Chloride				441825	275609	112678	154352	54062				
Total Ammonia				76	84	37	45	16				
Nitrate				300	225	104	143	54				
Nitrite				32	23	9	12	4				
Alkalinity				199614	114598	51372	64616	22576				
OrthoPhosphate-P				8	5	2	3	1				
Phosphate-P				121	82	46	48	17				
Org. Carbon				39811	23056	14180	12134	4235				
Hardness CaCO3				330321	193065	80946	107356	37520				
Total Metals												
Aluminum Al				245	271	154	176	61				
Antimony Sb				2.8	3.9	5.5	1.3	0.4				
Arsenic As				3.6	1.9	0.7	0.9	0.3				
Barium Ba				21	14	6	8	3				
Beryllium Be				0.08	0.04	0.02	0.02	0.01				
Bismuth Bi				0.38	0.33	0.16	0.22	0.08				
Boron B				249	102	44	55	19				
Cadmium Cd				0.02	0.02	0.01	0.01	0.00				
Calcium Ca				65896	38683	16074	20252	7206				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.54	0.77	1.75	0.29	0.11				
Copper Cu				9	7	2	4	1				
Iron Fe				370	560	160	219	76				
Lead Pb				0.16	0.29	0.08	0.10	0.03				
Lithium Li				20	13	5	7	2				
Magnesium Mg				52833	29518	12556	15738	5497				
Manganese Mn				48	93	25	25	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.30	0.81	0.40	0.48	0.17				
Nickel Ni				3.09	2.68	0.94	1.14	0.40				
Phosphorus P				126	85	48	50	18				
Potassium K				21095	11426	4814	6065	2139				
Selenium Se				6.50	2.58	1.18	1.35	0.47				
Silicon SiO2				3752	2344	990	1273	446				
Silver Ag				0.02	0.01	0.01	0.01	0.00				
Sodium Na				284077	148733	65139	77982	27237				
Strontium Sr				294	189	68	97	34				
Tellurium Te				362	225	95	121	42				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				2.93	1.83	0.77	0.99	0.35				
Titanium Ti				43	27	11	15	5				
Uranium U				0.19	0.14	0.08	0.08	0.03				
Vanadium V				4.06	0.29	0.48	0.39	0.14				
Zinc Zn				7.01	14.52	5.53	4.36	1.54				
Zirconium Zr				36	23	10	12	4				

Table H 5-A-3
Scenario 5**Solute Loadings in DSolute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter												
TDS				1043084	564099	244514	361555	126381				
TSS				28976	26351	11337	16919	5905				
Free CN				0.23	0.01	0.01	0.01	0.00				
Total CN				17	9	4	5	2				
WAD CN				0.31	0.02	0.01	0.01	0.00				
CNO				255	15	8	10	3				
SCN				6	4	2	2	1				
Sulphate				26159	15938	6935	9298	3283				
Chloride				456877	284061	115856	158232	55362				
Total Ammonia				102	107	36	44	15				
Nitrate				549	375	160	211	77				
Nitrite				54	22	9	11	4				
Alkalinity				201596	115688	51784	65121	22744				
OrthoPhosphate-P				14	9	4	5	2				
Phosphate-P				127	85	47	50	17				
Org. Carbon				39827	23054	14179	12133	4235				
Hardness CaCO3				334560	195434	81841	108452	37887				
Total Metals												
Aluminum Al				247	272	154	176	62				
Antimony Sb				3.3	4.2	5.6	1.4	0.5				
Arsenic As				3.7	2.0	0.8	1.0	0.3				
Barium Ba				21	15	6	8	3				
Beryllium Be				0.10	0.05	0.02	0.03	0.01				
Bismuth Bi				0.91	0.62	0.27	0.35	0.13				
Boron B				250	102	44	55	19				
Cadmium Cd				0.03	0.02	0.01	0.01	0.00				
Calcium Ca				77071	45072	18492	23205	8198				
Chromium Cr				5	1	1	1	0				
Cobalt Co				1.01	1.04	1.85	0.42	0.15				
Copper Cu				9	7	3	4	1				
Iron Fe				372	561	161	219	77				
Lead Pb				0.17	0.30	0.08	0.10	0.04				
Lithium Li				21	13	5	7	2				
Magnesium Mg				53165	29700	12625	15822	5525				
Manganese Mn				49	94	25	25	9				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.70	1.05	0.49	0.58	0.21				
Nickel Ni				3.46	2.89	1.01	1.24	0.44				
Phosphorus P				136	91	50	53	19				
Potassium K				22938	12479	5212	6552	2303				
Selenium Se				6.52	2.59	1.18	1.36	0.47				
Silicon SiO2				3912	2434	1024	1314	460				
Silver Ag				0.02	0.01	0.01	0.01	0.00				
Sodium Na				285877	149735	65519	78446	27392				
Strontium Sr				298	191	69	98	34				
Tellurium Te				362	225	95	121	42				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				3.01	1.87	0.79	1.01	0.35				
Titanium Ti				43	27	11	15	5				
Uranium U				0.19	0.14	0.08	0.08	0.03				
Vanadium V				4.20	0.36	0.51	0.42	0.15				
Zinc Zn				8.04	15.10	5.75	4.63	1.63				
Zirconium Zr				36	23	10	12	4				

Table H 5-A-3
Scenario 5**Solute Loadings in DSolute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter												
TDS				1054101	570429	246909	364347	127260				
TSS				28999	26361	11341	16922	5906				
Free CN				0.12								
Total CN				16	9	4	5	2				
WAD CN				0.16								
CNO				129								
SCN				8	5	2	2	1				
Sulphate				27689	16705	7177	9509	3322				
Chloride				465526	289296	117946	160851	56258				
Total Ammonia				86	79	33	40	14				
Nitrate				658	425	175	227	80				
Nitrite				46	19	8	7	2				
Alkalinity				202301	116021	51884	65198	22753				
OrthoPhosphate-P				17	11	4	6	2				
Phosphate-P				131	87	48	51	18				
Org. Carbon				39841	23059	14181	12136	4236				
Hardness CaCO3				336037	196137	82050	108609	37902				
Total Metals												
Aluminum Al				248	272	154	177	62				
Antimony Sb				3.6	4.4	5.6	1.5	0.5				
Arsenic As				3.7	2.0	0.8	1.0	0.3				
Barium Ba				21	15	6	8	3				
Beryllium Be				0.11	0.06	0.02	0.03	0.01				
Bismuth Bi				1.22	0.80	0.34	0.44	0.16				
Boron B				251	103	44	55	19				
Cadmium Cd				0.03	0.02	0.01	0.01	0.00				
Calcium Ca				80850	46890	19023	23585	8226				
Chromium Cr				5	1	1	1	0				
Cobalt Co				1.18	1.12	1.87	0.44	0.15				
Copper Cu				9	7	3	4	1				
Iron Fe				373	561	161	219	77				
Lead Pb				0.18	0.31	0.08	0.10	0.04				
Lithium Li				21	13	5	7	2				
Magnesium Mg				53297	29765	12646	15842	5529				
Manganese Mn				50	94	26	25	9				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.84	1.11	0.51	0.60	0.21				
Nickel Ni				3.60	2.96	1.04	1.26	0.44				
Phosphorus P				141	94	51	54	19				
Potassium K				23560	12778	5299	6614	2307				
Selenium Se				6.52	2.59	1.18	1.36	0.47				
Silicon SiO2				3969	2461	1032	1321	461				
Silver Ag				0.02	0.02	0.01	0.01	0.00				
Sodium Na				286508	150035	65608	78514	27399				
Strontium Sr				299	192	69	98	34				
Tellurium Te				362	225	95	121	42				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				3.06	1.90	0.80	1.03	0.36				
Titanium Ti				44	27	11	15	5				
Uranium U				0.19	0.14	0.08	0.08	0.03				
Vanadium V				4.26	0.39	0.52	0.44	0.15				
Zinc Zn				8.41	15.28	5.81	4.68	1.63				
Zirconium Zr				36	23	10	12	4				

Table H 5-A-3
Scenario 5**Solute Loadings in DSolute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter												
TDS				1056779	571477	247162	364381	127167				
TSS				29000	26361	11341	16923	5906				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				7	4	2	2	1				
Sulphate				26955	16218	6984	9258	3231				
Chloride				470701	291532	118562	161292	56287				
Total Ammonia				62	51	33	39	14				
Nitrate				636	398	163	208	73				
Nitrite				25	12	5	6	2				
Alkalinity				201919	115790	51802	65098	22720				
OrthoPhosphate-P				19	11	5	6	2				
Phosphate-P				132	88	48	51	18				
Org. Carbon				39871	23074	14188	12145	4239				
Hardness CaCO3				335108	195585	81850	108365	37819				
Total Metals												
Aluminum Al				248	272	154	177	62				
Antimony Sb				3.8	4.4	5.7	1.5	0.5				
Arsenic As				3.7	2.0	0.8	1.0	0.3				
Barium Ba				21	15	6	8	3				
Beryllium Be				0.11	0.06	0.02	0.03	0.01				
Bismuth Bi				1.42	0.86	0.35	0.44	0.15				
Boron B				251	103	44	55	19				
Cadmium Cd				0.03	0.02	0.01	0.01	0.00				
Calcium Ca				77939	45174	18388	22801	7957				
Chromium Cr				5	1	1	1	0				
Cobalt Co				1.07	1.05	1.85	0.41	0.14				
Copper Cu				9	7	3	4	1				
Iron Fe				372	561	161	219	77				
Lead Pb				0.18	0.31	0.08	0.10	0.04				
Lithium Li				21	13	5	7	2				
Magnesium Mg				53268	29742	12637	15829	5524				
Manganese Mn				49	94	25	25	9				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.73	1.05	0.49	0.57	0.20				
Nickel Ni				3.53	2.92	1.02	1.24	0.43				
Phosphorus P				142	94	51	54	19				
Potassium K				23077	12493	5195	6485	2263				
Selenium Se				6.52	2.59	1.18	1.36	0.47				
Silicon SiO2				3936	2441	1025	1311	458				
Silver Ag				0.02	0.02	0.01	0.01	0.00				
Sodium Na				286123	149805	65525	78413	27365				
Strontium Sr				299	191	69	98	34				
Tellurium Te				362	225	95	121	42				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				3.09	1.91	0.80	1.03	0.36				
Titanium Ti				44	27	11	15	5				
Uranium U				0.19	0.14	0.08	0.08	0.03				
Vanadium V				4.28	0.40	0.52	0.44	0.15				
Zinc Zn				8.21	15.16	5.76	4.62	1.61				
Zirconium Zr				36	23	10	12	4				

Table H 5-A-3
Scenario 5**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter												
TDS				1051894	568530	246048	362984	126680				
TSS				29005	26363	11342	16924	5906				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				6	4	1	2	1				
Sulphate				26173	15751	6806	9035	3153				
Chloride				466697	289133	117651	160149	55890				
Total Ammonia				60	51	33	39	14				
Nitrate				579	359	148	189	66				
Nitrite				19	12	5	6	2				
Alkalinity				201704	115656	51752	65036	22698				
OrthoPhosphate-P				17	11	4	5	2				
Phosphate-P				131	87	48	51	18				
Org. Carbon				39899	23090	14194	12152	4241				
Hardness CaCO3				334544	195240	81720	108203	37763				
Total Metals												
Aluminum Al				248	272	154	177	62				
Antimony Sb				3.7	4.4	5.6	1.4	0.5				
Arsenic As				3.7	2.0	0.8	1.0	0.3				
Barium Ba				21	14	6	8	3				
Beryllium Be				0.11	0.06	0.02	0.03	0.01				
Bismuth Bi				1.28	0.78	0.31	0.40	0.14				
Boron B				251	103	44	55	19				
Cadmium Cd				0.03	0.02	0.01	0.01	0.00				
Calcium Ca				75956	43988	17938	22236	7760				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.98	1.00	1.83	0.38	0.13				
Copper Cu				9	7	3	4	1				
Iron Fe				372	561	161	219	77				
Lead Pb				0.18	0.30	0.08	0.10	0.04				
Lithium Li				21	13	5	7	2				
Magnesium Mg				53228	29716	12627	15818	5520				
Manganese Mn				49	94	25	25	9				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.66	1.01	0.47	0.55	0.19				
Nickel Ni				3.47	2.88	1.00	1.22	0.42				
Phosphorus P				140	93	50	54	19				
Potassium K				22753	12299	5121	6392	2231				
Selenium Se				6.52	2.59	1.18	1.36	0.47				
Silicon SiO2				3913	2427	1020	1305	455				
Silver Ag				0.02	0.02	0.01	0.01	0.00				
Sodium Na				285891	149662	65472	78346	27342				
Strontium Sr				298	191	69	98	34				
Tellurium Te				362	225	95	121	42				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				3.07	1.90	0.80	1.02	0.36				
Titanium Ti				44	27	11	15	5				
Uranium U				0.20	0.14	0.08	0.08	0.03				
Vanadium V				4.25	0.38	0.51	0.43	0.15				
Zinc Zn				8.04	15.06	5.72	4.57	1.59				
Zirconium Zr				37	23	10	12	4				

Table H 5-A-3
Scenario 5**Solute Loadings in DSolute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter												
TDS				1047962	566151	245141	361844	126282				
TSS				29008	26365	11342	16925	5906				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				5	3	1	2	1				
Sulphate				25367	15264	6616	8794	3069				
Chloride				463474	287196	116910	159216	55565				
Total Ammonia				36	36	26	31	11				
Nitrate				339	212	86	111	39				
Nitrite				14	9	4	5	2				
Alkalinity				201531	115547	51711	64985	22680				
OrthoPhosphate-P				16	10	4	5	2				
Phosphate-P				130	86	48	50	18				
Org. Carbon				39922	23103	14199	12159	4244				
Hardness CaCO3				334091	194962	81615	108071	37716				
Total Metals												
Aluminum Al				243	269	153	175	61				
Antimony Sb				3.6	4.3	5.6	1.4	0.5				
Arsenic As				3.6	1.9	0.7	0.9	0.3				
Barium Ba				21	14	6	8	3				
Beryllium Be				0.08	0.04	0.02	0.02	0.01				
Bismuth Bi				1.14	0.69	0.28	0.36	0.12				
Boron B				250	102	44	54	19				
Cadmium Cd				0.02	0.01	0.00	0.01	0.00				
Calcium Ca				74057	42842	17492	21673	7564				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.89	0.94	1.80	0.35	0.12				
Copper Cu				9	7	3	4	1				
Iron Fe				371	561	160	219	76				
Lead Pb				0.15	0.29	0.08	0.09	0.03				
Lithium Li				21	13	5	7	2				
Magnesium Mg				53165	29677	12612	15798	5513				
Manganese Mn				49	94	25	25	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.60	0.97	0.46	0.53	0.19				
Nickel Ni				3.39	2.83	0.98	1.19	0.42				
Phosphorus P				135	90	49	52	18				
Potassium K				22484	12138	5059	6314	2204				
Selenium Se				6.50	2.57	1.17	1.35	0.47				
Silicon SiO2				3837	2380	1000	1280	447				
Silver Ag				0.02	0.01	0.00	0.00	0.00				
Sodium Na				285696	149542	65426	78289	27322				
Strontium Sr				298	191	69	98	34				
Tellurium Te				363	225	95	121	42				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.00	0.00	0.00	0.00	0.00				
Tin Sn				3.03	1.88	0.79	1.01	0.35				
Titanium Ti				44	27	11	15	5				
Uranium U				0.18	0.14	0.07	0.08	0.03				
Vanadium V				4.18	0.34	0.50	0.40	0.14				
Zinc Zn				7.78	14.90	5.66	4.49	1.57				
Zirconium Zr				36	23	9	12	4				

Table H 5-A-3
Scenario 5**Solute Loadings in DSolute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter												
TDS				1044739	564196	244390	360898	125952				
TSS				29012	26366	11343	16926	5907				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				5	3	1	1	1				
Sulphate				24851	14952	6495	8642	3016				
Chloride				460832	285604	116296	158442	55295				
Total Ammonia				36	36	26	31	11				
Nitrate				296	181	73	93	33				
Nitrite				14	9	4	5	2				
Alkalinity				201390	115458	51677	64943	22665				
OrthoPhosphate-P				15	9	4	5	2				
Phosphate-P				128	86	48	50	17				
Org. Carbon				39941	23113	14203	12164	4245				
Hardness CaCO3				333720	194733	81528	107961	37678				
Total Metals												
Aluminum Al				242	269	153	175	61				
Antimony Sb				3.5	4.2	5.6	1.4	0.5				
Arsenic As				3.5	1.9	0.7	0.9	0.3				
Barium Ba				21	14	6	8	3				
Beryllium Be				0.08	0.04	0.02	0.02	0.01				
Bismuth Bi				1.04	0.64	0.26	0.33	0.11				
Boron B				250	102	44	54	19				
Cadmium Cd				0.02	0.01	0.00	0.01	0.00				
Calcium Ca				72748	42052	17186	21287	7430				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.83	0.91	1.79	0.34	0.12				
Copper Cu				9	7	2	4	1				
Iron Fe				371	561	160	219	76				
Lead Pb				0.15	0.29	0.08	0.09	0.03				
Lithium Li				21	13	5	7	2				
Magnesium Mg				53138	29660	12605	15790	5510				
Manganese Mn				49	94	25	25	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.55	0.94	0.45	0.52	0.18				
Nickel Ni				3.34	2.80	0.97	1.18	0.41				
Phosphorus P				133	89	49	51	18				
Potassium K				22270	12009	5009	6252	2182				
Selenium Se				6.50	2.57	1.17	1.35	0.47				
Silicon SiO2				3822	2371	997	1275	445				
Silver Ag				0.02	0.01	0.00	0.00	0.00				
Sodium Na				285543	149447	65390	78243	27306				
Strontium Sr				297	191	69	98	34				
Tellurium Te				363	225	95	121	42				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.00	0.00	0.00	0.00	0.00				
Tin Sn				3.02	1.87	0.79	1.01	0.35				
Titanium Ti				44	27	11	15	5				
Uranium U				0.18	0.14	0.07	0.08	0.03				
Vanadium V				4.16	0.32	0.49	0.40	0.14				
Zinc Zn				7.66	14.83	5.63	4.45	1.55				
Zirconium Zr				36	23	9	12	4				

Table H 5-A-3
Scenario 5**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter												
TDS				1042057	562564	243759	360103	125675				
TSS				29014	26367	11344	16927	5907				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				4	3	1	1	0				
Sulphate				24417	14690	6393	8513	2971				
Chloride				458632	284276	115780	157792	55068				
Total Ammonia				36	36	26	31	11				
Nitrate				244	149	61	77	27				
Nitrite				14	9	4	5	2				
Alkalinity				201272	115383	51649	64908	22653				
OrthoPhosphate-P				14	9	4	4	2				
Phosphate-P				128	85	47	50	17				
Org. Carbon				39957	23122	14207	12169	4247				
Hardness CaCO3				333411	194542	81455	107869	37646				
Total Metals												
Aluminum Al				242	269	153	175	61				
Antimony Sb				3.4	4.2	5.5	1.3	0.5				
Arsenic As				3.5	1.9	0.7	0.9	0.3				
Barium Ba				21	14	6	8	3				
Beryllium Be				0.08	0.04	0.02	0.02	0.01				
Bismuth Bi				0.96	0.59	0.24	0.31	0.11				
Boron B				249	102	44	54	19				
Cadmium Cd				0.02	0.01	0.00	0.01	0.00				
Calcium Ca				71650	41391	16929	20963	7316				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.79	0.88	1.78	0.32	0.11				
Copper Cu				9	7	2	4	1				
Iron Fe				371	561	160	219	76				
Lead Pb				0.15	0.29	0.07	0.09	0.03				
Lithium Li				21	13	5	7	2				
Magnesium Mg				53115	29646	12600	15783	5508				
Manganese Mn				49	94	25	25	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.51	0.92	0.44	0.51	0.18				
Nickel Ni				3.30	2.78	0.97	1.17	0.41				
Phosphorus P				132	88	48	51	18				
Potassium K				22092	11901	4967	6199	2163				
Selenium Se				6.50	2.57	1.17	1.35	0.47				
Silicon SiO2				3808	2362	993	1271	444				
Silver Ag				0.02	0.01	0.00	0.00	0.00				
Sodium Na				285415	149368	65360	78205	27292				
Strontium Sr				297	190	69	98	34				
Tellurium Te				363	225	95	121	42				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.00	0.00	0.00	0.00	0.00				
Tin Sn				3.00	1.86	0.78	1.00	0.35				
Titanium Ti				44	27	11	15	5				
Uranium U				0.18	0.14	0.07	0.08	0.03				
Vanadium V				4.15	0.31	0.49	0.39	0.14				
Zinc Zn				7.56	14.77	5.61	4.42	1.54				
Zirconium Zr				36	23	9	12	4				

Table H 5-A-3
Scenario 5**Solute Loadings in DSolute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter												
TDS				1039795	561186	243223	359426	125438				
TSS				29017	26368	11344	16927	5907				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				4	2	1	1	0				
Sulphate				24051	14469	6307	8404	2933				
Chloride				456777	283153	115342	157238	54875				
Total Ammonia				36	36	26	31	11				
Nitrate				200	122	50	64	22				
Nitrite				14	9	4	5	2				
Alkalinity				201174	115321	51625	64878	22642				
OrthoPhosphate-P				13	8	3	4	1				
Phosphate-P				127	85	47	49	17				
Org. Carbon				39971	23129	14210	12173	4248				
Hardness CaCO3				333151	194381	81392	107791	37618				
Total Metals												
Aluminum Al				242	268	153	175	61				
Antimony Sb				3.3	4.1	5.5	1.3	0.5				
Arsenic As				3.5	1.9	0.7	0.9	0.3				
Barium Ba				21	14	6	8	3				
Beryllium Be				0.08	0.04	0.01	0.02	0.01				
Bismuth Bi				0.89	0.55	0.22	0.29	0.10				
Boron B				249	102	44	54	19				
Cadmium Cd				0.02	0.01	0.00	0.01	0.00				
Calcium Ca				70723	40831	16711	20687	7220				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.75	0.85	1.77	0.31	0.11				
Copper Cu				9	7	2	4	1				
Iron Fe				371	560	160	219	76				
Lead Pb				0.15	0.28	0.07	0.09	0.03				
Lithium Li				20	13	5	7	2				
Magnesium Mg				53096	29634	12595	15777	5506				
Manganese Mn				49	94	25	25	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.48	0.90	0.43	0.50	0.17				
Nickel Ni				3.27	2.76	0.96	1.16	0.40				
Phosphorus P				131	87	48	51	18				
Potassium K				21941	11810	4932	6154	2148				
Selenium Se				6.50	2.57	1.17	1.35	0.47				
Silicon SiO2				3796	2355	990	1268	442				
Silver Ag				0.01	0.01	0.00	0.00	0.00				
Sodium Na				285307	149301	65334	78173	27281				
Strontium Sr				297	190	68	98	34				
Tellurium Te				363	225	95	121	42				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.00	0.00	0.00	0.00	0.00				
Tin Sn				2.99	1.86	0.78	1.00	0.35				
Titanium Ti				44	27	11	15	5				
Uranium U				0.18	0.14	0.07	0.08	0.03				
Vanadium V				4.13	0.31	0.48	0.39	0.14				
Zinc Zn				7.48	14.71	5.59	4.40	1.54				
Zirconium Zr				36	23	9	12	4				

Table H 5-A-3
Scenario 5**Solute Loadings in DSolute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16	Year 10 Jan-17
Parameter												
TDS				1037866	560008	242763	358845	125235				
TSS				29019	26369	11345	16928	5907				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				3	2	1	1	0				
Sulphate				23738	14280	6233	8310	2901				
Chloride				455194	282194	114966	156762	54709				
Total Ammonia				36	36	26	31	11				
Nitrate				161	99	40	52	18				
Nitrite				14	9	4	5	2				
Alkalinity				201090	115267	51605	64852	22633				
OrthoPhosphate-P				13	8	3	4	1				
Phosphate-P				126	84	47	49	17				
Org. Carbon				39982	23135	14212	12176	4249				
Hardness CaCO3				332929	194243	81339	107723	37595				
Total Metals												
Aluminum Al				242	268	153	175	61				
Antimony Sb				3.2	4.1	5.5	1.3	0.5				
Arsenic As				3.5	1.9	0.7	0.9	0.3				
Barium Ba				21	14	6	8	3				
Beryllium Be				0.07	0.03	0.01	0.02	0.01				
Bismuth Bi				0.84	0.51	0.21	0.27	0.09				
Boron B				249	102	44	54	19				
Cadmium Cd				0.02	0.01	0.00	0.01	0.00				
Calcium Ca				69933	40354	16523	20449	7137				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.71	0.83	1.76	0.30	0.10				
Copper Cu				9	7	2	4	1				
Iron Fe				371	560	160	219	76				
Lead Pb				0.15	0.28	0.07	0.09	0.03				
Lithium Li				20	13	5	7	2				
Magnesium Mg				53079	29623	12591	15772	5504				
Manganese Mn				49	93	25	25	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.45	0.88	0.42	0.49	0.17				
Nickel Ni				3.24	2.74	0.95	1.15	0.40				
Phosphorus P				130	87	48	50	18				
Potassium K				21813	11733	4901	6116	2134				
Selenium Se				6.50	2.57	1.17	1.35	0.47				
Silicon SiO2				3786	2348	988	1265	441				
Silver Ag				0.01	0.01	0.00	0.00	0.00				
Sodium Na				285215	149244	65312	78145	27271				
Strontium Sr				296	190	68	98	34				
Tellurium Te				363	225	95	121	42				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.00	0.00	0.00	0.00	0.00				
Tin Sn				2.99	1.85	0.78	1.00	0.35				
Titanium Ti				44	27	11	15	5				
Uranium U				0.18	0.14	0.07	0.08	0.03				
Vanadium V				4.12	0.30	0.48	0.39	0.13				
Zinc Zn				7.41	14.67	5.57	4.38	1.53				
Zirconium Zr				36	23	9	12	4				

Table H-5-A-1
Scenario 5

OUTPUT SUMMARY							Fraction of CCME in Doris Creek (%)	
Discharge rate		200000 m3/year						
Degradation Field(age)		Tail Lk Cu < CME Year		34				
Maximum Concentration		MMER	CCME	Tail Lake Year 2	Doris Creek Year 12	L'Roberts L Year 12		
pH			6 to 9	7 to 8	7 to 8	7 to 8	1%	
TDS	mg/L			584	161	173		
TSS	mg/L			4.4	7.0	8.1		
Free CN	mg/L		0.005	0.0027	0.00003	0.00002		
Total CN	mg/L	1.0		0.026	0.002	0.002		
WAD CN	mg/L			0.0036	0.0000	0.0000		
CNO	mg/L			3.0	0.04	0.02		
SCN	mg/L			0.094	0.001	0.001		
Sulphate	mg/L			87	4.2	5.2		
Chloride	mg/L			418	75	73		
Total Ammonia	mg/L		0.97	1.06	0.024	0.013		2%
Nitrate	mg/L		2.9	5.3	0.09	0.05		3%
Nitrite	mg/L		0.018	0.42	0.007	0.005		41%
Alkalinity	mg/L			53	28	26		
OrthoPhosphate-P	mg/L			0.1584	0.0037	0.0025		
Phosphate-P	mg/L			0.1616	0.0255	0.0256		
Org. Carbon	mg/L			6.4	7.5	7.0		
Hardness CaCO3	mg/L			104	46	46		
Total Metals								
Aluminum Al	mg/L		0.1	0.12	0.08	0.25	81%	
Antimony Sb	mg/L			0.0145	0.0030	0.0018	10%	
Arsenic As	mg/L	0.5	0.005	0.00	0.0005	0.0005		
Barium Ba	mg/L			0.0101	0.0032	0.0052		
Beryllium Be	mg/L			0.00057	0.00002	0.00001		
Bismuth Bi	mg/L			0.01392	0.00029	0.00023	10%	
Boron B	mg/L			0.031	0.034	0.030		
Cadmium Cd	mg/L		0.000038	0.000053	0.0000039	0.0000152		
Calcium Ca	mg/L			234	13	10		
Chromium Cr	mg/L		0.001	0.0062	0.001	0.001	73%	
Cobalt Co	mg/L			0.0098	0.0010	0.0004	81%	
Copper Cu	mg/L	0.3	0.002	0.009	0.0016	0.0019		
Iron Fe	mg/L		0.3	0.15	0.13	0.28		
Lead Pb	mg/L	0.2	0.002	0.00039	0.00007	0.00026		
Lithium Li	mg/L			0.0050	0.0029	0.0029	3%	
Magnesium Mg	mg/L			8.9	7.3	7.3	1%	
Manganese Mn	mg/L			0.027	0.021	0.024		
Mercury Hg	mg/L		0.0001	0.0000095	0.0000010	0.0000008		
Molybdenum Mo	mg/L		0.073	0.0085	0.00028	0.00028		
Nickel Ni	mg/L	0.5	0.025	0.008	0.0007	0.0007	0%	
Phosphorus P	mg/L			0.237	0.027	0.026	3%	
Potassium K	mg/L			39	3.3	3.0	90%	
Selenium Se	mg/L		0.001	0.00084	0.00090	0.00083		
Silicon SiO2	mg/L			3.8	0.58	0.56		
Silver Ag	mg/L		0.0001	0.00011	0.0000065	0.0000055		
Sodium Na	mg/L			112	42	40	6%	
Strontium Sr	mg/L			0.084	0.042	0.047	4%	
Tellurium Te	mg/L			0.052	0.050	0.051		
Thallium Tl	mg/L		0.0008	0.000042	0.000030	0.002001		
Thorium Th	mg/L			0.000037	0.0000020	0.0000010		
Tin Sn	mg/L			0.00220	0.00043	0.00002	11%	
Titanium Ti	mg/L			0.0118	0.0062	0.0063		
Uranium U	mg/L			0.000071	0.000040	0.000044		
Vanadium V	mg/L			0.0033	0.0006	0.0005		
Zinc Zn	mg/L	0.5	0.03	0.022	0.0034	0.0053		
Zirconium Zr	mg/L			0.0054	0.0050	0.0052		

Table H-5-A-2
Scenario 5

Water Quality in Little Roberst Lake Outflow

Date		Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter													
TDS	mg/L				151	151	141	161	162				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L				0.00001	0.00000	0.00000	0.00000	0.00000				
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L				0.0000	0.0000	0.0000	0.0000	0.0000				
CNO	mg/L				0.01	0.00	0.00	0.00	0.00				
SCN	mg/L				0.000	0.000	0.000	0.000	0.000				
Sulphate	mg/L				3.9	3.8	4.8	4.6	4.7				
Chloride	mg/L				61	59	58	66	66				
Total Ammonia	mg/L				0.008	0.010	0.003	0.010	0.010				
Nitrate	mg/L				0.02	0.03	0.02	0.03	0.03				
Nitrite	mg/L				0.003	0.004	0.001	0.003	0.003				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0012	0.0012	0.0012	0.0013	0.0013				
Phosphate-P	mg/L				0.0242	0.0162	0.0073	0.0193	0.0193				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00011	0.00012	0.00013	0.00013	0.00013				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000029	0.0000045	0.0000150	0.0000025	0.0000026				
Calcium Ca	mg/L				8	7	7	8	8				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00019	0.00018	0.00025	0.00021	0.00022				
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.025	0.017	0.008	0.020	0.020				
Potassium K	mg/L				2.7	2.2	2.2	2.5	2.6				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00060	0.00060				
Silicon SiO2	mg/L				0.51	0.51	0.51	0.51	0.52				
Silver Ag	mg/L				0.0000041	0.0000015	0.0000039	0.0000023	0.0000023				
Sodium Na	mg/L				37	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00000	0.00000	0.00001	0.00001	0.00001				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0016	0.0052	0.0052				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-5-A-2
Scenario 5

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter													
TDS	mg/L				152	153	142	163	163				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L				0.00002	0.00000	0.00000	0.00000	0.00000				
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L				0.0000	0.0000	0.0000	0.0000	0.0000				
CNO	mg/L				0.02	0.00	0.00	0.00	0.00				
SCN	mg/L				0.000	0.000	0.000	0.000	0.000				
Sulphate	mg/L				4.2	4.1	5.1	4.9	4.9				
Chloride	mg/L				62	60	59	67	67				
Total Ammonia	mg/L				0.009	0.013	0.002	0.010	0.010				
Nitrate	mg/L				0.04	0.04	0.04	0.05	0.05				
Nitrite	mg/L				0.005	0.003	0.001	0.003	0.003				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0016	0.0016	0.0016	0.0016	0.0016				
Phosphate-P	mg/L				0.0246	0.0166	0.0076	0.0196	0.0196				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	39	41	45	45				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0005	0.0018	0.0012	0.0007	0.0007				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0045	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00015	0.00015	0.00015	0.00016	0.00016				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000031	0.0000046	0.0000152	0.0000027	0.0000027				
Calcium Ca	mg/L				9	8	8	9	9				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0002	0.0002				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00022	0.00020	0.00027	0.00024	0.00024				
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.025	0.017	0.008	0.020	0.020				
Potassium K	mg/L				2.9	2.4	2.3	2.6	2.7				
Selenium Se	mg/L				0.00064	0.00037	0.00083	0.00060	0.00060				
Silicon SiO2	mg/L				0.52	0.52	0.52	0.52	0.52				
Silver Ag	mg/L				0.0000042	0.0000016	0.0000040	0.0000024	0.0000024				
Sodium Na	mg/L				38	31	34	36	36				
Strontium Sr	mg/L				0.045	0.037	0.039	0.046	0.046				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0036	0.0018	0.0016	0.0052	0.0052				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-5-A-2
Scenario 5

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter													
TDS	mg/L				153	153	143	163	163				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L				0.00001								
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L				0.0000								
CNO	mg/L				0.01								
SCN	mg/L				0.001	0.001	0.000	0.000	0.000				
Sulphate	mg/L				4.3	4.2	5.1	4.9	4.9				
Chloride	mg/L				63	60	59	67	67				
Total Ammonia	mg/L				0.008	0.010	0.002	0.009	0.009				
Nitrate	mg/L				0.05	0.05	0.04	0.05	0.05				
Nitrite	mg/L				0.004	0.003	0.001	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0018	0.0018	0.0018	0.0018	0.0018				
Phosphate-P	mg/L				0.0248	0.0168	0.0078	0.0198	0.0198				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				44	39	41	45	45				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0005	0.0018	0.0012	0.0007	0.0007				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0035	0.0045	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00017	0.00017	0.00017	0.00017	0.00018				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000031	0.0000047	0.0000152	0.0000027	0.0000027				
Calcium Ca	mg/L				9	8	8	9	9				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0004	0.0004	0.0002	0.0002				
Copper Cu	mg/L				0.0012	0.0014	0.0016	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.1	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00023	0.00021	0.00028	0.00024	0.00024				
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.026	0.018	0.008	0.020	0.021				
Potassium K	mg/L				2.9	2.4	2.4	2.7	2.7				
Selenium Se	mg/L				0.00064	0.00037	0.00083	0.00060	0.00060				
Silicon SiO2	mg/L				0.53	0.53	0.52	0.52	0.52				
Silver Ag	mg/L				0.0000043	0.0000017	0.0000041	0.0000024	0.0000024				
Sodium Na	mg/L				38	31	34	36	36				
Strontium Sr	mg/L				0.045	0.037	0.039	0.046	0.046				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0036	0.0018	0.0017	0.0052	0.0052				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-5-A-2
Scenario 5

Water Quality in Little Roberst Lake Outflow

Date		Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter													
TDS	mg/L				153	153	143	163	163				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.000	0.000	0.000	0.000	0.000				
Sulphate	mg/L				4.2	4.1	5.1	4.9	4.9				
Chloride	mg/L				63	60	59	67	67				
Total Ammonia	mg/L				0.007	0.007	0.002	0.009	0.009				
Nitrate	mg/L				0.05	0.05	0.04	0.05	0.05				
Nitrite	mg/L				0.003	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0019	0.0019	0.0018	0.0018	0.0018				
Phosphate-P	mg/L				0.0249	0.0169	0.0079	0.0199	0.0199				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				44	39	41	45	45				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0005	0.0018	0.0012	0.0007	0.0007				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0035	0.0045	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00018	0.00018	0.00018	0.00017	0.00017				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000031	0.0000046	0.0000152	0.0000027	0.0000027				
Calcium Ca	mg/L				9	8	8	9	9				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0002	0.0002				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.1	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00022	0.00020	0.00027	0.00023	0.00023				
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.026	0.018	0.009	0.020	0.020				
Potassium K	mg/L				2.9	2.4	2.3	2.6	2.6				
Selenium Se	mg/L				0.00064	0.00037	0.00083	0.00060	0.00060				
Silicon SiO2	mg/L				0.52	0.52	0.52	0.52	0.52				
Silver Ag	mg/L				0.0000044	0.0000017	0.0000041	0.0000024	0.0000024				
Sodium Na	mg/L				38	31	34	36	36				
Strontium Sr	mg/L				0.045	0.037	0.039	0.046	0.046				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0036	0.0018	0.0016	0.0052	0.0052				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-5-A-2
Scenario 5

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter													
TDS	mg/L				153	153	143	163	163				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.000	0.000	0.000	0.000	0.000				
Sulphate	mg/L				4.2	4.1	5.0	4.8	4.8				
Chloride	mg/L				63	60	59	67	67				
Total Ammonia	mg/L				0.007	0.007	0.002	0.009	0.009				
Nitrate	mg/L				0.04	0.04	0.04	0.04	0.04				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0018	0.0018	0.0017	0.0017	0.0017				
Phosphate-P	mg/L				0.0248	0.0168	0.0078	0.0198	0.0198				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0005	0.0018	0.0012	0.0007	0.0007				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0045	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00017	0.00017	0.00017	0.00017	0.00017				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000031	0.0000046	0.0000151	0.0000026	0.0000027				
Calcium Ca	mg/L				9	8	8	8	8				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0002	0.0002				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00022	0.00020	0.00027	0.00023	0.00023				
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.025	0.017	0.008	0.020	0.020				
Potassium K	mg/L				2.9	2.3	2.3	2.6	2.6				
Selenium Se	mg/L				0.00064	0.00037	0.00083	0.00060	0.00060				
Silicon SiO2	mg/L				0.52	0.52	0.52	0.52	0.52				
Silver Ag	mg/L				0.0000044	0.0000017	0.0000041	0.0000024	0.0000024				
Sodium Na	mg/L				38	31	34	36	36				
Strontium Sr	mg/L				0.045	0.037	0.039	0.046	0.046				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0036	0.0018	0.0016	0.0052	0.0052				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-5-A-2
Scenario 5

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter													
TDS	mg/L				153	153	143	163	163				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.000	0.000	0.000	0.000	0.000				
Sulphate	mg/L				4.1	4.0	5.0	4.8	4.8				
Chloride	mg/L				63	60	59	67	67				
Total Ammonia	mg/L				0.005	0.005	0.000	0.007	0.007				
Nitrate	mg/L				0.03	0.03	0.02	0.03	0.03				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0017	0.0017	0.0017	0.0017	0.0017				
Phosphate-P	mg/L				0.0247	0.0167	0.0077	0.0197	0.0197				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0005	0.0018	0.0012	0.0007	0.0007				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0045	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00016	0.00016	0.00016	0.00016	0.00016				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000027	0.0000042	0.0000147	0.0000022	0.0000022				
Calcium Ca	mg/L				9	7	8	8	8				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.009	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00021	0.00020	0.00026	0.00023	0.00023				
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.025	0.017	0.008	0.020	0.020				
Potassium K	mg/L				2.8	2.3	2.3	2.6	2.6				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.52	0.52	0.52	0.52	0.52				
Silver Ag	mg/L				0.0000038	0.0000012	0.0000035	0.0000019	0.0000019				
Sodium Na	mg/L				38	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.046	0.046				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000000	0.000000	0.000000	0.000000	0.000000				
Tin Sn	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000035	0.000032	0.000034	0.000042	0.000042				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0016	0.0052	0.0052				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-5-A-2
Scenario 5

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter													
TDS	mg/L				153	153	142	162	162				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.000	0.000	0.000	0.000	0.000				
Sulphate	mg/L				4.1	4.0	5.0	4.7	4.7				
Chloride	mg/L				63	60	59	67	67				
Total Ammonia	mg/L				0.005	0.005	0.000	0.007	0.007				
Nitrate	mg/L				0.02	0.02	0.02	0.02	0.02				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0016	0.0016	0.0016	0.0016	0.0016				
Phosphate-P	mg/L				0.0247	0.0167	0.0076	0.0196	0.0196				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0005	0.0018	0.0012	0.0007	0.0007				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00016	0.00016	0.00015	0.00015	0.00015				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000027	0.0000042	0.0000147	0.0000022	0.0000022				
Calcium Ca	mg/L				9	7	7	8	8				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.009	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00021	0.00019	0.00026	0.00022	0.00022				
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.025	0.017	0.008	0.020	0.020				
Potassium K	mg/L				2.8	2.3	2.3	2.6	2.6				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.52	0.52	0.51	0.51	0.51				
Silver Ag	mg/L				0.0000038	0.0000011	0.0000035	0.0000019	0.0000019				
Sodium Na	mg/L				38	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.046	0.046				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000000	0.000000	0.000000	0.000000	0.000000				
Tin Sn	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000035	0.000032	0.000034	0.000042	0.000042				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0016	0.0052	0.0052				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-5-A-2
Scenario 5

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter													
TDS	mg/L				152	152	142	162	162				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.000	0.000	0.000	0.000	0.000				
Sulphate	mg/L				4.1	4.0	4.9	4.7	4.7				
Chloride	mg/L				63	60	59	66	67				
Total Ammonia	mg/L				0.005	0.005	0.000	0.007	0.007				
Nitrate	mg/L				0.02	0.02	0.01	0.02	0.02				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0016	0.0016	0.0015	0.0015	0.0015				
Phosphate-P	mg/L				0.0246	0.0166	0.0076	0.0196	0.0196				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0005	0.0018	0.0012	0.0007	0.0007				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00015	0.00015	0.00015	0.00015	0.00015				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000026	0.0000042	0.0000147	0.0000022	0.0000022				
Calcium Ca	mg/L				8	7	7	8	8				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.009	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00021	0.00019	0.00026	0.00022	0.00022				
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.025	0.017	0.008	0.020	0.020				
Potassium K	mg/L				2.8	2.3	2.3	2.6	2.6				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.51	0.51	0.51	0.51	0.51				
Silver Ag	mg/L				0.0000038	0.0000011	0.0000035	0.0000019	0.0000019				
Sodium Na	mg/L				38	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.046	0.046				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000000	0.000000	0.000000	0.000000	0.000000				
Tin Sn	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000035	0.000032	0.000034	0.000042	0.000042				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0016	0.0052	0.0052				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-5-A-2
Scenario 5

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter													
TDS	mg/L				152	152	142	162	162				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.000	0.000	0.000	0.000	0.000				
Sulphate	mg/L				4.0	3.9	4.9	4.7	4.7				
Chloride	mg/L				62	59	58	66	66				
Total Ammonia	mg/L				0.005	0.005	0.000	0.007	0.007				
Nitrate	mg/L				0.02	0.02	0.01	0.02	0.02				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0015	0.0015	0.0015	0.0015	0.0015				
Phosphate-P	mg/L				0.0246	0.0165	0.0075	0.0195	0.0195				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0005	0.0018	0.0012	0.0007	0.0007				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00015	0.00015	0.00014	0.00014	0.00014				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000026	0.0000041	0.0000147	0.0000022	0.0000022				
Calcium Ca	mg/L				8	7	7	8	8				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.009	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00020	0.00019	0.00026	0.00022	0.00022				
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.025	0.017	0.008	0.020	0.020				
Potassium K	mg/L				2.8	2.3	2.3	2.6	2.6				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.51	0.51	0.51	0.51	0.51				
Silver Ag	mg/L				0.0000038	0.0000011	0.0000035	0.0000019	0.0000019				
Sodium Na	mg/L				38	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.046	0.046				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000000	0.000000	0.000000	0.000000	0.000000				
Tin Sn	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000035	0.000032	0.000034	0.000042	0.000042				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0016	0.0052	0.0052				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-5-A-2
Scenario 5

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16
Parameter												
TDS	mg/L				152	152	142	162	162			
TSS	mg/L				7.0	8.0	4.0	5.0	5.0			
Free CN	mg/L											
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002			
WAD CN	mg/L											
CNO	mg/L											
SCN	mg/L				0.000	0.000	0.000	0.000	0.000			
Sulphate	mg/L				4.0	3.9	4.9	4.7	4.7			
Chloride	mg/L				62	59	58	66	66			
Total Ammonia	mg/L				0.005	0.005	0.000	0.007	0.007			
Nitrate	mg/L				0.01	0.01	0.01	0.01	0.01			
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002			
Alkalinity	mg/L				23	23	24	25	25			
OrthoPhosphate-P	mg/L				0.0015	0.0015	0.0015	0.0015	0.0015			
Phosphate-P	mg/L				0.0245	0.0165	0.0075	0.0195	0.0195			
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0			
Hardness CaCO3	mg/L				43	38	40	44	44			
Total Metals												
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15			
Antimony Sb	mg/L				0.0005	0.0018	0.0012	0.0007	0.0007			
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004			
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042			
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001			
Bismuth Bi	mg/L				0.00014	0.00014	0.00014	0.00014	0.00014			
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026			
Cadmium Cd	mg/L				0.0000026	0.0000041	0.0000147	0.0000022	0.0000022			
Calcium Ca	mg/L				8	7	7	8	8			
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000			
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001			
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0019	0.0019			
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16			
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025			
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028			
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1			
Manganese Mn	mg/L				0.024	0.009	0.012	0.008	0.008			
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006			
Molybdenum Mo	mg/L				0.00020	0.00019	0.00026	0.00022	0.00022			
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006			
Phosphorus P	mg/L				0.025	0.017	0.008	0.020	0.020			
Potassium K	mg/L				2.8	2.3	2.3	2.6	2.6			
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059			
Silicon SiO2	mg/L				0.51	0.51	0.51	0.51	0.51			
Silver Ag	mg/L				0.0000038	0.0000011	0.0000035	0.0000018	0.0000018			
Sodium Na	mg/L				38	31	34	36	36			
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045			
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050			
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000			
Thorium Th	mg/L				0.000000	0.000000	0.000000	0.000000	0.000000			
Tin Sn	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001			
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060			
Uranium U	mg/L				0.000035	0.000032	0.000034	0.000042	0.000042			
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003			
Zinc Zn	mg/L				0.0035	0.0017	0.0016	0.0052	0.0052			
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050			

Table H 5-A-3
Scenario 5

Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter												
TDS				140	122	126	146	146				
TSS				4.0	5.8	6.0	6.9	6.9				
Free CN				0.00002	0.00000	0.00000	0.00000	0.00000				
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN				0.0000	0.0000	0.0000	0.0000	0.0000				
CNO				0.02	0.01	0.01	0.01	0.01				
SCN				0.000	0.000	0.000	0.000	0.000				
Sulphate				3.0	3.0	3.2	3.4	3.4				
Chloride				61	61	59	63	64				
Total Ammonia				0.010	0.019	0.020	0.019	0.019				
Nitrate				0.04	0.05	0.05	0.06	0.06				
Nitrite				0.004	0.005	0.005	0.005	0.005				
Alkalinity				27	25	27	27	27				
OrthoPhosphate-P				0.0011	0.0012	0.0012	0.0013	0.0014				
Phosphate-P				0.0167	0.0181	0.0242	0.0199	0.0199				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				45	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0009	0.0029	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00005	0.00007	0.00008	0.00009	0.00010				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000034	0.0000035	0.0000030	0.0000031	0.0000031				
Calcium Ca				9	9	8	8	8				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0001	0.0002	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0016	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.5	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00018	0.00018	0.00021	0.00020	0.00020				
Nickel Ni				0.0004	0.0006	0.0005	0.0005	0.0005				
Phosphorus P				0.017	0.019	0.025	0.021	0.021				
Potassium K				2.9	2.5	2.5	2.5	2.5				
Selenium Se				0.00089	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.52	0.52	0.52	0.52	0.53				
Silver Ag				0.0000026	0.0000030	0.0000027	0.0000027	0.0000027				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.040	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000017	0.0000017	0.0000018	0.0000018	0.0000018				
Tin Sn				0.00040	0.00041	0.00041	0.00041	0.00041				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0010	0.0032	0.0029	0.0018	0.0018				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 5-A-3
Scenario 5

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter												
TDS				143	125	129	148	149				
TSS				4.0	5.8	6.0	6.9	6.9				
Free CN				0.00003	0.00000	0.00000	0.00000	0.00000				
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN				0.0000	0.0000	0.0000	0.0000	0.0000				
CNO				0.04	0.00	0.00	0.00	0.00				
SCN				0.001	0.001	0.001	0.001	0.001				
Sulphate				3.6	3.5	3.6	3.8	3.9				
Chloride				63	63	61	65	65				
Total Ammonia				0.014	0.024	0.019	0.018	0.018				
Nitrate				0.08	0.08	0.08	0.09	0.09				
Nitrite				0.007	0.005	0.005	0.005	0.005				
Alkalinity				28	26	27	27	27				
OrthoPhosphate-P				0.0019	0.0019	0.0019	0.0019	0.0020				
Phosphate-P				0.0175	0.0189	0.0249	0.0205	0.0205				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	45	45				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0005	0.0009	0.0029	0.0006	0.0006				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0031	0.0032	0.0032				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00013	0.00014	0.00014	0.00014	0.00015				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000038	0.0000038	0.0000033	0.0000033	0.0000034				
Calcium Ca				11	10	10	10	10				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0001	0.0002	0.0010	0.0002	0.0002				
Copper Cu				0.0013	0.0016	0.0013	0.0016	0.0016				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00002	0.00007	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00023	0.00023	0.00026	0.00024	0.00024				
Nickel Ni				0.0005	0.0006	0.0005	0.0005	0.0005				
Phosphorus P				0.019	0.020	0.026	0.022	0.022				
Potassium K				3.2	2.8	2.7	2.7	2.7				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.54	0.54	0.54	0.54	0.54				
Silver Ag				0.0000029	0.0000032	0.0000029	0.0000029	0.0000030				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000018	0.0000018	0.0000019	0.0000019	0.0000019				
Tin Sn				0.00041	0.00042	0.00042	0.00042	0.00042				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000027	0.000032	0.000040	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0011	0.0033	0.0030	0.0019	0.0019				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 5-A-3
Scenario 5

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter												
TDS				145	126	130	150	150				
TSS				4.0	5.8	6.0	6.9	6.9				
Free CN				0.00002								
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN				0.0000								
CNO				0.02								
SCN				0.001	0.001	0.001	0.001	0.001				
Sulphate				3.8	3.7	3.8	3.9	3.9				
Chloride				64	64	62	66	66				
Total Ammonia				0.012	0.018	0.017	0.016	0.016				
Nitrate				0.09	0.09	0.09	0.09	0.09				
Nitrite				0.006	0.004	0.004	0.003	0.003				
Alkalinity				28	26	27	27	27				
OrthoPhosphate-P				0.0023	0.0024	0.0023	0.0023	0.0024				
Phosphate-P				0.0179	0.0193	0.0253	0.0209	0.0210				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	45	45				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0005	0.0010	0.0030	0.0006	0.0006				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0031	0.0032	0.0032				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00017	0.00018	0.00018	0.00018	0.00019				
Boron B				0.034	0.023	0.023	0.023	0.023				
Cadmium Cd				0.0000039	0.0000039	0.0000034	0.0000034	0.0000034				
Calcium Ca				11	10	10	10	10				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0002	0.0002	0.0010	0.0002	0.0002				
Copper Cu				0.0013	0.0016	0.0013	0.0016	0.0016				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00003	0.00007	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00025	0.00025	0.00027	0.00025	0.00025				
Nickel Ni				0.0005	0.0007	0.0005	0.0005	0.0005				
Phosphorus P				0.019	0.021	0.027	0.022	0.022				
Potassium K				3.2	2.8	2.8	2.7	2.7				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.55	0.55	0.54	0.54	0.54				
Silver Ag				0.0000031	0.0000034	0.0000030	0.0000030	0.0000030				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000019	0.0000019	0.0000019	0.0000019	0.0000019				
Tin Sn				0.00042	0.00042	0.00042	0.00042	0.00042				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000027	0.000032	0.000040	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0012	0.0034	0.0031	0.0019	0.0019				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 5-A-3
Scenario 5

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter												
TDS				145	127	130	150	150				
TSS				4.0	5.8	6.0	6.9	6.9				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.001	0.001	0.001	0.001	0.001				
Sulphate				3.7	3.6	3.7	3.8	3.8				
Chloride				65	65	62	66	66				
Total Ammonia				0.009	0.011	0.017	0.016	0.016				
Nitrate				0.09	0.09	0.09	0.09	0.09				
Nitrite				0.003	0.003	0.003	0.003	0.003				
Alkalinity				28	26	27	27	27				
OrthoPhosphate-P				0.0026	0.0025	0.0024	0.0024	0.0024				
Phosphate-P				0.0182	0.0195	0.0255	0.0210	0.0210				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	45	45				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0005	0.0010	0.0030	0.0006	0.0006				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0031	0.0032	0.0032				
Beryllium Be				0.00002	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00020	0.00019	0.00018	0.00018	0.00018				
Boron B				0.034	0.023	0.023	0.023	0.023				
Cadmium Cd				0.0000038	0.0000038	0.0000033	0.0000033	0.0000033				
Calcium Ca				11	10	10	9	9				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0001	0.0002	0.0010	0.0002	0.0002				
Copper Cu				0.0013	0.0016	0.0013	0.0016	0.0016				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00002	0.00007	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00024	0.00023	0.00026	0.00023	0.00023				
Nickel Ni				0.0005	0.0006	0.0005	0.0005	0.0005				
Phosphorus P				0.020	0.021	0.027	0.022	0.022				
Potassium K				3.2	2.8	2.7	2.7	2.7				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.54	0.54	0.54	0.54	0.54				
Silver Ag				0.0000032	0.0000034	0.0000031	0.0000031	0.0000031				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000019	0.0000019	0.0000019	0.0000019	0.0000019				
Tin Sn				0.00042	0.00042	0.00042	0.00042	0.00042				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000027	0.000032	0.000040	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0011	0.0034	0.0030	0.0019	0.0019				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 5-A-3
Scenario 5

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter												
TDS				144	126	129	149	149				
TSS				4.0	5.8	6.0	6.9	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.001	0.001	0.001	0.001	0.001				
Sulphate				3.6	3.5	3.6	3.7	3.7				
Chloride				64	64	62	66	66				
Total Ammonia				0.008	0.011	0.017	0.016	0.016				
Nitrate				0.08	0.08	0.08	0.08	0.08				
Nitrite				0.003	0.003	0.003	0.003	0.003				
Alkalinity				28	26	27	27	27				
OrthoPhosphate-P				0.0024	0.0023	0.0022	0.0022	0.0022				
Phosphate-P				0.0180	0.0193	0.0253	0.0208	0.0208				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0005	0.0010	0.0030	0.0006	0.0006				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0031	0.0031	0.0031				
Beryllium Be				0.00002	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00018	0.00017	0.00016	0.00016	0.00016				
Boron B				0.034	0.023	0.023	0.022	0.023				
Cadmium Cd				0.0000038	0.0000038	0.0000033	0.0000033	0.0000033				
Calcium Ca				10	10	9	9	9				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0001	0.0002	0.0010	0.0002	0.0002				
Copper Cu				0.0013	0.0016	0.0013	0.0016	0.0016				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00002	0.00007	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00023	0.00022	0.00025	0.00023	0.00023				
Nickel Ni				0.0005	0.0006	0.0005	0.0005	0.0005				
Phosphorus P				0.019	0.021	0.026	0.022	0.022				
Potassium K				3.1	2.7	2.7	2.6	2.6				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.54	0.54	0.54	0.54	0.54				
Silver Ag				0.0000032	0.0000034	0.0000030	0.0000031	0.0000031				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000019	0.0000019	0.0000019	0.0000019	0.0000020				
Tin Sn				0.00042	0.00042	0.00042	0.00042	0.00042				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000027	0.000032	0.000040	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0011	0.0033	0.0030	0.0019	0.0019				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 5-A-3
Scenario 5

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter												
TDS				144	125	129	149	149				
TSS				4.0	5.8	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.001	0.001	0.001	0.001	0.001				
Sulphate				3.5	3.4	3.5	3.6	3.6				
Chloride				64	64	61	65	65				
Total Ammonia				0.005	0.008	0.014	0.013	0.013				
Nitrate				0.05	0.05	0.05	0.05	0.05				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				28	26	27	27	27				
OrthoPhosphate-P				0.0022	0.0022	0.0021	0.0021	0.0021				
Phosphate-P				0.0178	0.0191	0.0251	0.0207	0.0207				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0005	0.0009	0.0029	0.0006	0.0006				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00016	0.00015	0.00015	0.00015	0.00015				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000030	0.0000030	0.0000024	0.0000024	0.0000024				
Calcium Ca				10	9	9	9	9				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0001	0.0002	0.0009	0.0001	0.0001				
Copper Cu				0.0013	0.0016	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo				0.00022	0.00021	0.00024	0.00022	0.00022				
Nickel Ni				0.0005	0.0006	0.0005	0.0005	0.0005				
Phosphorus P				0.019	0.020	0.026	0.021	0.021				
Potassium K				3.1	2.7	2.7	2.6	2.6				
Selenium Se				0.00089	0.00057	0.00062	0.00055	0.00055				
Silicon SiO2				0.53	0.53	0.53	0.53	0.53				
Silver Ag				0.0000021	0.0000023	0.0000019	0.0000020	0.0000020				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000003	0.0000003	0.0000003	0.0000003	0.0000003				
Tin Sn				0.00042	0.00042	0.00041	0.00041	0.00041				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000025	0.000030	0.000038	0.000032	0.000032				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0011	0.0033	0.0030	0.0018	0.0018				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 5-A-3
Scenario 5

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter												
TDS				144	125	128	148	148				
TSS				4.0	5.8	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.001	0.001	0.001	0.001	0.001				
Sulphate				3.4	3.3	3.4	3.5	3.5				
Chloride				63	63	61	65	65				
Total Ammonia				0.005	0.008	0.014	0.013	0.013				
Nitrate				0.04	0.04	0.04	0.04	0.04				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				28	26	27	27	27				
OrthoPhosphate-P				0.0020	0.0020	0.0020	0.0019	0.0019				
Phosphate-P				0.0176	0.0190	0.0250	0.0205	0.0205				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0005	0.0009	0.0029	0.0006	0.0006				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00014	0.00014	0.00014	0.00014	0.00014				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000029	0.0000029	0.0000024	0.0000024	0.0000024				
Calcium Ca				10	9	9	9	9				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0001	0.0002	0.0009	0.0001	0.0001				
Copper Cu				0.0013	0.0016	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo				0.00021	0.00021	0.00023	0.00021	0.00021				
Nickel Ni				0.0005	0.0006	0.0005	0.0005	0.0005				
Phosphorus P				0.018	0.020	0.026	0.021	0.021				
Potassium K				3.1	2.7	2.6	2.6	2.6				
Selenium Se				0.00089	0.00057	0.00062	0.00055	0.00055				
Silicon SiO2				0.52	0.53	0.52	0.52	0.52				
Silver Ag				0.0000021	0.0000023	0.0000019	0.0000019	0.0000019				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000003	0.0000003	0.0000003	0.0000003	0.0000003				
Tin Sn				0.00041	0.00041	0.00041	0.00041	0.00041				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000025	0.000030	0.000038	0.000031	0.000031				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0011	0.0033	0.0030	0.0018	0.0018				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 5-A-3
Scenario 5

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter												
TDS				143	125	128	148	148				
TSS				4.0	5.8	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.001	0.001	0.001	0.001	0.001				
Sulphate				3.4	3.3	3.4	3.5	3.5				
Chloride				63	63	61	65	65				
Total Ammonia				0.005	0.008	0.014	0.013	0.013				
Nitrate				0.03	0.03	0.03	0.03	0.03				
Nitrite				0.0020	0.0020	0.002	0.002	0.002				
Alkalinity				28	26	27	27	27				
OrthoPhosphate-P				0.0019	0.0019	0.0018	0.0018	0.0018				
Phosphate-P				0.0175	0.0189	0.0249	0.0204	0.0204				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0005	0.0009	0.0029	0.0006	0.0006				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00013	0.00013	0.00013	0.00013	0.00013				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000029	0.0000029	0.0000024	0.0000024	0.0000024				
Calcium Ca				10	9	9	9	9				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0001	0.0002	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0016	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo				0.00021	0.00020	0.00023	0.00021	0.00021				
Nickel Ni				0.0005	0.0006	0.0005	0.0005	0.0005				
Phosphorus P				0.018	0.019	0.025	0.021	0.021				
Potassium K				3.0	2.6	2.6	2.5	2.5				
Selenium Se				0.00089	0.00057	0.00062	0.00055	0.00055				
Silicon SiO2				0.52	0.52	0.52	0.52	0.52				
Silver Ag				0.0000021	0.0000023	0.0000019	0.0000019	0.0000019				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000003	0.0000003	0.0000003	0.0000003	0.0000003				
Tin Sn				0.00041	0.00041	0.00041	0.00041	0.00041				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000025	0.000030	0.000038	0.000031	0.000031				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0010	0.0033	0.0029	0.0018	0.0018				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 5-A-3
Scenario 5

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

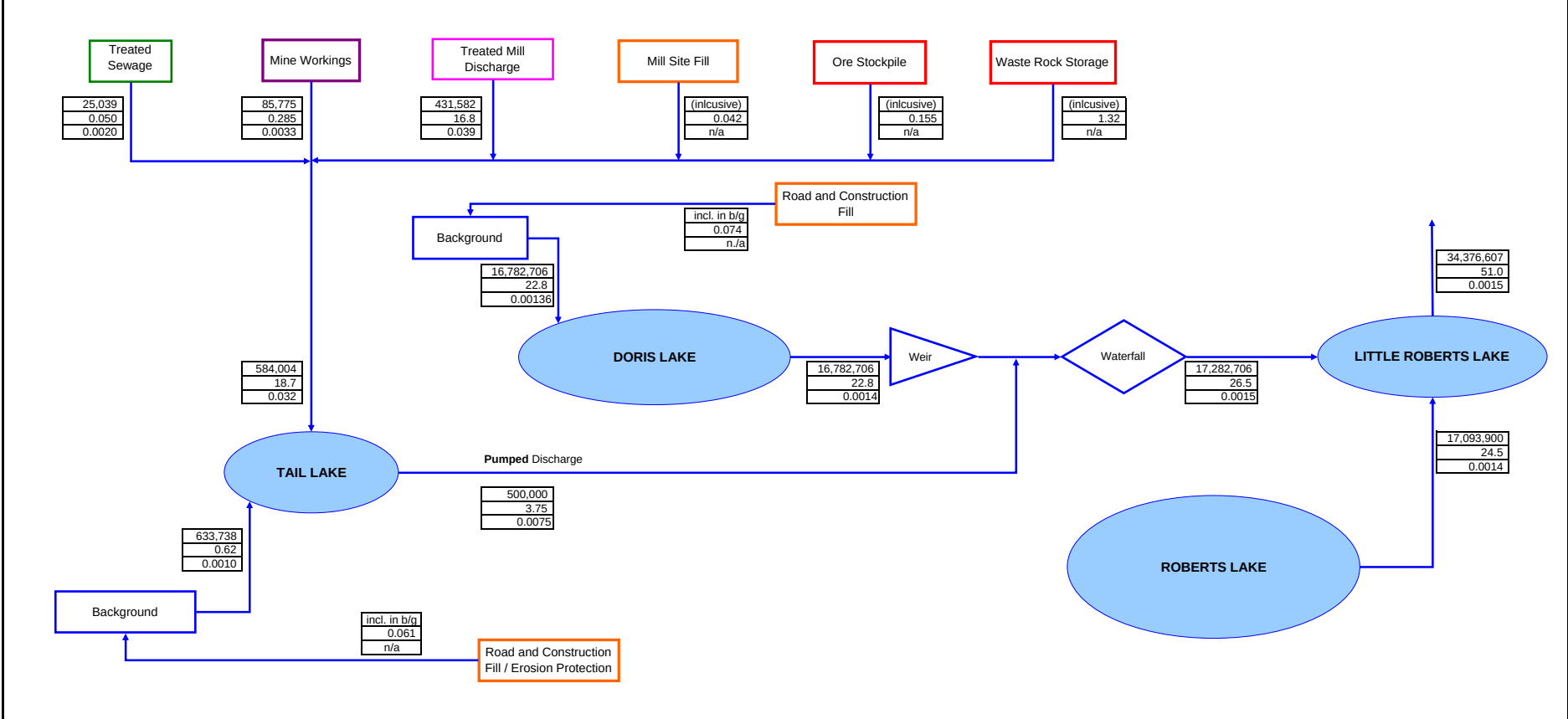
Date	Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter												
TDS				143	124	128	148	148				
TSS				4.0	5.8	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.001	0.001	0.000	0.000	0.000				
Sulphate				3.3	3.2	3.3	3.5	3.5				
Chloride				63	63	61	65	65				
Total Ammonia				0.005	0.008	0.014	0.013	0.013				
Nitrate				0.03	0.03	0.03	0.03	0.03				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				28	26	27	27	27				
OrthoPhosphate-P				0.0018	0.0018	0.0017	0.0017	0.0017				
Phosphate-P				0.0174	0.0188	0.0248	0.0203	0.0203				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0005	0.0009	0.0029	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00012	0.00012	0.00012	0.00012	0.00012				
Boron B				0.034	0.022	0.023	0.022	0.022				
Cadmium Cd				0.0000029	0.0000028	0.0000023	0.0000023	0.0000023				
Calcium Ca				10	9	9	8	8				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0001	0.0002	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0016	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo				0.00020	0.00020	0.00023	0.00020	0.00020				
Nickel Ni				0.0004	0.0006	0.0005	0.0005	0.0005				
Phosphorus P				0.018	0.019	0.025	0.021	0.021				
Potassium K				3.0	2.6	2.6	2.5	2.5				
Selenium Se				0.00089	0.00057	0.00062	0.00055	0.00055				
Silicon SiO2				0.52	0.52	0.52	0.52	0.52				
Silver Ag				0.0000020	0.0000022	0.0000019	0.0000019	0.0000019				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000003	0.0000003	0.0000002	0.0000002	0.0000002				
Tin Sn				0.00041	0.00041	0.00041	0.00041	0.00041				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000025	0.000030	0.000038	0.000031	0.000031				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0010	0.0033	0.0029	0.0018	0.0018				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 5-A-3
Scenario 5

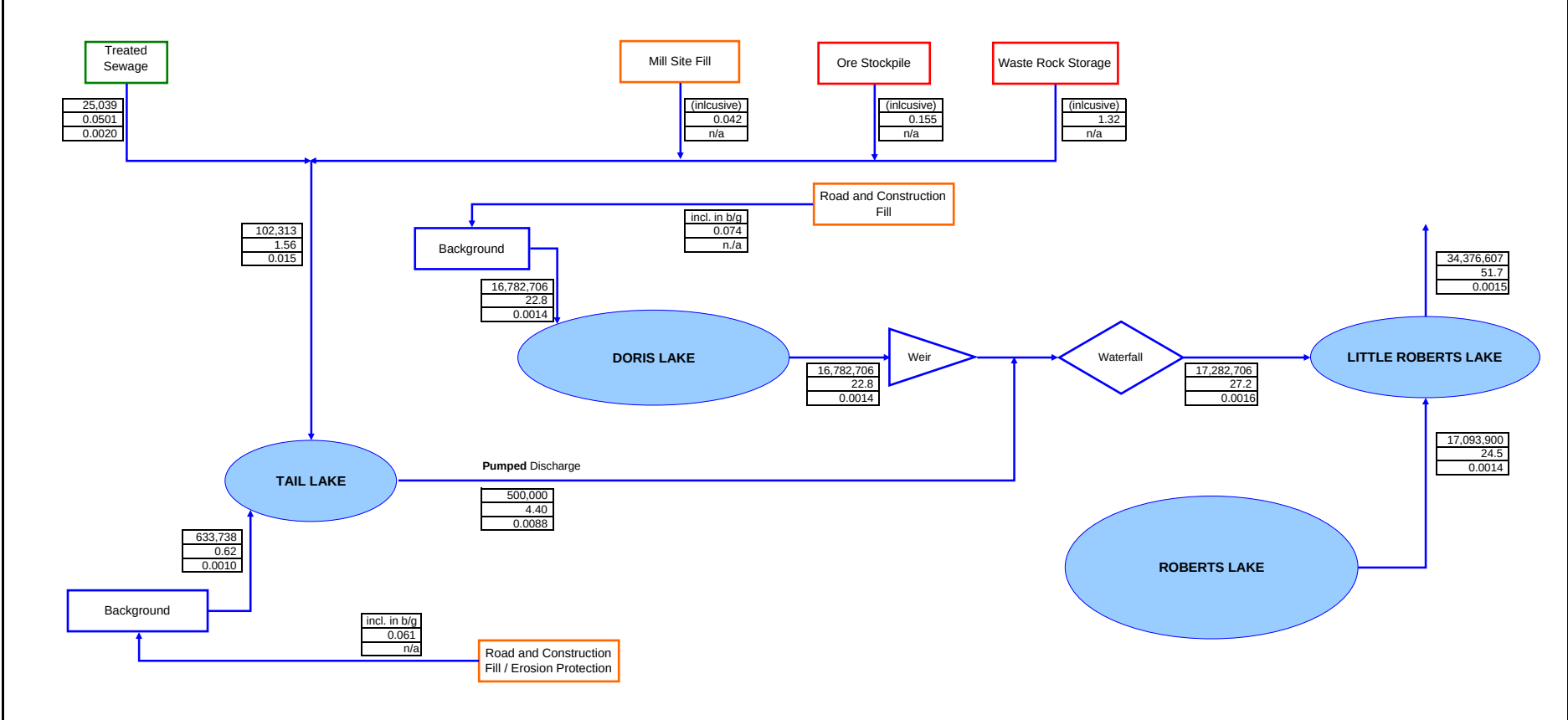
Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16	Year 10 Jan-17
Parameter												
TDS				143	124	128	147	147				
TSS				4.0	5.8	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.000	0.000	0.000	0.000	0.000				
Sulphate				3.3	3.2	3.3	3.4	3.4				
Chloride				63	62	60	64	64				
Total Ammonia				0.005	0.008	0.014	0.013	0.013				
Nitrate				0.02	0.02	0.02	0.02	0.02				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				28	26	27	27	27				
OrthoPhosphate-P				0.0017	0.0017	0.0017	0.0017	0.0017				
Phosphate-P				0.0173	0.0187	0.0247	0.0202	0.0202				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0009	0.0029	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00012	0.00011	0.00011	0.00011	0.00011				
Boron B				0.034	0.022	0.023	0.022	0.022				
Cadmium Cd				0.0000028	0.0000028	0.0000023	0.0000023	0.0000023				
Calcium Ca				10	9	9	8	8				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0001	0.0002	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0016	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo				0.00020	0.00019	0.00022	0.00020	0.00020				
Nickel Ni				0.0004	0.0006	0.0005	0.0005	0.0005				
Phosphorus P				0.018	0.019	0.025	0.021	0.021				
Potassium K				3.0	2.6	2.6	2.5	2.5				
Selenium Se				0.00089	0.00057	0.00062	0.00055	0.00055				
Silicon SiO2				0.52	0.52	0.52	0.52	0.52				
Silver Ag				0.0000020	0.0000022	0.0000018	0.0000019	0.0000019				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000002	0.0000002	0.0000002	0.0000002	0.0000002				
Tin Sn				0.00041	0.00041	0.00041	0.00041	0.00041				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000025	0.000030	0.000038	0.000031	0.000031				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0010	0.0032	0.0029	0.0018	0.0018				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

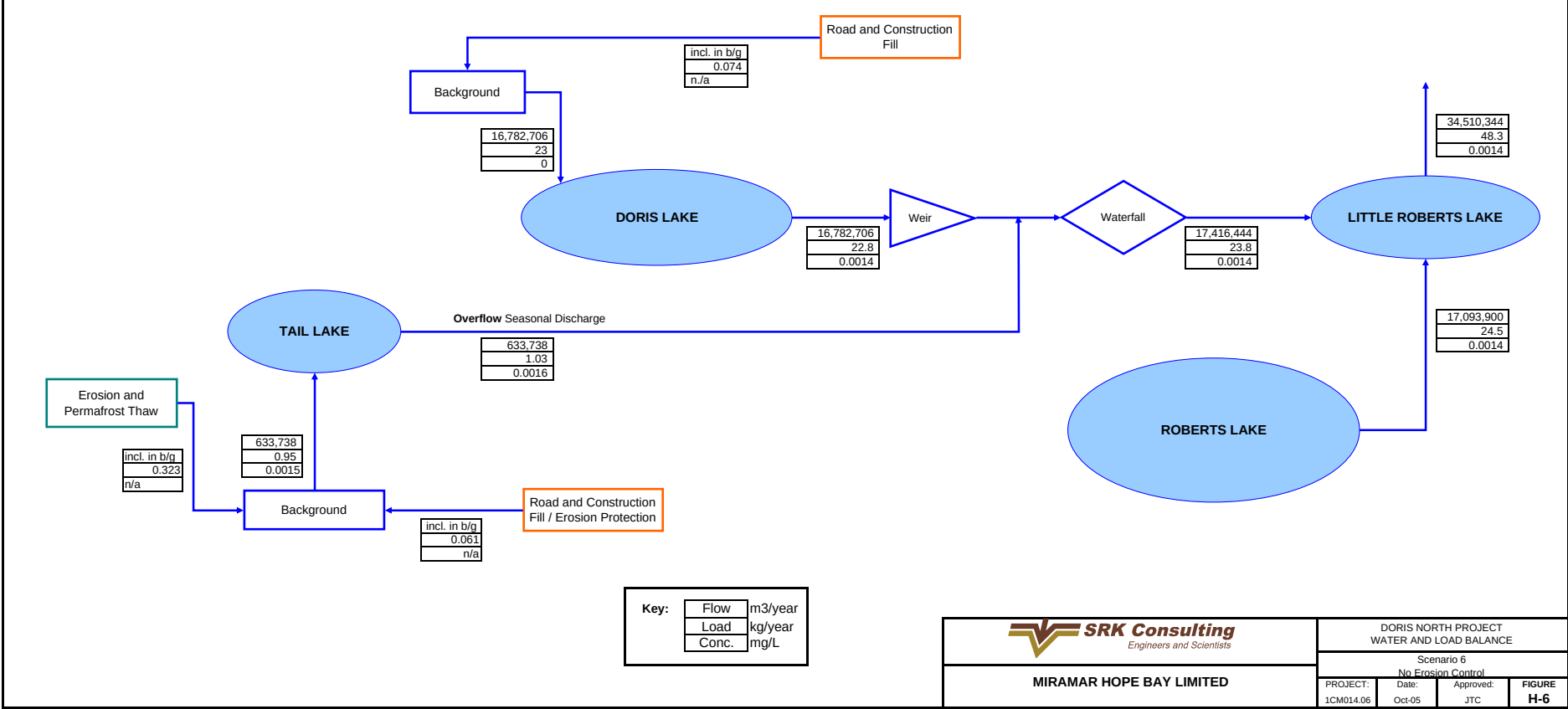
Scenario 6 - OPERATIONAL CONDITIONS
Year 2



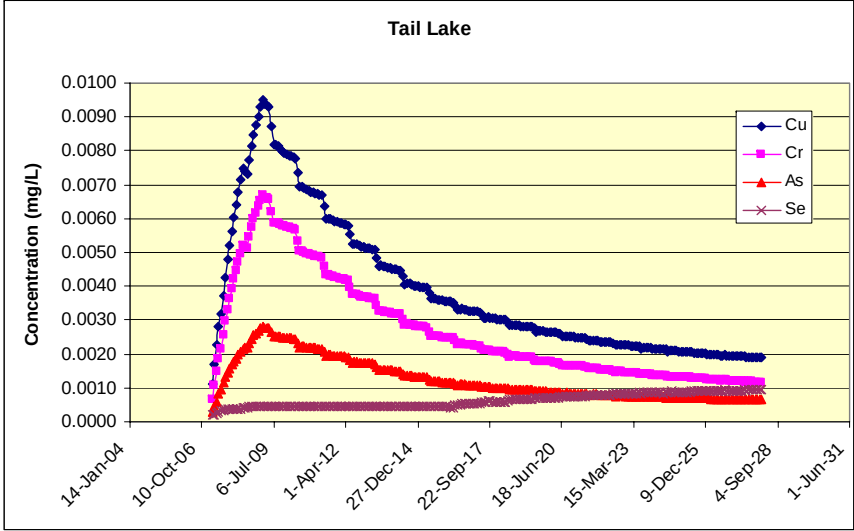
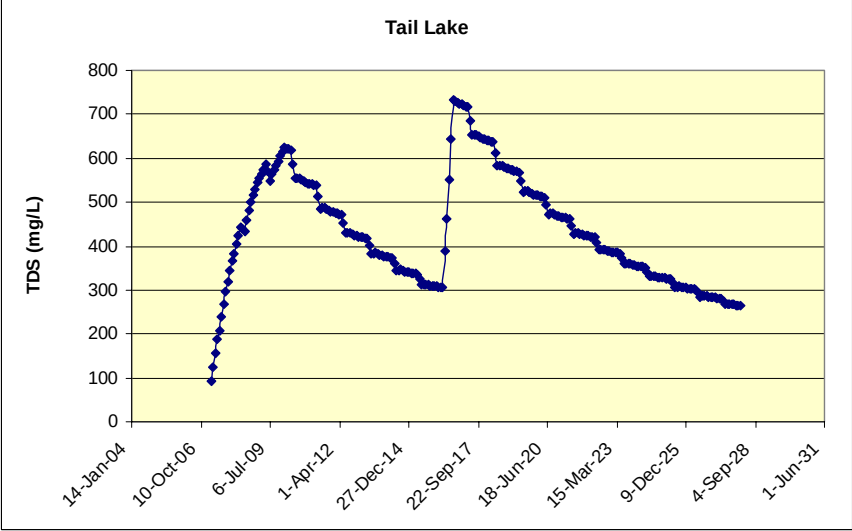
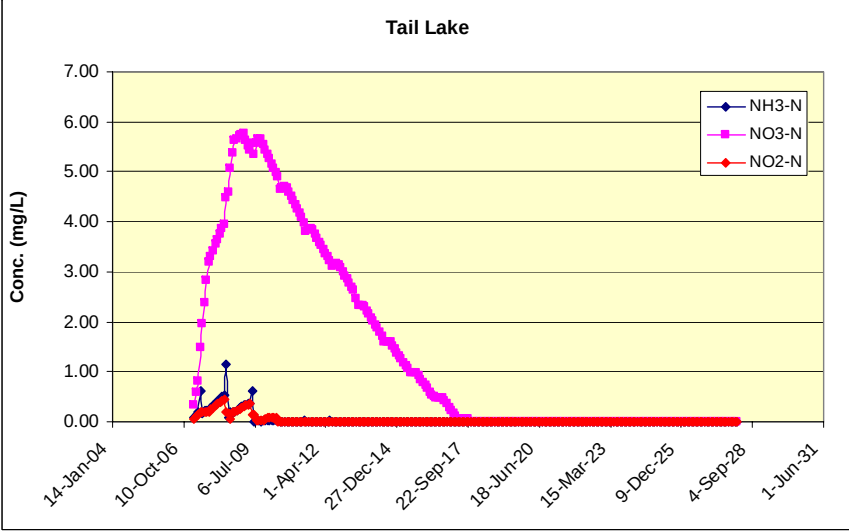
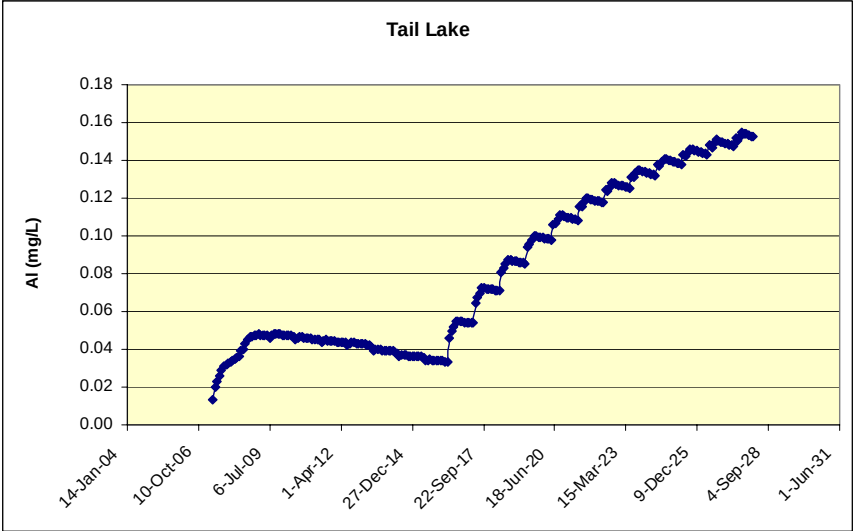
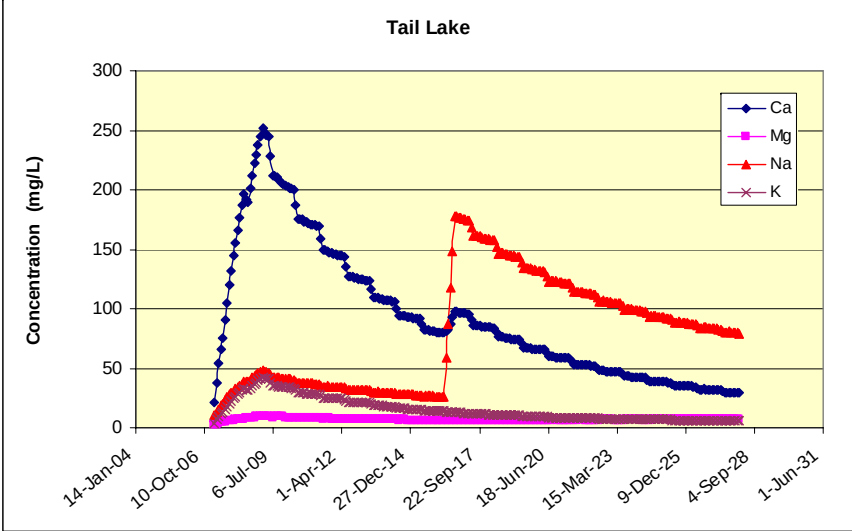
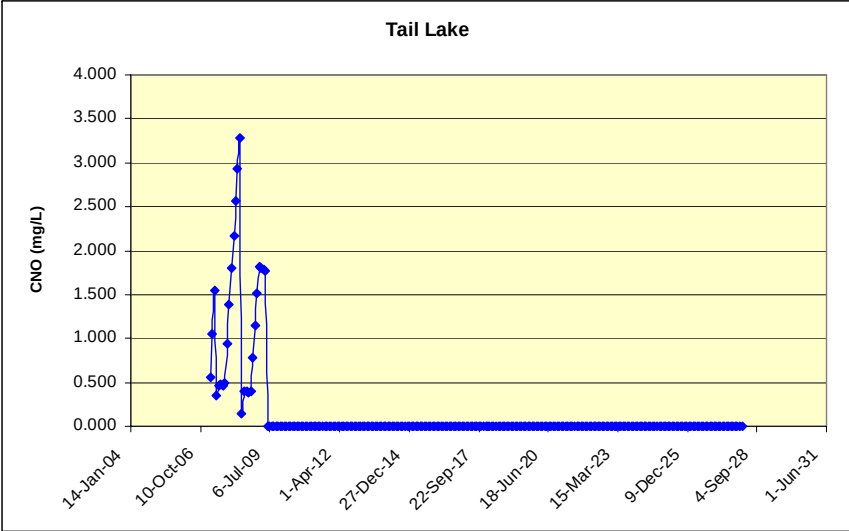
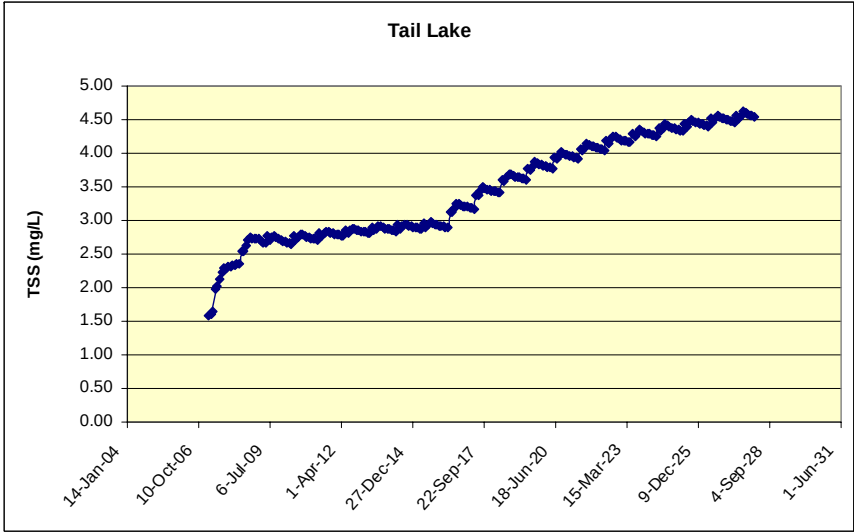
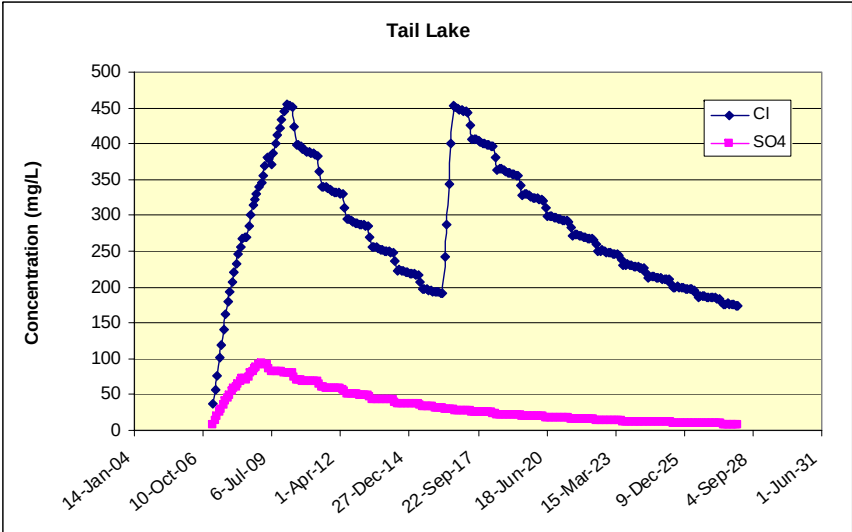
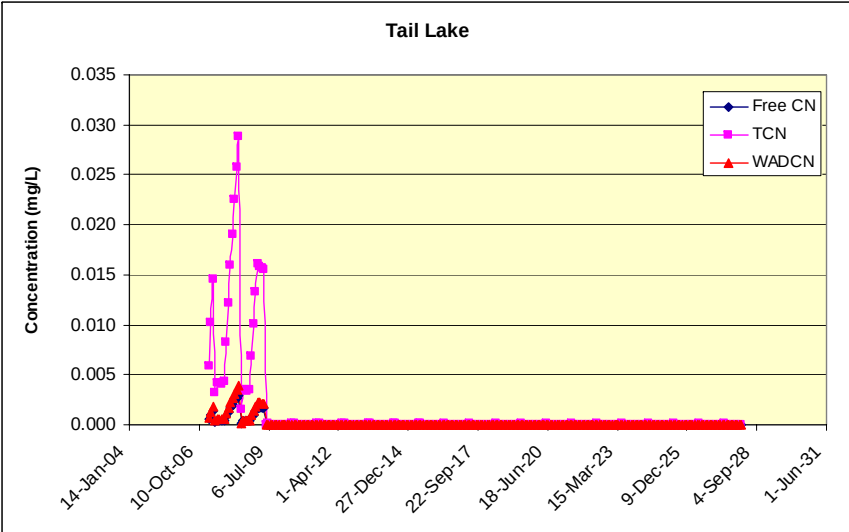
POST MILLING OPERATIONAL CONDITIONS
Year 3



POST CLOSURE CONDITIONS
Year 20



Scenario 6



Scenario 6

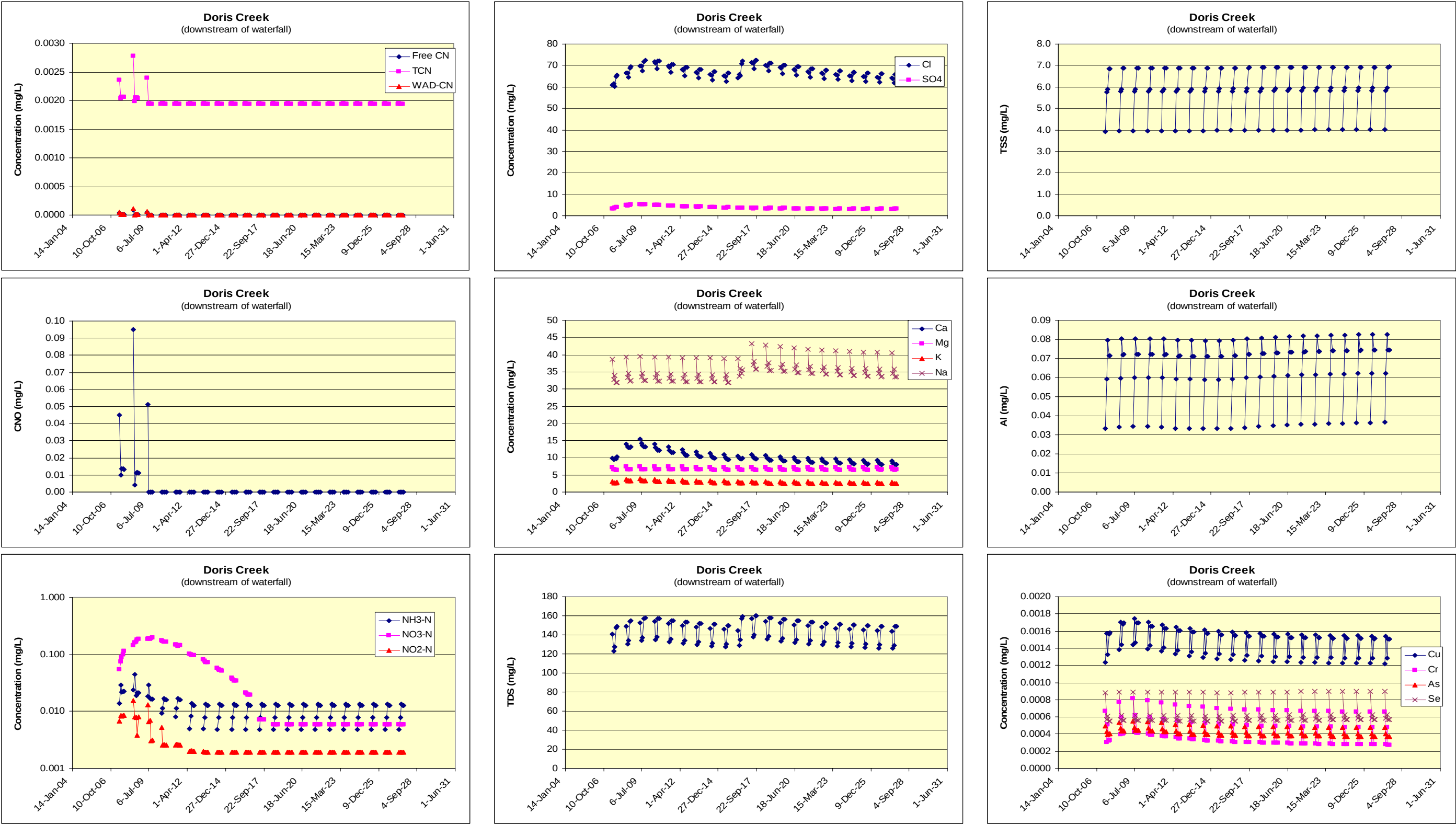


Table H-6-A-1
Scenario 6

OUTPUT SUMMARY						Fraction of CCME in Doris Creek (%)	
Discharge rate		500000 m³/year					
Degradation Field(age)		Tail Lk Cu < CME Year 20					
		MMER	CCME	Tail Lake Year 2	Doris Creek Year 3	L'Roberts L Year 3	
Maximum Concentration							
pH			6 to 9	7 to 8	7 to 8	7 to 8	
TDS	mg/L			732	160	170	
TSS	mg/L			4.6	6.9	8.1	
Free CN	mg/L		0.005	0.0030	0.00009	0.00004	2%
Total CN	mg/L	1.0		0.029	0.003	0.002	
WAD CN	mg/L			0.0040	0.0001	0.0001	
CNO	mg/L			3.3	0.09	0.05	
SCN	mg/L			0.101	0.003	0.001	
Sulphate	mg/L			93	5.4	5.9	
Chloride	mg/L			456	72	71	
Total Ammonia	mg/L		0.97	1.15	0.044	0.023	5%
Nitrate	mg/L		2.9	5.8	0.19	0.10	7%
Nitrite	mg/L		0.018	0.45	0.016	0.009	85%
Alkalinity	mg/L			56	28	26	
OrthoPhosphate-P	mg/L			0.1734	0.0057	0.0035	
Phosphate-P	mg/L			0.1766	0.0277	0.0265	
Org. Carbon	mg/L			6.2	7.5	7.1	
Hardness CaCO3	mg/L			111	47	45	
Total Metals							
Aluminum Al	mg/L		0.1	0.15	0.08	0.25	83%
Antimony Sb	mg/L			0.0158	0.0032	0.0019	
Arsenic As	mg/L	0.5	0.005	0.00	0.0006	0.0006	11%
Barium Ba	mg/L			0.0108	0.0033	0.0052	
Beryllium Be	mg/L			0.00061	0.00003	0.00002	
Bismuth Bi	mg/L			0.01523	0.00047	0.00032	
Boron B	mg/L			0.032	0.034	0.030	
Cadmium Cd	mg/L		0.000038	0.000057	0.0000048	0.0000156	13%
Calcium Ca	mg/L			252	15	11	
Chromium Cr	mg/L		0.001	0.0067	0.0008	0.001	81%
Cobalt Co	mg/L			0.0105	0.0011	0.0005	
Copper Cu	mg/L	0.3	0.002	0.010	0.00174	0.0020	87%
Iron Fe	mg/L		0.3	0.18	0.13	0.28	42%
Lead Pb	mg/L	0.2	0.002	0.00040	0.00007	0.00026	4%
Lithium Li	mg/L			0.0049	0.0029	0.0029	
Magnesium Mg	mg/L			9.4	7.4	7.2	
Manganese Mn	mg/L			0.029	0.021	0.024	
Mercury Hg	mg/L		0.0001	0.0000117	0.00000092	0.0000008	1%
Molybdenum Mo	mg/L		0.073	0.0091	0.00041	0.00035	1%
Nickel Ni	mg/L	0.5	0.025	0.008	0.0008	0.0008	3%
Phosphorus P	mg/L			0.256	0.030	0.028	
Potassium K	mg/L			42	3.9	3.3	
Selenium Se	mg/L		0.001	0.00095	0.0009	0.00083	90%
Silicon SiO2	mg/L			4.0	0.61	0.56	
Silver Ag	mg/L		0.0001	0.00012	0.0000054	0.0000054	5%
Sodium Na	mg/L			178	43	40	
Strontium Sr	mg/L			0.090	0.043	0.046	
Tellurium Te	mg/L			0.050	0.050	0.051	
Thallium Tl	mg/L		0.0008	0.000043	0.000031	0.0020	4%
Thorium Th	mg/L			0.000042	0.0000024	0.0000012	
Tin Sn	mg/L			0.00241	0.00046	0.00004	
Titanium Ti	mg/L			0.0136	0.0062	0.0062	
Uranium U	mg/L			0.000070	0.000040	0.000044	
Vanadium V	mg/L			0.0035	0.0006	0.0005	
Zinc Zn	mg/L	0.5	0.03	0.023	0.0037	0.0054	12%
Zirconium Zr	mg/L			0.0051	0.0050	0.0051	

Table H-6-A-2
Scenario 6

Water Quality in TAIL LAKE

Date		Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter													
TDS	mg/L	92	124	156	187	207	238	269	297	320	343	365	384
TSS	mg/L	1.6	1.6	1.6	2.0	2.0	2.1	2.2	2.3	2.3	2.3	2.3	2.3
Free CN	mg/L	0.00050	0.00096	0.00141	0.00032	0.00042	0.00043	0.00042	0.00044	0.00085	0.00126	0.00164	0.00197
Total CN	mg/L	0.006	0.010	0.015	0.003	0.004	0.004	0.004	0.004	0.008	0.012	0.016	0.019
WAD CN	mg/L	0.0007	0.0013	0.0019	0.0004	0.0006	0.0006	0.0006	0.0006	0.0011	0.0017	0.0022	0.0026
CNO	mg/L	0.55	1.06	1.55	0.35	0.46	0.48	0.46	0.49	0.94	1.38	1.81	2.17
SCN	mg/L	0.008	0.014	0.021	0.025	0.029	0.035	0.041	0.047	0.052	0.057	0.062	0.066
Sulphate	mg/L	7.5	13.4	19.3	24.7	28.8	34.5	40.1	45.3	49.6	53.8	57.9	61.3
Chloride	mg/L	37	57	77	102	119	140	162	180	193	207	221	232
Total Ammonia	mg/L	0.070	0.133	0.194	0.615	0.172	0.229	0.235	0.221	0.272	0.323	0.371	0.413
Nitrate	mg/L	0.35	0.58	0.80	1.49	1.95	2.38	2.83	3.18	3.30	3.43	3.55	3.64
Nitrite	mg/L	0.054	0.102	0.150	0.208	0.201	0.205	0.205	0.208	0.247	0.286	0.322	0.354
Alkalinity	mg/L	16	18	21	25	27	30	33	35	37	38	40	41
OrthoPhosphate-P	mg/L	0.0107	0.0195	0.0282	0.0338	0.0387	0.0467	0.0543	0.0619	0.0683	0.0747	0.0809	0.0862
Phosphate-P	mg/L	0.0142	0.0229	0.0315	0.0378	0.0424	0.0504	0.0579	0.0655	0.0718	0.0781	0.0842	0.0894
Org. Carbon	mg/L	3.0	2.9	2.8	3.4	3.5	3.5	3.6	3.6	3.5	3.4	3.3	3.2
Hardness CaCO3	mg/L	23	29	35	42	46	52	58	63	67	71	75	78
Total Metals													
Aluminum Al	mg/L	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Antimony Sb	mg/L	0.0007	0.0012	0.0018	0.0035	0.0045	0.0053	0.0062	0.0068	0.0071	0.0074	0.0078	0.0080
Arsenic As	mg/L	0.0003	0.0004	0.0006	0.0008	0.0010	0.0011	0.0013	0.0015	0.0016	0.0017	0.0018	0.0019
Barium Ba	mg/L	0.0015	0.0022	0.0028	0.0034	0.0038	0.0045	0.0051	0.0057	0.0061	0.0065	0.0070	0.0073
Beryllium Be	mg/L	0.00012	0.00014	0.00016	0.00024	0.00027	0.00030	0.00033	0.00035	0.00036	0.00037	0.00037	0.00038
Bismuth Bi	mg/L	0.00057	0.00108	0.00159	0.00332	0.00428	0.00505	0.00590	0.00644	0.00673	0.00703	0.00732	0.00756
Boron B	mg/L	0.007	0.008	0.009	0.012	0.014	0.016	0.017	0.018	0.019	0.019	0.020	0.021
Cadmium Cd	mg/L	0.0000044	0.0000075	0.0000105	0.0000161	0.0000195	0.0000231	0.0000268	0.0000298	0.0000318	0.0000338	0.0000358	0.0000375
Calcium Ca	mg/L	21	38	54	66	75	91	105	120	132	144	156	166
Chromium Cr	mg/L	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.003	0.004	0.004	0.004	0.004
Cobalt Co	mg/L	0.0008	0.0015	0.0022	0.0027	0.0031	0.0038	0.0044	0.0050	0.0055	0.0060	0.0065	0.0069
Copper Cu	mg/L	0.0011	0.0017	0.0023	0.0028	0.0032	0.0037	0.0043	0.0048	0.0052	0.0056	0.0060	0.0064
Iron Fe	mg/L	0.02	0.02	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Lead Pb	mg/L	0.00005	0.00007	0.00009	0.00013	0.00016	0.00018	0.00021	0.00023	0.00024	0.00025	0.00026	0.00027
Lithium Li	mg/L	0.0019	0.0020	0.0022	0.0027	0.0029	0.0031	0.0033	0.0035	0.0036	0.0036	0.0037	0.0038
Magnesium Mg	mg/L	2.5	2.9	3.3	4.1	4.5	5.0	5.5	5.9	6.1	6.4	6.6	6.9
Manganese Mn	mg/L	0.002	0.004	0.006	0.008	0.009	0.011	0.012	0.014	0.015	0.017	0.018	0.019
Mercury Hg	mg/L	0.0000006	0.0000010	0.0000013	0.0000018	0.0000021	0.0000025	0.0000029	0.0000032	0.0000034	0.0000036	0.0000038	0.0000039
Molybdenum Mo	mg/L	0.00072	0.00134	0.00194	0.00234	0.00269	0.00324	0.00378	0.00431	0.00475	0.00520	0.00563	0.00600
Nickel Ni	mg/L	0.0008	0.0013	0.0019	0.0024	0.0028	0.0033	0.0038	0.0042	0.0046	0.0049	0.0053	0.0056
Phosphorus P	mg/L	0.020	0.033	0.047	0.061	0.070	0.083	0.097	0.109	0.118	0.128	0.138	0.146
Potassium K	mg/L	3.8	6.6	9.3	11.2	12.8	15.3	17.7	20.1	22.1	24.1	26.1	27.7
Selenium Se	mg/L	0.00022	0.00023	0.00024	0.00030	0.00031	0.00033	0.00035	0.00037	0.00037	0.00037	0.00038	0.00038
Silicon SiO2	mg/L	0.70	0.92	1.14	1.41	1.56	1.79	2.01	2.21	2.36	2.51	2.66	2.79
Silver Ag	mg/L	0.0000525	0.0000537	0.0000548	0.0000732	0.0000786	0.0000815	0.0000850	0.0000867	0.0000865	0.0000866	0.0000867	0.0000868
Sodium Na	mg/L	11	13	16	19	20	23	26	28	29	31	33	34
Strontium Sr	mg/L	0.017	0.021	0.026	0.032	0.035	0.040	0.045	0.050	0.053	0.057	0.060	0.063
Tellurium Te	mg/L	0.025	0.024	0.024	0.028	0.028	0.029	0.030	0.030	0.029	0.028	0.027	0.027
Thallium Tl	mg/L	0.000017	0.000018	0.000019	0.000024	0.000026	0.000028	0.000030	0.000031	0.000032	0.000032	0.000033	0.000033
Thorium Th	mg/L				0.000007	0.000011	0.000012	0.000014	0.000015	0.000014	0.000014	0.000014	0.000013
Tin Sn	mg/L	0.00013	0.00021	0.00028	0.00056	0.00072	0.00084	0.00098	0.00106	0.00110	0.00114	0.00118	0.00122
Titanium Ti	mg/L	0.0030	0.0030	0.0029	0.0036	0.0037	0.0038	0.0040	0.0040	0.0039	0.0038	0.0038	0.0037
Uranium U	mg/L	0.000025	0.000025	0.000024	0.000036	0.000040	0.000041	0.000043	0.000043	0.000042	0.000041	0.000040	0.000039
Vanadium V	mg/L	0.0004	0.0006	0.0007	0.0011	0.0013	0.0015	0.0017	0.0018	0.0019	0.0020	0.0021	0.0021
Zinc Zn	mg/L	0.0020	0.0034	0.0049	0.0062	0.0071	0.0085	0.0101	0.0114	0.0124	0.0135	0.0145	0.0153
Zirconium Zr	mg/L	0.0025	0.0024	0.0023	0.0030	0.0030	0.0031	0.0032	0.0032	0.0031	0.0031	0.0030	0.0029

Table H-6-A-2
Scenario 6

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter													
TDS	mg/L	405	424	442	439	434	458	481	501	515	530	544	556
TSS	mg/L	2.3	2.3	2.4	2.5	2.5	2.6	2.7	2.7	2.7	2.7	2.7	2.7
Free CN	mg/L	0.00233	0.00266	0.00298	0.00014	0.00036	0.00036	0.00035	0.00037	0.00071	0.00105	0.00137	0.00166
Total CN	mg/L	0.023	0.026	0.029	0.002	0.004	0.004	0.003	0.004	0.007	0.010	0.013	0.016
WAD CN	mg/L	0.0031	0.0035	0.0040	0.0002	0.0005	0.0005	0.0005	0.0005	0.0009	0.0014	0.0018	0.0022
CNO	mg/L	2.57	2.93	3.28	0.15	0.39	0.40	0.39	0.40	0.78	1.15	1.51	1.82
SCN	mg/L	0.071	0.075	0.079	0.077	0.075	0.080	0.084	0.088	0.092	0.095	0.098	0.101
Sulphate	mg/L	65.2	68.7	72.1	71.3	70.7	75.1	79.3	83.0	85.5	88.2	90.9	93.1
Chloride	mg/L	245	256	268	270	270	286	302	314	322	331	340	347
Total Ammonia	mg/L	0.458	0.499	0.540	1.145	0.073	0.195	0.196	0.184	0.227	0.270	0.312	0.348
Nitrate	mg/L	3.76	3.85	3.95	4.47	4.60	5.07	5.38	5.63	5.66	5.70	5.75	5.78
Nitrite	mg/L	0.389	0.420	0.451	0.191	0.181	0.044	0.189	0.187	0.219	0.252	0.283	0.311
Alkalinity	mg/L	43	44	46	47	46	49	51	52	53	54	55	56
OrthoPhosphate-P	mg/L	0.0921	0.0973	0.1025	0.0998	0.0982	0.1043	0.1099	0.1153	0.1192	0.1235	0.1276	0.1310
Phosphate-P	mg/L	0.0953	0.1004	0.1055	0.1033	0.1016	0.1077	0.1133	0.1186	0.1225	0.1266	0.1307	0.1341
Org. Carbon	mg/L	3.1	3.1	3.0	3.4	3.5	3.5	3.6	3.6	3.5	3.4	3.3	3.3
Hardness CaCO3	mg/L	82	85	89	89	88	93	97	101	103	106	108	111
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05
Antimony Sb	mg/L	0.0083	0.0086	0.0088	0.0096	0.0099	0.0105	0.0112	0.0116	0.0117	0.0119	0.0121	0.0122
Arsenic As	mg/L	0.0020	0.0021	0.0022	0.0022	0.0022	0.0023	0.0025	0.0026	0.0026	0.0027	0.0028	0.0028
Barium Ba	mg/L	0.0078	0.0081	0.0085	0.0084	0.0083	0.0088	0.0093	0.0097	0.0100	0.0102	0.0105	0.0108
Beryllium Be	mg/L	0.00039	0.00040	0.00041	0.00045	0.00046	0.00048	0.00050	0.00052	0.00052	0.00052	0.00053	0.00053
Bismuth Bi	mg/L	0.00785	0.00809	0.00833	0.00908	0.00938	0.00998	0.01063	0.01100	0.01112	0.01127	0.01142	0.01154
Boron B	mg/L	0.021	0.022	0.022	0.023	0.024	0.025	0.026	0.027	0.027	0.028	0.028	0.028
Cadmium Cd	mg/L	0.0000394	0.0000410	0.0000427	0.0000441	0.0000445	0.0000473	0.0000501	0.0000521	0.0000532	0.0000545	0.0000557	0.0000567
Calcium Ca	mg/L	177	187	197	192	189	201	212	222	229	237	245	252
Chromium Cr	mg/L	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.006	0.006	0.006	0.007	0.007
Cobalt Co	mg/L	0.0074	0.0078	0.0082	0.0080	0.0079	0.0084	0.0089	0.0093	0.0096	0.0099	0.0102	0.0105
Copper Cu	mg/L	0.0068	0.0071	0.0075	0.0074	0.0073	0.0077	0.0081	0.0085	0.0087	0.0090	0.0093	0.0095
Iron Fe	mg/L	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00029	0.00030	0.00031	0.00032	0.00033	0.00035	0.00036	0.00038	0.00038	0.00039	0.00040	0.00040
Lithium Li	mg/L	0.0039	0.0040	0.0040	0.0043	0.0043	0.0044	0.0046	0.0047	0.0048	0.0048	0.0049	0.0049
Magnesium Mg	mg/L	7.1	7.3	7.5	7.8	7.8	8.2	8.5	8.8	8.9	9.1	9.2	9.4
Manganese Mn	mg/L	0.020	0.021	0.023	0.022	0.022	0.023	0.025	0.026	0.027	0.027	0.028	0.029
Mercury Hg	mg/L	0.0000041	0.0000043	0.0000045	0.0000046	0.0000046	0.0000049	0.0000052	0.0000054	0.0000055	0.0000056	0.0000057	0.0000058
Molybdenum Mo	mg/L	0.00641	0.00677	0.00713	0.00695	0.00684	0.00727	0.00766	0.00803	0.00831	0.00860	0.00889	0.00913
Nickel Ni	mg/L	0.0059	0.0062	0.0065	0.0065	0.0065	0.0068	0.0072	0.0075	0.0078	0.0080	0.0082	0.0084
Phosphorus P	mg/L	0.155	0.163	0.171	0.169	0.168	0.178	0.188	0.197	0.202	0.209	0.215	0.220
Potassium K	mg/L	29.6	31.2	32.8	32.0	31.6	33.5	35.3	37.0	38.2	39.5	40.8	41.9
Selenium Se	mg/L	0.00039	0.00039	0.00039	0.00043	0.00043	0.00045	0.00046	0.00047	0.00047	0.00047	0.00047	0.00047
Silicon SiO2	mg/L	2.93	3.05	3.18	3.19	3.17	3.34	3.51	3.65	3.74	3.84	3.93	4.01
Silver Ag	mg/L	0.0000871	0.0000871	0.0000873	0.0000987	0.0001010	0.0001035	0.0001063	0.0001073	0.0001066	0.0001062	0.0001058	0.0001055
Sodium Na	mg/L	36	37	38	39	38	40	42	44	45	46	47	48
Strontium Sr	mg/L	0.066	0.069	0.071	0.071	0.071	0.075	0.079	0.082	0.084	0.086	0.088	0.090
Tellurium Te	mg/L	0.026	0.025	0.025	0.028	0.029	0.029	0.030	0.030	0.029	0.028	0.028	0.027
Thallium Tl	mg/L	0.000034	0.000034	0.000035	0.000037	0.000038	0.000039	0.000041	0.000042	0.000042	0.000042	0.000043	0.000043
Thorium Th	mg/L	0.000013	0.000013	0.000012	0.000017	0.000019	0.000020	0.000022	0.000022	0.000022	0.000021	0.000021	0.000020
Tin Sn	mg/L	0.00126	0.00129	0.00132	0.00145	0.00151	0.00160	0.00171	0.00176	0.00178	0.00180	0.00182	0.00183
Titanium Ti	mg/L	0.0037	0.0036	0.0036	0.0040	0.0041	0.0042	0.0043	0.0043	0.0042	0.0042	0.0041	0.0041
Uranium U	mg/L	0.000039	0.000038	0.000037	0.000045	0.000048	0.000049	0.000050	0.000050	0.000049	0.000048	0.000047	0.000047
Vanadium V	mg/L	0.0022	0.0023	0.0024	0.0025	0.0026	0.0027	0.0028	0.0029	0.0030	0.0030	0.0031	0.0031
Zinc Zn	mg/L	0.0163	0.0171	0.0179	0.0177	0.0175	0.0186	0.0197	0.0207	0.0213	0.0220	0.0226	0.0231
Zirconium Zr	mg/L	0.0028	0.0028	0.0027	0.0032	0.0032	0.0033	0.0034	0.0034	0.0033	0.0032	0.0032	0.0031

Table H-6-A-2
Scenario 6

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter													
TDS	mg/L	563	575	586	570	549	563	575	584	594	604	615	625
TSS	mg/L	2.7	2.7	2.7	2.8	2.7	2.7	2.8	2.8	2.7	2.7	2.7	2.7
Free CN	mg/L	0.00163	0.00162	0.00161									
Total CN	mg/L	0.016	0.016	0.016			0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L	0.0022	0.0022	0.0021									
CNO	mg/L	1.80	1.78	1.77									
SCN	mg/L	0.099	0.099	0.098	0.091	0.084	0.084	0.083	0.082	0.082	0.081	0.081	0.080
Sulphate	mg/L	92.1	91.9	91.7	86.7	81.6	81.9	82.1	81.7	81.3	81.1	81.0	80.9
Chloride	mg/L	356	369	381	378	372	387	401	412	422	434	445	456
Total Ammonia	mg/L	0.350	0.355	0.360	0.618	0.006	0.017	0.020	0.012	0.019	0.026	0.033	0.039
Nitrate	mg/L	5.62	5.53	5.43	5.57	5.36	5.57	5.65	5.65	5.54	5.44	5.35	5.26
Nitrite	mg/L	0.326	0.343	0.360	0.142	0.153	0.019	0.022	0.022	0.040	0.059	0.077	0.093
Alkalinity	mg/L	55	55	55	53	51	51	51	51	50	50	50	49
OrthoPhosphate-P	mg/L	0.1355	0.1410	0.1465	0.1423	0.1384	0.1440	0.1490	0.1537	0.1584	0.1635	0.1687	0.1734
Phosphate-P	mg/L	0.1386	0.1440	0.1495	0.1458	0.1417	0.1474	0.1524	0.1570	0.1617	0.1668	0.1719	0.1766
Org. Carbon	mg/L	3.2	3.2	3.2	3.6	3.6	3.7	3.8	3.7	3.7	3.7	3.7	3.6
Hardness CaCO3	mg/L	109	108	107	103	98	98	98	97	96	95	95	94
Total Metals													
Aluminum Al	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Antimony Sb	mg/L	0.0124	0.0127	0.0129	0.0134	0.0134	0.0139	0.0145	0.0148	0.0151	0.0153	0.0156	0.0158
Arsenic As	mg/L	0.0028	0.0028	0.0028	0.0026	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
Barium Ba	mg/L	0.0106	0.0106	0.0105	0.0100	0.0094	0.0094	0.0094	0.0094	0.0093	0.0093	0.0092	0.0092
Beryllium Be	mg/L	0.00053	0.00054	0.00054	0.00056	0.00056	0.00057	0.00059	0.00059	0.00060	0.00060	0.00061	0.00061
Bismuth Bi	mg/L	0.01173	0.01202	0.01230	0.01278	0.01281	0.01336	0.01394	0.01425	0.01448	0.01473	0.01499	0.01523
Boron B	mg/L	0.028	0.028	0.028	0.028	0.027	0.028	0.028	0.028	0.028	0.028	0.028	0.028
Cadmium Cd	mg/L	0.0000558	0.0000555	0.0000552	0.0000529	0.0000502	0.0000503	0.0000505	0.0000502	0.0000498	0.0000494	0.0000492	0.0000489
Calcium Ca	mg/L	248	246	245	228	212	211	210	208	206	205	204	203
Chromium Cr	mg/L	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
Cobalt Co	mg/L	0.0104	0.0103	0.0103	0.0096	0.0090	0.0090	0.0089	0.0089	0.0088	0.0088	0.0087	0.0087
Copper Cu	mg/L	0.0094	0.0093	0.0093	0.0087	0.0082	0.0082	0.0081	0.0081	0.0080	0.0079	0.0079	0.0079
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00040	0.00040	0.00040	0.00040	0.00039	0.00039	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040
Lithium Li	mg/L	0.0048	0.0048	0.0048	0.0049	0.0047	0.0048	0.0048	0.0048	0.0048	0.0048	0.0048	0.0048
Magnesium Mg	mg/L	9.2	9.2	9.2	9.1	8.8	8.9	8.9	8.9	8.9	8.8	8.8	8.8
Manganese Mn	mg/L	0.029	0.028	0.028	0.027	0.025	0.025	0.025	0.025	0.024	0.024	0.024	0.024
Mercury Hg	mg/L	0.0000058	0.0000057	0.0000057	0.0000055	0.0000052	0.0000052	0.0000053	0.0000052	0.0000052	0.0000052	0.0000051	0.0000051
Molybdenum Mo	mg/L	0.00899	0.00894	0.00888	0.00826	0.00769	0.00765	0.00760	0.00752	0.00746	0.00741	0.00737	0.00733
Nickel Ni	mg/L	0.0083	0.0083	0.0083	0.0079	0.0074	0.0075	0.0075	0.0075	0.0074	0.0074	0.0074	0.0074
Phosphorus P	mg/L	0.224	0.229	0.235	0.228	0.220	0.226	0.232	0.236	0.241	0.246	0.251	0.256
Potassium K	mg/L	41.3	41.0	40.7	38.0	35.4	35.2	35.0	34.6	34.3	34.1	33.9	33.7
Selenium Se	mg/L	0.00047	0.00046	0.00046	0.00048	0.00046	0.00047	0.00047	0.00047	0.00046	0.00046	0.00046	0.00046
Silicon SiO2	mg/L	3.95	3.93	3.91	3.74	3.53	3.53	3.53	3.50	3.47	3.45	3.43	3.42
Silver Ag	mg/L	0.0001046	0.0001046	0.0001047	0.0001120	0.0001117	0.0001128	0.0001140	0.0001139	0.0001137	0.0001136	0.0001135	0.0001136
Sodium Na	mg/L	47	47	46	45	42	42	42	42	42	41	41	41
Strontium Sr	mg/L	0.089	0.088	0.088	0.084	0.079	0.079	0.080	0.079	0.078	0.078	0.078	0.077
Tellurium Te	mg/L	0.027	0.026	0.026	0.029	0.030	0.030	0.031	0.031	0.031	0.030	0.030	0.030
Thallium Tl	mg/L	0.000042	0.000042	0.000042	0.000042	0.000041	0.000041	0.000042	0.000042	0.000041	0.000041	0.000041	0.000040
Thorium Th	mg/L	0.000020	0.000020	0.000020	0.000021	0.000022	0.000022	0.000023	0.000023	0.000023	0.000023	0.000023	0.000023
Tin Sn	mg/L	0.00186	0.00190	0.00194	0.00202	0.00204	0.00212	0.00222	0.00226	0.00230	0.00233	0.00237	0.00241
Titanium Ti	mg/L	0.0040	0.0040	0.0040	0.0044	0.0044	0.0045	0.0046	0.0046	0.0046	0.0046	0.0046	0.0046
Uranium U	mg/L	0.000046	0.000046	0.000046	0.000051	0.000051	0.000052	0.000053	0.000053	0.000052	0.000052	0.000052	0.000052
Vanadium V	mg/L	0.0031	0.0032	0.0032	0.0032	0.0032	0.0033	0.0033	0.0034	0.0034	0.0034	0.0035	0.0035
Zinc Zn	mg/L	0.0228	0.0228	0.0227	0.0214	0.0201	0.0201	0.0202	0.0201	0.0200	0.0199	0.0199	0.0198
Zirconium Zr	mg/L	0.0030	0.0030	0.0030	0.0034	0.0034	0.0035	0.0035	0.0035	0.0035	0.0035	0.0034	0.0034

Table H-6-A-2
Scenario 6

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter													
TDS	mg/L	622	620	618	588	555	555	555	551	548	545	543	542
TSS	mg/L	2.7	2.7	2.7	2.8	2.7	2.8	2.8	2.8	2.8	2.8	2.7	2.7
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.080	0.079	0.079	0.074	0.069	0.069	0.069	0.068	0.068	0.067	0.067	0.067
Sulphate	mg/L	80.5	80.3	80.0	74.9	70.2	70.1	69.9	69.3	68.9	68.6	68.4	68.2
Chloride	mg/L	454	452	451	424	398	398	397	393	391	390	388	387
Total Ammonia	mg/L	0.039	0.039	0.039	0.015	0.010	0.004	0.006	0.002	0.002	0.002	0.002	0.002
Nitrate	mg/L	5.17	5.08	4.99	4.89	4.65	4.68	4.70	4.68	4.59	4.50	4.42	4.34
Nitrite	mg/L	0.093	0.093	0.092	0.001	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001
Alkalinity	mg/L	49	49	49	48	46	46	47	46	46	46	46	46
OrthoPhosphate-P	mg/L	0.1725	0.1719	0.1713	0.1602	0.1499	0.1497	0.1490	0.1478	0.1470	0.1463	0.1458	0.1455
Phosphate-P	mg/L	0.1757	0.1752	0.1745	0.1639	0.1535	0.1533	0.1526	0.1514	0.1505	0.1499	0.1494	0.1490
Org. Carbon	mg/L	3.6	3.6	3.6	3.9	4.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Hardness CaCO3	mg/L	94	93	93	90	86	86	87	86	86	85	85	85
Total Metals													
Aluminum Al	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Antimony Sb	mg/L	0.0157	0.0157	0.0156	0.0146	0.0137	0.0137	0.0136	0.0135	0.0134	0.0134	0.0133	0.0133
Arsenic As	mg/L	0.0025	0.0025	0.0024	0.0023	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022
Barium Ba	mg/L	0.0091	0.0091	0.0091	0.0086	0.0082	0.0082	0.0082	0.0081	0.0081	0.0081	0.0080	0.0080
Beryllium Be	mg/L	0.00061	0.00061	0.00060	0.00059	0.00056	0.00056	0.00056	0.00056	0.00056	0.00055	0.00055	0.00055
Bismuth Bi	mg/L	0.01515	0.01510	0.01505	0.01407	0.01316	0.01314	0.01308	0.01297	0.01290	0.01284	0.01280	0.01277
Boron B	mg/L	0.028	0.028	0.028	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.026	0.026
Cadmium Cd	mg/L	0.0000487	0.0000485	0.0000484	0.0000468	0.0000447	0.0000450	0.0000453	0.0000451	0.0000448	0.0000446	0.0000445	0.0000444
Calcium Ca	mg/L	202	201	200	188	176	175	175	173	172	172	171	171
Chromium Cr	mg/L	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Cobalt Co	mg/L	0.0086	0.0086	0.0086	0.0080	0.0075	0.0075	0.0075	0.0074	0.0074	0.0073	0.0073	0.0073
Copper Cu	mg/L	0.0078	0.0078	0.0078	0.0074	0.0069	0.0069	0.0069	0.0069	0.0068	0.0068	0.0068	0.0068
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00040	0.00040	0.00040	0.00038	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036
Lithium Li	mg/L	0.0047	0.0047	0.0047	0.0047	0.0046	0.0046	0.0047	0.0046	0.0046	0.0046	0.0046	0.0046
Magnesium Mg	mg/L	8.8	8.7	8.7	8.5	8.2	8.2	8.3	8.2	8.2	8.2	8.1	8.1
Manganese Mn	mg/L	0.024	0.024	0.024	0.022	0.021	0.021	0.021	0.021	0.021	0.020	0.020	0.020
Mercury Hg	mg/L	0.0000051	0.0000051	0.0000051	0.0000049	0.0000047	0.0000047	0.0000047	0.0000047	0.0000047	0.0000047	0.0000046	0.0000046
Molybdenum Mo	mg/L	0.00730	0.00727	0.00725	0.00678	0.00634	0.00633	0.00631	0.00625	0.00622	0.00619	0.00617	0.00616
Nickel Ni	mg/L	0.0074	0.0073	0.0073	0.0069	0.0065	0.0065	0.0064	0.0064	0.0063	0.0063	0.0063	0.0063
Phosphorus P	mg/L	0.254	0.254	0.253	0.238	0.223	0.223	0.222	0.221	0.219	0.218	0.218	0.217
Potassium K	mg/L	33.5	33.4	33.3	31.3	29.3	29.3	29.2	29.0	28.8	28.7	28.6	28.5
Selenium Se	mg/L	0.00045	0.00045	0.00045	0.00046	0.00046	0.00046	0.00047	0.00046	0.00046	0.00046	0.00046	0.00046
Silicon SiO2	mg/L	3.40	3.39	3.38	3.26	3.09	3.10	3.11	3.09	3.07	3.06	3.05	3.04
Silver Ag	mg/L	0.0001130	0.0001127	0.0001123	0.0001163	0.0001142	0.0001146	0.0001147	0.0001140	0.0001134	0.0001129	0.0001125	0.0001122
Sodium Na	mg/L	41	41	40	39	38	38	38	38	37	37	37	37
Strontium Sr	mg/L	0.077	0.077	0.076	0.073	0.070	0.070	0.070	0.070	0.069	0.069	0.069	0.069
Tellurium Te	mg/L	0.030	0.030	0.030	0.032	0.033	0.033	0.034	0.034	0.034	0.034	0.033	0.033
Thallium Tl	mg/L	0.000040	0.000040	0.000040	0.000041	0.000040	0.000040	0.000041	0.000041	0.000040	0.000040	0.000040	0.000040
Thorium Th	mg/L	0.000022	0.000022	0.000022	0.000024	0.000024	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025
Tin Sn	mg/L	0.00239	0.00239	0.00238	0.00224	0.00211	0.00211	0.00211	0.00209	0.00208	0.00207	0.00206	0.00206
Titanium Ti	mg/L	0.0045	0.0045	0.0045	0.0048	0.0047	0.0048	0.0049	0.0049	0.0049	0.0048	0.0048	0.0048
Uranium U	mg/L	0.000051	0.000051	0.000051	0.000055	0.000056	0.000056	0.000057	0.000057	0.000057	0.000057	0.000056	0.000056
Vanadium V	mg/L	0.0035	0.0035	0.0034	0.0033	0.0031	0.0031	0.0031	0.0031	0.0030	0.0030	0.0030	0.0030
Zinc Zn	mg/L	0.0197	0.0197	0.0196	0.0184	0.0173	0.0173	0.0174	0.0173	0.0172	0.0171	0.0170	0.0170
Zirconium Zr	mg/L	0.0034	0.0034	0.0034	0.0037	0.0037	0.0038	0.0039	0.0039	0.0039	0.0038	0.0038	0.0038

Table H-6-A-2
Scenario 6

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter													
TDS	mg/L	541	539	537	513	486	486	486	483	480	478	477	476
TSS	mg/L	2.7	2.7	2.7	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.067	0.067	0.066	0.062	0.058	0.058	0.058	0.058	0.057	0.057	0.057	0.057
Sulphate	mg/L	68.0	67.8	67.6	63.5	59.6	59.6	59.4	58.9	58.6	58.4	58.2	58.0
Chloride	mg/L	386	385	384	362	341	341	340	337	336	334	333	332
Total Ammonia	mg/L	0.002	0.002	0.002	0.017	0.010	0.004	0.006	0.002	0.002	0.002	0.002	0.002
Nitrate	mg/L	4.26	4.18	4.10	3.97	3.80	3.83	3.86	3.84	3.75	3.67	3.59	3.52
Nitrite	mg/L	0.001	0.001	0.001	0.003	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001
Alkalinity	mg/L	46	45	45	45	43	43	44	43	43	43	43	43
OrthoPhosphate-P	mg/L	0.1451	0.1447	0.1441	0.1351	0.1267	0.1266	0.1261	0.1250	0.1244	0.1238	0.1234	0.1231
Phosphate-P	mg/L	0.1486	0.1482	0.1476	0.1390	0.1305	0.1304	0.1299	0.1288	0.1281	0.1276	0.1272	0.1269
Org. Carbon	mg/L	4.0	4.0	4.0	4.3	4.3	4.4	4.5	4.5	4.4	4.4	4.4	4.4
Hardness CaCO3	mg/L	85	84	84	82	78	79	79	79	78	78	78	77
Total Metals													
Aluminum Al	mg/L	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0132	0.0132	0.0132	0.0123	0.0116	0.0116	0.0115	0.0114	0.0114	0.0113	0.0113	0.0113
Arsenic As	mg/L	0.0022	0.0022	0.0021	0.0021	0.0020	0.0020	0.0020	0.0020	0.0019	0.0019	0.0019	0.0019
Barium Ba	mg/L	0.0080	0.0080	0.0079	0.0076	0.0072	0.0072	0.0072	0.0072	0.0071	0.0071	0.0071	0.0071
Beryllium Be	mg/L	0.00055	0.00055	0.00055	0.00053	0.00051	0.00051	0.00051	0.00051	0.00051	0.00050	0.00050	0.00050
Bismuth Bi	mg/L	0.01274	0.01269	0.01265	0.01185	0.01111	0.01110	0.01105	0.01096	0.01090	0.01086	0.01082	0.01079
Boron B	mg/L	0.026	0.026	0.026	0.026	0.025	0.025	0.026	0.025	0.025	0.025	0.025	0.025
Cadmium Cd	mg/L	0.0000443	0.0000441	0.0000440	0.0000427	0.0000409	0.0000413	0.0000416	0.0000414	0.0000412	0.0000410	0.0000409	0.0000408
Calcium Ca	mg/L	170	170	169	159	149	149	149	147	147	146	145	145
Chromium Cr	mg/L	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Cobalt Co	mg/L	0.0073	0.0073	0.0072	0.0068	0.0064	0.0064	0.0063	0.0063	0.0063	0.0062	0.0062	0.0062
Copper Cu	mg/L	0.0067	0.0067	0.0067	0.0064	0.0060	0.0060	0.0060	0.0059	0.0059	0.0059	0.0059	0.0059
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00036	0.00035	0.00035	0.00034	0.00032	0.00033	0.00033	0.00033	0.00032	0.00032	0.00032	0.00032
Lithium Li	mg/L	0.0045	0.0045	0.0045	0.0045	0.0044	0.0044	0.0045	0.0045	0.0044	0.0044	0.0044	0.0044
Magnesium Mg	mg/L	8.1	8.1	8.0	7.9	7.6	7.7	7.7	7.7	7.6	7.6	7.6	7.6
Manganese Mn	mg/L	0.020	0.020	0.020	0.019	0.018	0.018	0.018	0.018	0.018	0.017	0.017	0.017
Mercury Hg	mg/L	0.0000046	0.0000046	0.0000046	0.0000045	0.0000043	0.0000043	0.0000043	0.0000043	0.0000043	0.0000043	0.0000043	0.0000042
Molybdenum Mo	mg/L	0.00614	0.00612	0.00610	0.00572	0.00536	0.00536	0.00534	0.00529	0.00526	0.00524	0.00522	0.00521
Nickel Ni	mg/L	0.0063	0.0062	0.0062	0.0059	0.0055	0.0055	0.0055	0.0055	0.0055	0.0054	0.0054	0.0054
Phosphorus P	mg/L	0.217	0.216	0.215	0.203	0.191	0.191	0.191	0.189	0.188	0.187	0.187	0.186
Potassium K	mg/L	28.4	28.3	28.2	26.6	25.0	25.0	24.9	24.7	24.6	24.5	24.4	24.3
Selenium Se	mg/L	0.00046	0.00045	0.00045	0.00047	0.00046	0.00046	0.00047	0.00047	0.00046	0.00046	0.00046	0.00046
Silicon SiO2	mg/L	3.03	3.02	3.01	2.92	2.78	2.79	2.80	2.78	2.77	2.75	2.74	2.74
Silver Ag	mg/L	0.0001120	0.0001116	0.0001112	0.0001152	0.0001133	0.0001136	0.0001138	0.0001131	0.0001125	0.0001120	0.0001116	0.0001114
Sodium Na	mg/L	37	37	37	36	34	35	35	35	34	34	34	34
Strontium Sr	mg/L	0.069	0.068	0.068	0.066	0.063	0.063	0.063	0.063	0.063	0.062	0.062	0.062
Tellurium Te	mg/L	0.033	0.033	0.033	0.036	0.035	0.036	0.037	0.037	0.036	0.036	0.036	0.036
Thallium Tl	mg/L	0.000040	0.000040	0.000040	0.000040	0.000040	0.000040	0.000041	0.000040	0.000040	0.000040	0.000040	0.000040
Thorium Th	mg/L	0.000025	0.000025	0.000025	0.000026	0.000026	0.000027	0.000028	0.000028	0.000027	0.000027	0.000027	0.000027
Tin Sn	mg/L	0.00205	0.00205	0.00204	0.00192	0.00182	0.00182	0.00182	0.00181	0.00180	0.00179	0.00179	0.00178
Titanium Ti	mg/L	0.0048	0.0048	0.0048	0.0050	0.0050	0.0050	0.0051	0.0051	0.0051	0.0051	0.0050	0.0050
Uranium U	mg/L	0.000056	0.000056	0.000056	0.000060	0.000060	0.000060	0.000061	0.000061	0.000061	0.000060	0.000060	0.000060
Vanadium V	mg/L	0.0030	0.0030	0.0030	0.0028	0.0027	0.0027	0.0027	0.0027	0.0027	0.0026	0.0026	0.0026
Zinc Zn	mg/L	0.0169	0.0169	0.0168	0.0159	0.0149	0.0149	0.0150	0.0149	0.0148	0.0148	0.0147	0.0147
Zirconium Zr	mg/L	0.0038	0.0038	0.0038	0.0041	0.0040	0.0041	0.0042	0.0042	0.0042	0.0042	0.0041	0.0041

Table H-6-A-2
Scenario 6

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter													
TDS	mg/L	474	473	471	452	429	430	430	428	425	423	422	421
TSS	mg/L	2.8	2.8	2.8	2.9	2.8	2.8	2.9	2.9	2.9	2.8	2.8	2.8
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.056	0.056	0.056	0.053	0.049	0.049	0.049	0.049	0.049	0.048	0.048	0.048
Sulphate	mg/L	57.9	57.7	57.5	54.2	51.0	51.0	50.8	50.4	50.2	50.0	49.8	49.7
Chloride	mg/L	331	330	329	311	294	294	294	291	290	289	288	287
Total Ammonia	mg/L	0.002	0.002	0.002	0.016	0.009	0.004	0.006	0.002	0.002	0.002	0.002	0.002
Nitrate	mg/L	3.45	3.37	3.29	3.21	3.10	3.13	3.16	3.15	3.07	2.99	2.92	2.84
Nitrite	mg/L	0.001	0.001	0.001	0.003	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001
Alkalinity	mg/L	43	43	42	42	41	41	41	41	41	41	41	40
OrthoPhosphate-P	mg/L	0.1228	0.1224	0.1220	0.1146	0.1077	0.1076	0.1072	0.1064	0.1058	0.1054	0.1050	0.1048
Phosphate-P	mg/L	0.1266	0.1262	0.1257	0.1187	0.1117	0.1116	0.1112	0.1104	0.1098	0.1093	0.1090	0.1087
Org. Carbon	mg/L	4.4	4.4	4.4	4.6	4.6	4.7	4.8	4.7	4.7	4.7	4.7	4.7
Hardness CaCO3	mg/L	77	77	77	75	72	72	73	72	72	72	71	71
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0112	0.0112	0.0112	0.0105	0.0099	0.0099	0.0098	0.0098	0.0097	0.0097	0.0096	0.0096
Arsenic As	mg/L	0.0019	0.0019	0.0019	0.0018	0.0018	0.0018	0.0018	0.0018	0.0017	0.0017	0.0017	0.0017
Barium Ba	mg/L	0.0071	0.0070	0.0070	0.0067	0.0064	0.0064	0.0064	0.0064	0.0064	0.0063	0.0063	0.0063
Beryllium Be	mg/L	0.00050	0.00050	0.00050	0.00049	0.00047	0.00047	0.00047	0.00047	0.00047	0.00046	0.00046	0.00046
Bismuth Bi	mg/L	0.01077	0.01073	0.01070	0.01004	0.00943	0.00943	0.00939	0.00932	0.00927	0.00923	0.00920	0.00918
Boron B	mg/L	0.025	0.025	0.025	0.025	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024
Cadmium Cd	mg/L	0.0000407	0.0000405	0.0000404	0.0000394	0.0000379	0.0000382	0.0000385	0.0000384	0.0000382	0.0000380	0.0000379	0.0000378
Calcium Ca	mg/L	145	144	144	135	127	127	127	126	125	125	124	124
Chromium Cr	mg/L	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Cobalt Co	mg/L	0.0062	0.0062	0.0061	0.0058	0.0054	0.0054	0.0054	0.0054	0.0053	0.0053	0.0053	0.0053
Copper Cu	mg/L	0.0058	0.0058	0.0058	0.0055	0.0052	0.0052	0.0052	0.0052	0.0052	0.0052	0.0051	0.0051
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00032	0.00032	0.00032	0.00031	0.00029	0.00030	0.00030	0.00030	0.00029	0.00029	0.00029	0.00029
Lithium Li	mg/L	0.0044	0.0044	0.0044	0.0044	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043
Magnesium Mg	mg/L	7.5	7.5	7.5	7.4	7.1	7.2	7.2	7.2	7.2	7.1	7.1	7.1
Manganese Mn	mg/L	0.017	0.017	0.017	0.016	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015
Mercury Hg	mg/L	0.0000042	0.0000042	0.0000042	0.0000041	0.0000039	0.0000040	0.0000040	0.0000040	0.0000040	0.0000039	0.0000039	0.0000039
Molybdenum Mo	mg/L	0.00520	0.00518	0.00517	0.00485	0.00456	0.00456	0.00454	0.00451	0.00448	0.00446	0.00445	0.00444
Nickel Ni	mg/L	0.0054	0.0054	0.0053	0.0051	0.0048	0.0048	0.0048	0.0047	0.0047	0.0047	0.0047	0.0047
Phosphorus P	mg/L	0.186	0.185	0.185	0.175	0.165	0.165	0.164	0.163	0.162	0.162	0.161	0.161
Potassium K	mg/L	24.3	24.2	24.1	22.8	21.4	21.4	21.4	21.2	21.1	21.0	20.9	20.9
Selenium Se	mg/L	0.00046	0.00046	0.00045	0.00047	0.00046	0.00046	0.00047	0.00047	0.00046	0.00046	0.00046	0.00046
Silicon SiO2	mg/L	2.73	2.72	2.71	2.64	2.52	2.53	2.54	2.53	2.52	2.50	2.50	2.49
Silver Ag	mg/L	0.0001111	0.0001107	0.0001104	0.0001143	0.0001125	0.0001128	0.0001130	0.0001124	0.0001118	0.0001113	0.0001109	0.0001107
Sodium Na	mg/L	34	34	34	33	32	32	32	32	32	32	32	31
Strontium Sr	mg/L	0.062	0.062	0.061	0.060	0.057	0.057	0.058	0.057	0.057	0.057	0.057	0.056
Tellurium Te	mg/L	0.036	0.036	0.036	0.038	0.038	0.038	0.039	0.039	0.039	0.039	0.038	0.038
Thallium Tl	mg/L	0.000040	0.000040	0.000039	0.000040	0.000039	0.000040	0.000040	0.000040	0.000040	0.000040	0.000040	0.000040
Thorium Th	mg/L	0.000027	0.000027	0.000027	0.000028	0.000028	0.000029	0.000029	0.000029	0.000029	0.000029	0.000029	0.000029
Tin Sn	mg/L	0.00178	0.00177	0.00177	0.00167	0.00158	0.00159	0.00159	0.00158	0.00157	0.00156	0.00156	0.00155
Titanium Ti	mg/L	0.0050	0.0050	0.0050	0.0052	0.0052	0.0052	0.0053	0.0053	0.0053	0.0052	0.0052	0.0052
Uranium U	mg/L	0.000060	0.000060	0.000059	0.000063	0.000063	0.000063	0.000064	0.000064	0.000064	0.000063	0.000063	0.000063
Vanadium V	mg/L	0.0026	0.0026	0.0026	0.0025	0.0024	0.0024	0.0024	0.0024	0.0023	0.0023	0.0023	0.0023
Zinc Zn	mg/L	0.0147	0.0146	0.0146	0.0138	0.0130	0.0130	0.0131	0.0130	0.0130	0.0129	0.0129	0.0128
Zirconium Zr	mg/L	0.0041	0.0041	0.0041	0.0043	0.0043	0.0044	0.0045	0.0045	0.0044	0.0044	0.0044	0.0044

Table H-6-A-2
Scenario 6

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter													
TDS	mg/L	420	419	417	402	383	384	384	382	380	378	377	376
TSS	mg/L	2.8	2.8	2.8	2.9	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.9
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.048	0.048	0.048	0.045	0.042	0.042	0.042	0.042	0.041	0.041	0.041	0.041
Sulphate	mg/L	49.6	49.4	49.2	46.4	43.8	43.8	43.7	43.3	43.1	42.9	42.8	42.7
Chloride	mg/L	286	285	285	270	255	256	255	254	252	251	250	250
Total Ammonia	mg/L	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nitrate	mg/L	2.77	2.70	2.63	2.47	2.32	2.32	2.31	2.30	2.22	2.15	2.08	2.01
Nitrite	mg/L	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alkalinity	mg/L	40	40	40	40	39	39	39	39	39	39	39	39
OrthoPhosphate-P	mg/L	0.1045	0.1042	0.1039	0.0978	0.0921	0.0920	0.0917	0.0910	0.0905	0.0902	0.0899	0.0897
Phosphate-P	mg/L	0.1085	0.1081	0.1078	0.1020	0.0962	0.0962	0.0959	0.0951	0.0946	0.0943	0.0940	0.0937
Org. Carbon	mg/L	4.7	4.7	4.6	4.9	4.9	4.9	5.0	5.0	5.0	4.9	4.9	4.9
Hardness CaCO3	mg/L	71	71	71	69	67	67	68	67	67	67	66	66
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0096	0.0096	0.0095	0.0090	0.0084	0.0084	0.0084	0.0084	0.0083	0.0083	0.0083	0.0082
Arsenic As	mg/L	0.0017	0.0017	0.0017	0.0016	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Barium Ba	mg/L	0.0063	0.0063	0.0062	0.0060	0.0057	0.0058	0.0058	0.0057	0.0057	0.0057	0.0057	0.0057
Beryllium Be	mg/L	0.00046	0.00046	0.00046	0.00045	0.00043	0.00043	0.00043	0.00042	0.00042	0.00042	0.00042	0.00042
Bismuth Bi	mg/L	0.00915	0.00913	0.00910	0.00855	0.00804	0.00804	0.00801	0.00795	0.00790	0.00787	0.00785	0.00783
Boron B	mg/L	0.024	0.024	0.024	0.023	0.023	0.023	0.023	0.023	0.023	0.022	0.022	0.022
Cadmium Cd	mg/L	0.0000377	0.0000376	0.0000375	0.0000354	0.0000334	0.0000334	0.0000333	0.0000330	0.0000329	0.0000327	0.0000326	0.0000326
Calcium Ca	mg/L	124	124	123	116	109	109	109	108	108	107	107	107
Chromium Cr	mg/L	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Cobalt Co	mg/L	0.0053	0.0053	0.0052	0.0049	0.0046	0.0046	0.0046	0.0046	0.0046	0.0045	0.0045	0.0045
Copper Cu	mg/L	0.0051	0.0051	0.0051	0.0048	0.0046	0.0046	0.0046	0.0046	0.0045	0.0045	0.0045	0.0045
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00029	0.00029	0.00029	0.00028	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026
Lithium Li	mg/L	0.0043	0.0042	0.0042	0.0043	0.0041	0.0042	0.0042	0.0042	0.0042	0.0042	0.0042	0.0041
Magnesium Mg	mg/L	7.1	7.1	7.0	7.0	6.7	6.8	6.9	6.8	6.8	6.8	6.7	6.7
Manganese Mn	mg/L	0.015	0.015	0.015	0.014	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013
Mercury Hg	mg/L	0.0000039	0.0000039	0.0000039	0.0000037	0.0000035	0.0000035	0.0000035	0.0000035	0.0000035	0.0000035	0.0000034	0.0000034
Molybdenum Mo	mg/L	0.00443	0.00441	0.00440	0.00414	0.00390	0.00390	0.00389	0.00386	0.00384	0.00382	0.00381	0.00380
Nickel Ni	mg/L	0.0047	0.0046	0.0046	0.0044	0.0042	0.0042	0.0041	0.0041	0.0041	0.0041	0.0041	0.0041
Phosphorus P	mg/L	0.160	0.160	0.159	0.151	0.142	0.142	0.141	0.140	0.139	0.139	0.138	0.138
Potassium K	mg/L	20.9	20.8	20.7	19.6	18.5	18.5	18.5	18.3	18.2	18.2	18.1	18.1
Selenium Se	mg/L	0.00046	0.00046	0.00046	0.00046	0.00045	0.00046	0.00046	0.00046	0.00045	0.00045	0.00045	0.00045
Silicon SiO2	mg/L	2.48	2.48	2.47	2.40	2.29	2.30	2.31	2.29	2.28	2.27	2.26	2.26
Silver Ag	mg/L	0.0001104	0.0001101	0.0001097	0.0001118	0.0001091	0.0001091	0.0001087	0.0001079	0.0001073	0.0001069	0.0001066	0.0001063
Sodium Na	mg/L	31	31	31	31	30	30	30	30	30	30	29	29
Strontium Sr	mg/L	0.056	0.056	0.056	0.054	0.052	0.053	0.053	0.053	0.052	0.052	0.052	0.052
Tellurium Te	mg/L	0.038	0.038	0.038	0.040	0.040	0.040	0.041	0.041	0.041	0.040	0.040	0.040
Thallium Tl	mg/L	0.000039	0.000039	0.000039	0.000039	0.000038	0.000039	0.000039	0.000039	0.000039	0.000038	0.000038	0.000038
Thorium Th	mg/L	0.000029	0.000029	0.000029	0.000027	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025
Tin Sn	mg/L	0.00155	0.00154	0.00154	0.00146	0.00138	0.00138	0.00138	0.00137	0.00137	0.00136	0.00136	0.00135
Titanium Ti	mg/L	0.0052	0.0052	0.0052	0.0054	0.0053	0.0054	0.0054	0.0054	0.0054	0.0054	0.0054	0.0053
Uranium U	mg/L	0.000063	0.000063	0.000063	0.000063	0.000061	0.000061	0.000061	0.000061	0.000060	0.000060	0.000060	0.000060
Vanadium V	mg/L	0.0023	0.0023	0.0023	0.0022	0.0021	0.0021	0.0021	0.0021	0.0021	0.0020	0.0020	0.0020
Zinc Zn	mg/L	0.0128	0.0128	0.0127	0.0120	0.0113	0.0114	0.0114	0.0114	0.0113	0.0113	0.0112	0.0112
Zirconium Zr	mg/L	0.0044	0.0044	0.0044	0.0045	0.0045	0.0045	0.0046	0.0046	0.0045	0.0045	0.0045	0.0045

Table H-6-A-2
Scenario 6

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter													
TDS	mg/L	375	374	373	360	344	345	346	344	342	341	340	339
TSS	mg/L	2.9	2.9	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.041	0.041	0.041	0.038	0.036	0.036	0.036	0.036	0.035	0.035	0.035	0.035
Sulphate	mg/L	42.6	42.5	42.3	40.0	37.8	37.8	37.7	37.5	37.3	37.1	37.0	36.9
Chloride	mg/L	249	248	248	236	224	224	224	222	221	220	219	219
Total Ammonia	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nitrate	mg/L	1.94	1.87	1.80	1.70	1.60	1.60	1.59	1.58	1.51	1.44	1.38	1.31
Nitrite	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alkalinity	mg/L	38	38	38	38	37	37	38	37	37	37	37	37
OrthoPhosphate-P	mg/L	0.0895	0.0892	0.0889	0.0838	0.0791	0.0791	0.0788	0.0782	0.0778	0.0775	0.0773	0.0771
Phosphate-P	mg/L	0.0935	0.0932	0.0929	0.0882	0.0833	0.0834	0.0831	0.0825	0.0821	0.0817	0.0815	0.0813
Org. Carbon	mg/L	4.9	4.9	4.9	5.1	5.1	5.1	5.2	5.2	5.2	5.1	5.1	5.1
Hardness CaCO3	mg/L	66	66	66	65	63	63	63	63	63	63	62	62
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0082	0.0082	0.0082	0.0077	0.0073	0.0073	0.0073	0.0072	0.0072	0.0071	0.0071	0.0071
Arsenic As	mg/L	0.0015	0.0015	0.0015	0.0014	0.0014	0.0014	0.0014	0.0013	0.0013	0.0013	0.0013	0.0013
Barium Ba	mg/L	0.0056	0.0056	0.0056	0.0054	0.0052	0.0052	0.0052	0.0052	0.0052	0.0052	0.0051	0.0051
Beryllium Be	mg/L	0.00042	0.00042	0.00041	0.00041	0.00039	0.00039	0.00039	0.00039	0.00038	0.00038	0.00038	0.00038
Bismuth Bi	mg/L	0.00781	0.00779	0.00776	0.00731	0.00689	0.00689	0.00686	0.00681	0.00677	0.00675	0.00673	0.00671
Boron B	mg/L	0.022	0.022	0.022	0.022	0.021	0.021	0.022	0.021	0.021	0.021	0.021	0.021
Cadmium Cd	mg/L	0.0000325	0.0000324	0.0000323	0.0000305	0.0000289	0.0000289	0.0000288	0.0000286	0.0000284	0.0000283	0.0000282	0.0000282
Calcium Ca	mg/L	107	106	106	100	95	95	94	94	93	93	92	92
Chromium Cr	mg/L	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Cobalt Co	mg/L	0.0045	0.0045	0.0045	0.0042	0.0040	0.0040	0.0040	0.0039	0.0039	0.0039	0.0039	0.0039
Copper Cu	mg/L	0.0045	0.0045	0.0045	0.0043	0.0041	0.0041	0.0041	0.0040	0.0040	0.0040	0.0040	0.0040
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00025	0.00025	0.00025	0.00024	0.00023	0.00023	0.00023	0.00023	0.00023	0.00023	0.00023	0.00023
Lithium Li	mg/L	0.0041	0.0041	0.0041	0.0042	0.0040	0.0041	0.0041	0.0041	0.0041	0.0041	0.0041	0.0040
Magnesium Mg	mg/L	6.7	6.7	6.7	6.6	6.4	6.5	6.5	6.5	6.5	6.4	6.4	6.4
Manganese Mn	mg/L	0.013	0.013	0.013	0.012	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011
Mercury Hg	mg/L	0.0000034	0.0000034	0.0000034	0.0000033	0.0000031	0.0000031	0.0000031	0.0000031	0.0000031	0.0000031	0.0000030	0.0000030
Molybdenum Mo	mg/L	0.00379	0.00378	0.00377	0.00355	0.00335	0.00335	0.00334	0.00332	0.00330	0.00329	0.00328	0.00327
Nickel Ni	mg/L	0.0040	0.0040	0.0040	0.0038	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036
Phosphorus P	mg/L	0.138	0.137	0.137	0.130	0.122	0.122	0.122	0.121	0.120	0.120	0.120	0.119
Potassium K	mg/L	18.0	18.0	17.9	17.0	16.1	16.1	16.1	16.0	15.9	15.8	15.8	15.7
Selenium Se	mg/L	0.00045	0.00045	0.00045	0.00045	0.00044	0.00045	0.00045	0.00045	0.00045	0.00044	0.00044	0.00044
Silicon SiO2	mg/L	2.25	2.25	2.24	2.18	2.09	2.10	2.11	2.10	2.09	2.08	2.07	2.07
Silver Ag	mg/L	0.0001061	0.0001057	0.0001054	0.0001076	0.0001053	0.0001053	0.0001050	0.0001042	0.0001037	0.0001033	0.0001029	0.0001027
Sodium Na	mg/L	29	29	29	29	28	28	28	28	28	28	28	28
Strontium Sr	mg/L	0.052	0.052	0.051	0.050	0.048	0.049	0.049	0.049	0.048	0.048	0.048	0.048
Tellurium Te	mg/L	0.040	0.040	0.040	0.042	0.041	0.042	0.043	0.042	0.042	0.042	0.042	0.042
Thallium Tl	mg/L	0.000038	0.000038	0.000038	0.000038	0.000037	0.000038	0.000038	0.000038	0.000038	0.000037	0.000037	0.000037
Thorium Th	mg/L	0.000025	0.000025	0.000024	0.000023	0.000022	0.000022	0.000022	0.000021	0.000021	0.000021	0.000021	0.000021
Tin Sn	mg/L	0.00135	0.00135	0.00134	0.00127	0.00121	0.00121	0.00121	0.00121	0.00120	0.00119	0.00119	0.00119
Titanium Ti	mg/L	0.0053	0.0053	0.0053	0.0055	0.0054	0.0055	0.0056	0.0055	0.0055	0.0055	0.0055	0.0055
Uranium U	mg/L	0.000060	0.000060	0.000059	0.000060	0.000059	0.000059	0.000059	0.000058	0.000058	0.000058	0.000057	0.000057
Vanadium V	mg/L	0.0020	0.0020	0.0020	0.0019	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018
Zinc Zn	mg/L	0.0112	0.0112	0.0111	0.0105	0.0100	0.0100	0.0101	0.0100	0.0100	0.0099	0.0099	0.0099
Zirconium Zr	mg/L	0.0045	0.0045	0.0045	0.0046	0.0046	0.0046	0.0047	0.0047	0.0046	0.0046	0.0046	0.0046

Table H-6-A-2
Scenario 6

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter													
TDS	mg/L	338	337	336	326	312	313	314	312	310	309	308	308
TSS	mg/L	2.9	2.9	2.9	3.0	2.9	2.9	3.0	3.0	2.9	2.9	2.9	2.9
Free CN	mg/L												
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L	0.035	0.035	0.035	0.033	0.031	0.031	0.031	0.031	0.030	0.030	0.030	0.030
Sulphate	mg/L	36.8	36.7	36.6	34.7	32.8	32.8	32.8	32.5	32.4	32.2	32.1	32.1
Chloride	mg/L	218	218	217	207	197	197	197	196	195	194	193	193
Total Ammonia	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nitrate	mg/L	1.25	1.18	1.12	1.05	0.99	0.99	0.99	0.98	0.92	0.85	0.79	0.73
Nitrite	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alkalinity	mg/L	37	37	37	37	36	36	36	36	36	36	36	36
OrthoPhosphate-P	mg/L	0.0769	0.0767	0.0764	0.0722	0.0683	0.0683	0.0681	0.0676	0.0672	0.0670	0.0668	0.0666
Phosphate-P	mg/L	0.0811	0.0809	0.0806	0.0767	0.0726	0.0727	0.0725	0.0719	0.0716	0.0713	0.0711	0.0709
Org. Carbon	mg/L	5.1	5.1	5.1	5.3	5.2	5.3	5.4	5.3	5.3	5.3	5.3	5.3
Hardness CaCO3	mg/L	62	62	62	61	59	59	60	60	59	59	59	59
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Antimony Sb	mg/L	0.0071	0.0071	0.0070	0.0066	0.0063	0.0063	0.0063	0.0062	0.0062	0.0062	0.0062	0.0061
Arsenic As	mg/L	0.0013	0.0013	0.0013	0.0013	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012
Barium Ba	mg/L	0.0051	0.0051	0.0051	0.0049	0.0047	0.0048	0.0048	0.0048	0.0047	0.0047	0.0047	0.0047
Beryllium Be	mg/L	0.00038	0.00038	0.00038	0.00037	0.00036	0.00036	0.00036	0.00036	0.00035	0.00035	0.00035	0.00035
Bismuth Bi	mg/L	0.00670	0.00668	0.00665	0.00627	0.00593	0.00592	0.00590	0.00586	0.00583	0.00581	0.00579	0.00578
Boron B	mg/L	0.021	0.021	0.021	0.021	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020
Cadmium Cd	mg/L	0.0000281	0.0000280	0.0000279	0.0000265	0.0000251	0.0000251	0.0000251	0.0000249	0.0000248	0.0000247	0.0000246	0.0000245
Calcium Ca	mg/L	92	92	92	87	82	82	82	81	81	81	80	80
Chromium Cr	mg/L	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002
Cobalt Co	mg/L	0.0039	0.0039	0.0039	0.0036	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034
Copper Cu	mg/L	0.0040	0.0040	0.0040	0.0038	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00022	0.00022	0.00022	0.00021	0.00020	0.00021	0.00020	0.00020	0.00020	0.00020	0.00020	0.00020
Lithium Li	mg/L	0.0040	0.0040	0.0040	0.0041	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040
Magnesium Mg	mg/L	6.4	6.4	6.3	6.3	6.1	6.2	6.2	6.2	6.2	6.2	6.1	6.1
Manganese Mn	mg/L	0.011	0.011	0.011	0.011	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
Mercury Hg	mg/L	0.0000030	0.0000030	0.0000030	0.0000029	0.0000027	0.0000028	0.0000028	0.0000027	0.0000027	0.0000027	0.0000027	0.0000027
Molybdenum Mo	mg/L	0.00326	0.00325	0.00324	0.00306	0.00290	0.00290	0.00289	0.00287	0.00285	0.00284	0.00283	0.00283
Nickel Ni	mg/L	0.0035	0.0035	0.0035	0.0034	0.0032	0.0032	0.0032	0.0032	0.0032	0.0031	0.0031	0.0031
Phosphorus P	mg/L	0.119	0.119	0.118	0.112	0.106	0.106	0.106	0.105	0.105	0.104	0.104	0.104
Potassium K	mg/L	15.7	15.6	15.6	14.8	14.1	14.1	14.1	14.0	13.9	13.8	13.8	13.8
Selenium Se	mg/L	0.00044	0.00044	0.00044	0.00045	0.00044	0.00044	0.00044	0.00044	0.00044	0.00044	0.00044	0.00044
Silicon SiO2	mg/L	2.06	2.06	2.05	2.01	1.93	1.94	1.95	1.93	1.92	1.92	1.91	1.91
Silver Ag	mg/L	0.0001025	0.0001022	0.0001018	0.0001042	0.0001022	0.0001021	0.0001019	0.0001011	0.0001006	0.0001002	0.0000999	0.0000997
Sodium Na	mg/L	28	28	27	27	26	27	27	27	27	26	26	26
Strontium Sr	mg/L	0.048	0.048	0.048	0.047	0.045	0.045	0.046	0.045	0.045	0.045	0.045	0.045
Tellurium Te	mg/L	0.042	0.042	0.041	0.043	0.043	0.043	0.044	0.044	0.044	0.043	0.043	0.043
Thallium Tl	mg/L	0.000037	0.000037	0.000037	0.000037	0.000036	0.000037	0.000037	0.000037	0.000037	0.000036	0.000036	0.000036
Thorium Th	mg/L	0.000021	0.000021	0.000021	0.000020	0.000019	0.000019	0.000019	0.000018	0.000018	0.000018	0.000018	0.000018
Tin Sn	mg/L	0.00119	0.00118	0.00118	0.00112	0.00107	0.00107	0.00107	0.00106	0.00106	0.00106	0.00105	0.00105
Titanium Ti	mg/L	0.0054	0.0054	0.0054	0.0056	0.0055	0.0056	0.0057	0.0056	0.0056	0.0056	0.0056	0.0056
Uranium U	mg/L	0.000057	0.000057	0.000057	0.000058	0.000056	0.000056	0.000056	0.000056	0.000056	0.000055	0.000055	0.000055
Vanadium V	mg/L	0.0018	0.0018	0.0018	0.0017	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016
Zinc Zn	mg/L	0.0099	0.0098	0.0098	0.0093	0.0088	0.0088	0.0089	0.0089	0.0089	0.0088	0.0088	0.0088
Zirconium Zr	mg/L	0.0046	0.0046	0.0046	0.0047	0.0046	0.0047	0.0047	0.0047	0.0047	0.0047	0.0047	0.0047

Table H-6-A-2
Scenario 6

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE										
Date		Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16
Parameter												
TDS	mg/L	307	306	305	388	461	553	645	732	729	726	724
TSS	mg/L	2.9	2.9	2.9	3.1	3.1	3.2	3.2	3.2	3.2	3.2	3.2
Free CN	mg/L											
Total CN	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WAD CN	mg/L											
CNO	mg/L											
SCN	mg/L	0.030	0.030	0.030	0.028	0.027	0.027	0.027	0.026	0.026	0.026	0.026
Sulphate	mg/L	32.0	31.9	31.8	30.2	28.6	28.7	28.6	28.4	28.3	28.2	28.1
Chloride	mg/L	193	192	191	243	287	344	400	453	451	449	448
Total Ammonia	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nitrate	mg/L	0.66	0.60	0.54	0.51	0.48	0.48	0.48	0.48	0.41	0.35	0.29
Nitrite	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Alkalinity	mg/L	36	35	35	35	35	35	35	35	35	35	35
OrthoPhosphate-P	mg/L	0.0665	0.0663	0.0661	0.0625	0.0592	0.0592	0.0590	0.0586	0.0583	0.0581	0.0579
Phosphate-P	mg/L	0.0708	0.0706	0.0703	0.0681	0.0650	0.0652	0.0652	0.0648	0.0645	0.0642	0.0640
Org. Carbon	mg/L	5.3	5.2	5.2	5.4	5.4	5.4	5.5	5.5	5.5	5.4	5.4
Hardness CaCO3	mg/L	59	58	58	58	56	56	57	57	56	56	56
Total Metals												
Aluminum Al	mg/L	0.03	0.03	0.03	0.05	0.05	0.05	0.05	0.06	0.05	0.05	0.05
Antimony Sb	mg/L	0.0061	0.0061	0.0061	0.0058	0.0055	0.0055	0.0055	0.0054	0.0054	0.0054	0.0054
Arsenic As	mg/L	0.0012	0.0012	0.0012	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011
Barium Ba	mg/L	0.0047	0.0047	0.0046	0.0045	0.0043	0.0044	0.0044	0.0044	0.0043	0.0043	0.0043
Beryllium Be	mg/L	0.00035	0.00035	0.00035	0.00034	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
Bismuth Bi	mg/L	0.00576	0.00575	0.00573	0.00541	0.00512	0.00512	0.00510	0.00507	0.00504	0.00502	0.00501
Boron B	mg/L	0.020	0.020	0.020	0.021	0.021	0.022	0.022	0.022	0.022	0.022	0.022
Cadmium Cd	mg/L	0.0000245	0.0000244	0.0000243	0.0000236	0.0000227	0.0000228	0.0000228	0.0000228	0.0000226	0.0000225	0.0000224
Calcium Ca	mg/L	80	80	80	81	82	88	93	98	97	97	96
Chromium Cr	mg/L	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Cobalt Co	mg/L	0.0033	0.0033	0.0033	0.0032	0.0030	0.0030	0.0030	0.0030	0.0030	0.0029	0.0029
Copper Cu	mg/L	0.0035	0.0035	0.0035	0.0034	0.0033	0.0033	0.0033	0.0033	0.0033	0.0033	0.0033
Iron Fe	mg/L	0.05	0.05	0.05	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Lead Pb	mg/L	0.00020	0.00020	0.00020	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00018	0.00018
Lithium Li	mg/L	0.0040	0.0039	0.0039	0.0041	0.0041	0.0041	0.0042	0.0042	0.0041	0.0041	0.0041
Magnesium Mg	mg/L	6.1	6.1	6.1	6.2	6.1	6.2	6.3	6.3	6.3	6.2	6.2
Manganese Mn	mg/L	0.010	0.010	0.010	0.010	0.009	0.009	0.009	0.009	0.009	0.009	0.009
Mercury Hg	mg/L	0.0000027	0.0000027	0.0000027	0.0000036	0.0000039	0.0000041	0.0000043	0.0000043	0.0000043	0.0000042	0.0000042
Molybdenum Mo	mg/L	0.00282	0.00281	0.00280	0.00267	0.00254	0.00254	0.00254	0.00252	0.00251	0.00250	0.00249
Nickel Ni	mg/L	0.0031	0.0031	0.0031	0.0030	0.0028	0.0029	0.0029	0.0028	0.0028	0.0028	0.0028
Phosphorus P	mg/L	0.103	0.103	0.103	0.098	0.093	0.093	0.092	0.092	0.091	0.091	0.091
Potassium K	mg/L	13.7	13.7	13.6	13.1	12.6	12.6	12.6	12.5	12.5	12.4	12.4
Selenium Se	mg/L	0.00043	0.00043	0.00043	0.00049	0.00050	0.00052	0.00053	0.00053	0.00053	0.00052	0.00052
Silicon SiO2	mg/L	1.90	1.90	1.89	1.89	1.83	1.85	1.86	1.85	1.84	1.84	1.83
Silver Ag	mg/L	0.0000995	0.0000992	0.0000989	0.0001019	0.0001002	0.0001003	0.0001001	0.0000995	0.0000990	0.0000986	0.0000983
Sodium Na	mg/L	26	26	26	59	87	118	148	178	177	176	176
Strontium Sr	mg/L	0.045	0.044	0.044	0.044	0.043	0.044	0.044	0.044	0.044	0.044	0.044
Tellurium Te	mg/L	0.043	0.043	0.043	0.044	0.044	0.044	0.045	0.045	0.045	0.044	0.044
Thallium Tl	mg/L	0.000036	0.000036	0.000036	0.000036	0.000036	0.000036	0.000036	0.000036	0.000036	0.000036	0.000036
Thorium Th	mg/L	0.000018	0.000018	0.000018	0.000021	0.000021	0.000022	0.000023	0.000023	0.000022	0.000022	0.000022
Tin Sn	mg/L	0.00105	0.00104	0.00104	0.00099	0.00095	0.00095	0.00096	0.00095	0.00095	0.00094	0.00094
Titanium Ti	mg/L	0.0055	0.0055	0.0055	0.0064	0.0066	0.0068	0.0070	0.0070	0.0070	0.0069	0.0069
Uranium U	mg/L	0.000055	0.000055	0.000055	0.000058	0.000058	0.000058	0.000059	0.000058	0.000058	0.000058	0.000058
Vanadium V	mg/L	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0017	0.0017	0.0016	0.0016	0.0016
Zinc Zn	mg/L	0.0088	0.0087	0.0087	0.0084	0.0080	0.0080	0.0081	0.0081	0.0080	0.0080	0.0080
Zirconium Zr	mg/L	0.0047	0.0046	0.0046	0.0048	0.0047	0.0048	0.0048	0.0048	0.0048	0.0048	0.0047

Table H 6-A-3
Scenario 6

Loadings to Tail Lake (kg/month)												
Date	Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter												
TDS	81148	78530	81148	117442	101029	86301	86266	83184	78530	81148	81148	73295
TSS	183	177	183	1239	680	338	371	234	177	183	183	166
Free CN	1.10	1.06	1.10	1.06	1.10	1.10	1.06	1.10	1.06	1.10	1.10	0.99
Total CN	11	10	11	11	11	11	10	11	10	11	11	10
WAD CN	1.47	1.42	1.47	1.42	1.47	1.47	1.42	1.47	1.42	1.47	1.47	1.32
CNO	1210	1171	1210	1171	1210	1210	1171	1210	1171	1210	1210	1093
SCN	16	16	16	16	16	16	16	16	16	16	16	15
Sulphate	14302	13840	14302	18322	17070	15396	15294	14793	13840	14302	14302	12918
Chloride	49110	47526	49110	82360	70979	57284	58132	52607	47526	49110	49110	44357
Total Ammonia	149	145	149	288	238	187	194	166	145	149	149	135
Nitrate	758	733	758	1855	1453	1051	1108	888	733	758	758	684
Nitrite	116	112	116	139	132	123	121	119	112	116	116	105
Alkalinity	6928	6704	6928	15548	12064	8319	8316	7352	6704	6928	6928	6257
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	24	22	22	21	21	21	21	21	19
Org. Carbon				2122.46	1159.76	309.17	322.34	84.86				
Hardness CaCO3	14992	14508	14992	26182	22116	16898	16958	15637	14508	14992	14992	13541
Total Metals												
Aluminum Al	4.47	4.33	4.47	19.31	12.06	9.22	8.81	5.91	4.33	4.47	4.47	4.04
Antimony Sb	1.32	1.28	1.32	4.67	3.44	2.22	2.44	1.72	1.28	1.32	1.32	1.19
Arsenic As	0.39	0.38	0.39	0.69	0.59	0.47	0.47	0.43	0.38	0.39	0.39	0.36
Barium Ba	1.56	1.51	1.56	2.29	2.00	1.75	1.72	1.62	1.51	1.56	1.56	1.41
Beryllium Be	0.05	0.05	0.05	0.23	0.15	0.08	0.09	0.06	0.05	0.05	0.05	0.04
Bismuth Bi	1.23	1.19	1.23	4.55	3.31	2.10	2.31	1.62	1.19	1.23	1.23	1.11
Boron B	2.80	2.71	2.80	10.30	7.36	4.49	4.72	3.43	2.71	2.80	2.80	2.53
Cadmium Cd	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Calcium Ca	40484	39178	40484	42156	42159	41153	39986	40730	39178	40484	40484	36566
Chromium Cr	1.02	0.99	1.02	1.32	1.26	1.11	1.06	1.04	0.99	1.02	1.02	0.92
Cobalt Co	1.67	1.62	1.67	1.85	1.81	1.73	1.69	1.70	1.62	1.67	1.67	1.51
Copper Cu	1.46	1.41	1.46	1.84	1.69	1.52	1.49	1.48	1.41	1.46	1.46	1.32
Iron Fe	4.63	4.48	4.63	21.53	11.62	9.25	9.35	5.98	4.48	4.63	4.63	4.18
Lead Pb	0.05	0.05	0.05	0.13	0.10	0.07	0.07	0.06	0.05	0.05	0.05	0.04
Lithium Li	0.46	0.45	0.46	1.84	1.15	0.69	0.73	0.54	0.45	0.46	0.46	0.42
Magnesium Mg	1082	1047	1082	2866	2080	1457	1462	1202	1047	1082	1082	977
Manganese Mn	4.56	4.41	4.56	5.17	4.97	4.80	4.75	4.66	4.41	4.56	4.56	4.12
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	1.48	1.43	1.48	1.50	1.52	1.49	1.45	1.48	1.43	1.48	1.48	1.34
Nickel Ni	1.26	1.22	1.26	1.77	1.58	1.38	1.37	1.31	1.22	1.26	1.26	1.14
Phosphorus P	33	32	33	45	40	36	36	35	32	33	33	30
Potassium K	6696	6480	6696	7119	7033	6793	6628	6738	6480	6696	6696	6048
Selenium Se	0.04	0.04	0.04	0.21	0.12	0.06	0.07	0.05	0.04	0.04	0.04	0.03
Silicon SiO2	556	538	556	963	771	630	632	584	538	556	556	502
Silver Ag	0.01	0.01	0.01	0.06	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sodium Na	6353	6148	6353	11746	9495	7297	7336	6667	6148	6353	6353	5739
Strontium Sr	12	12	12	21	18	14	14	13	12	12	12	11
Tellurium Te	0.02	0.02	0.02	17.74	8.32	2.60	3.25	0.87	0.02	0.02	0.02	0.02
Thallium Tl	0.00	0.00	0.00	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.02	0.01	0.00	0.01	0.00				
Tin Sn	0.18	0.18	0.18	0.74	0.56	0.34	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.10	0.09	0.10	2.42	1.21	0.46	0.55	0.22	0.09	0.10	0.10	0.09
Uranium U	0.00	0.00	0.00	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.36	0.35	0.36	1.09	0.79	0.52	0.54	0.43	0.35	0.36	0.36	0.33
Zinc Zn	3.5	3.4	3.5	4.4	4.1	3.8	4.2	3.7	3.4	3.5	3.5	3.2
Zirconium Zr				2.10	1.03	0.34	0.43	0.12				

Table H 6-A-3
Scenario 6

Loadings to Tail Lake (kg/month)												
Date	Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter												
TDS	81148	78530	81148	116283	100486	86161	86057	83130	78530	81148	81148	73295
TSS	183	177	183	1207	667	334	366	233	177	183	183	166
Free CN	1.10	1.06	1.10	1.06	1.10	1.10	1.06	1.10	1.06	1.10	1.10	0.99
Total CN	11	10	11	11	11	11	10	11	10	11	11	10
WAD CN	1.47	1.42	1.47	1.42	1.47	1.47	1.42	1.47	1.42	1.47	1.47	1.32
CNO	1210	1171	1210	1171	1210	1210	1171	1210	1171	1210	1210	1093
SCN	16	16	16	16	16	16	16	16	16	16	16	15
Sulphate	14302	13840	14302	18301	17058	15393	15289	14791	13840	14302	14302	12918
Chloride	49110	47526	49110	82054	70798	57237	58067	52590	47526	49110	49110	44357
Total Ammonia	149	145	149	288	238	187	194	166	145	149	149	135
Nitrate	758	733	758	1855	1453	1051	1108	888	733	758	758	684
Nitrite	116	112	116	139	132	123	121	119	112	116	116	105
Alkalinity	6928	6704	6928	15284	11923	8281	8272	7341	6704	6928	6928	6257
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	24	22	22	21	21	21	21	21	19
Org. Carbon				2059.25	1128.06	300.82	313.61	82.60				
Hardness CaCO3	14992	14508	14992	25834	21921	16847	16892	15620	14508	14992	14992	13541
Total Metals												
Aluminum Al	4.47	4.33	4.47	19.13	12.01	9.15	8.77	5.90	4.33	4.47	4.47	4.04
Antimony Sb	1.32	1.28	1.32	4.67	3.44	2.22	2.44	1.72	1.28	1.32	1.32	1.19
Arsenic As	0.39	0.38	0.39	0.69	0.59	0.47	0.47	0.43	0.38	0.39	0.39	0.36
Barium Ba	1.56	1.51	1.56	2.27	1.99	1.75	1.72	1.62	1.51	1.56	1.56	1.41
Beryllium Be	0.05	0.05	0.05	0.23	0.15	0.08	0.09	0.06	0.05	0.05	0.05	0.04
Bismuth Bi	1.23	1.19	1.23	4.55	3.31	2.10	2.31	1.62	1.19	1.23	1.23	1.11
Boron B	2.80	2.71	2.80	10.18	7.30	4.47	4.69	3.42	2.71	2.80	2.80	2.53
Cadmium Cd	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Calcium Ca	40484	39178	40484	42102	42133	41143	39975	40727	39178	40484	40484	36566
Chromium Cr	1.02	0.99	1.02	1.31	1.26	1.11	1.06	1.04	0.99	1.02	1.02	0.92
Cobalt Co	1.67	1.62	1.67	1.85	1.81	1.73	1.69	1.70	1.62	1.67	1.67	1.51
Copper Cu	1.46	1.41	1.46	1.83	1.69	1.52	1.49	1.48	1.41	1.46	1.46	1.32
Iron Fe	4.63	4.48	4.63	21.08	11.47	9.14	9.24	5.95	4.48	4.63	4.63	4.18
Lead Pb	0.05	0.05	0.05	0.13	0.10	0.07	0.07	0.06	0.05	0.05	0.05	0.04
Lithium Li	0.46	0.45	0.46	1.80	1.13	0.68	0.73	0.54	0.45	0.46	0.46	0.42
Magnesium Mg	1082	1047	1082	2823	2059	1449	1454	1200	1047	1082	1082	977
Manganese Mn	4.56	4.41	4.56	5.16	4.97	4.80	4.74	4.66	4.41	4.56	4.56	4.12
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	1.48	1.43	1.48	1.50	1.52	1.49	1.45	1.48	1.43	1.48	1.48	1.34
Nickel Ni	1.26	1.22	1.26	1.76	1.57	1.38	1.37	1.31	1.22	1.26	1.26	1.14
Phosphorus P	33	32	33	45	40	36	36	35	32	33	33	30
Potassium K	6696	6480	6696	7103	7025	6791	6624	6737	6480	6696	6696	6048
Selenium Se	0.04	0.04	0.04	0.21	0.12	0.06	0.07	0.05	0.04	0.04	0.04	0.03
Silicon SiO2	556	538	556	954	767	629	630	583	538	556	556	502
Silver Ag	0.01	0.01	0.01	0.06	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sodium Na	6353	6148	6353	11580	9410	7272	7305	6659	6148	6353	6353	5739
Strontium Sr	12	12	12	21	17	14	14	13	12	12	12	11
Tellurium Te	0.02	0.02	0.02	17.21	8.10	2.53	3.16	0.85	0.02	0.02	0.02	0.02
Thallium Tl	0.00	0.00	0.00	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.02	0.01	0.00	0.01	0.00				
Tin Sn	0.18	0.18	0.18	0.74	0.56	0.34	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.10	0.09	0.10	2.35	1.19	0.45	0.54	0.22	0.09	0.10	0.10	0.09
Uranium U	0.00	0.00	0.00	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.36	0.35	0.36	1.08	0.79	0.52	0.54	0.43	0.35	0.36	0.36	0.33
Zinc Zn	3.5	3.4	3.5	4.4	4.1	3.8	4.2	3.7	3.4	3.5	3.5	3.2
Zirconium Zr				2.05	1.01	0.34	0.42	0.12				

Table H 6-A-3
Scenario 6

Loadings to Tail Lake (kg/month)												
Date	Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter												
TDS	50662	49028	50662	86147	69704	55601	56446	52617	49028	50662	50662	45759
TSS				1012	476	148	185	49				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate	1289	1247	1289	5596	3977	2353	2660	1766	1247	1289	1289	1164
Chloride	49110	47526	49110	81887	70699	57212	58033	52581	47526	49110	49110	44357
Total Ammonia	25	24	25	153	104	58	68	40	24	25	25	22
Nitrate	29	28	29	1036	654	292	365	147	28	29	29	26
Nitrite	64	62	64	86	79	71	70	67	62	64	64	58
Alkalinity				8436	4919	1334	1545	407				
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	24	22	22	21	21	21	21	21	19
Org. Carbon				2024.67	1110.80	296.36	309.08	81.46				
Hardness CaCO3				11136	6823	1828	2349	619				
Total Metals												
Aluminum Al	0.81	0.78	0.81	12.54	6.49	4.68	4.22	1.89	0.78	0.81	0.81	0.73
Antimony Sb	1.21	1.17	1.21	4.55	3.32	2.11	2.33	1.61	1.17	1.21	1.21	1.09
Arsenic As	0.03	0.03	0.03	0.27	0.18	0.08	0.10	0.05	0.03	0.03	0.03	0.02
Barium Ba	0.06	0.06	0.06	0.80	0.48	0.24	0.26	0.12	0.06	0.06	0.06	0.05
Beryllium Be	0.03	0.03	0.03	0.20	0.13	0.06	0.06	0.04	0.03	0.03	0.03	0.03
Bismuth Bi	1.21	1.17	1.21	4.52	3.28	2.08	2.29	1.60	1.17	1.21	1.21	1.09
Boron B	0.60	0.58	0.60	7.29	4.63	2.08	2.32	1.14	0.58	0.60	0.60	0.55
Cadmium Cd	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Calcium Ca	263	254	263	2975	1790	871	987	484	254	263	263	237
Chromium Cr	0.07	0.06	0.07	0.37	0.30	0.16	0.13	0.09	0.06	0.07	0.07	0.06
Cobalt Co	0.06	0.06	0.06	0.28	0.19	0.11	0.13	0.08	0.06	0.06	0.06	0.05
Copper Cu	0.03	0.03	0.03	0.42	0.24	0.09	0.10	0.05	0.03	0.03	0.03	0.03
Iron Fe	0.23	0.23	0.23	15.90	6.56	4.51	4.69	1.45	0.23	0.23	0.23	0.21
Lead Pb	0.01	0.01	0.01	0.08	0.05	0.03	0.03	0.02	0.01	0.01	0.01	0.01
Lithium Li	0.06	0.06	0.06	1.38	0.71	0.28	0.33	0.14	0.06	0.06	0.06	0.05
Magnesium Mg	121	117	121	1853	1077	480	515	236	117	121	121	110
Manganese Mn	0.16	0.15	0.16	0.89	0.56	0.39	0.48	0.26	0.15	0.16	0.16	0.14
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	0.01	0.01	0.01	0.08	0.05	0.02	0.03	0.02	0.01	0.01	0.01	0.01
Nickel Ni	0.12	0.12	0.12	0.65	0.43	0.24	0.26	0.17	0.12	0.12	0.12	0.11
Phosphorus P	23	22	23	33	29	25	25	24	22	23	23	21
Potassium K	25	24	25	633	347	117	165	65	24	25	25	23
Selenium Se	0.00	0.00	0.00	0.16	0.08	0.02	0.03	0.01	0.00	0.00	0.00	0.00
Silicon SiO2	10	9	10	387	199	74	90	33	9	10	10	9
Silver Ag	0.00	0.00	0.00	0.05	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Sodium Na	12	12	12	5349	3020	916	1150	313	12	12	12	11
Strontium Sr	0	0	0	9	5	2	2	1	0	0	0	0
Tellurium Te				16.89	7.95	2.47	3.10	0.82				
Thallium Tl	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn	0.18	0.18	0.18	0.73	0.55	0.33	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.06	0.06	0.06	2.27	1.13	0.41	0.49	0.18	0.06	0.06	0.06	0.05
Uranium U	0.00	0.00	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.18	0.18	0.18	0.87	0.59	0.33	0.36	0.24	0.18	0.18	0.18	0.16
Zinc Zn	0.2	0.2	0.2	1.1	0.8	0.5	0.9	0.4	0.2	0.2	0.2	0.2
Zirconium Zr				1.88	0.92	0.30	0.38	0.10				

Table H 6-A-3
Scenario 6

Loadings to Tail Lake (kg/month)												
Date	Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter												
TDS				36933	18956	4918	7387	1947				
TSS				1007	474	148	185	49				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				808	492	139	228	64				
Chloride				9737	6319	1672	2278	600				
Total Ammonia				61	37	16	21	7				
Nitrate				470	291	122	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				8394	4897	1328	1539	406				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				2014.52	1105.74	295.08	307.80	81.14				
Hardness CaCO3				11080	6792	1820	2339	617				
Total Metals												
Aluminum Al				9.83	4.49	3.37	2.79	0.86				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.17	0.11	0.04	0.05	0.01				
Barium Ba				0.57	0.31	0.14	0.15	0.04				
Beryllium Be				0.09	0.04	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				5.03	2.99	1.04	1.18	0.34				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				1991	1075	418	490	136				
Chromium Cr				0.14	0.13	0.05	0.01	0.00				
Cobalt Co				0.05	0.03	0.01	0.01	0.00				
Copper Cu				0.33	0.17	0.04	0.05	0.01				
Iron Fe				15.10	5.99	4.13	4.28	1.16				
Lead Pb				0.04	0.02	0.01	0.01	0.00				
Lithium Li				1.15	0.54	0.17	0.21	0.06				
Magnesium Mg				1395	745	271	285	76				
Manganese Mn				0.29	0.12	0.12	0.18	0.05				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.20	0.10	0.03	0.03	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				537	277	73	117	31				
Selenium Se				0.15	0.08	0.02	0.03	0.01				
Silicon SiO2				350	172	57	71	20				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				5278	2974	892	1122	296				
Strontium Sr				7	4	1	2	0				
Tellurium Te				16.81	7.91	2.46	3.08	0.81				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.05	0.06	0.02	0.03	0.01				
Titanium Ti				2.03	0.96	0.30	0.38	0.10				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.20	0.10	0.02	0.01	0.00				
Zinc Zn				0.4	0.2	0.1	0.5	0.1				
Zirconium Zr				1.88	0.91	0.30	0.37	0.10				

Table H 6-A-3
Scenario 6

Loadings to Tail Lake (kg/month)												
Date	Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter												
TDS				36836	18908	4905	7368	1942				
TSS				1005	473	147	184	49				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				807	491	139	228	64				
Chloride				9711	6303	1668	2272	599				
Total Ammonia				61	37	16	21	7				
Nitrate				470	291	122	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				8372	4885	1324	1535	405				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				2009.22	1102.96	294.33	307.01	80.93				
Hardness CaCO3				11051	6775	1815	2333	615				
Total Metals												
Aluminum Al				9.81	4.49	3.36	2.79	0.86				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.17	0.11	0.04	0.05	0.01				
Barium Ba				0.57	0.31	0.14	0.15	0.04				
Beryllium Be				0.09	0.04	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				5.02	2.98	1.04	1.18	0.34				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				1986	1073	417	489	136				
Chromium Cr				0.14	0.13	0.05	0.01	0.00				
Cobalt Co				0.05	0.03	0.01	0.01	0.00				
Copper Cu				0.33	0.17	0.04	0.05	0.01				
Iron Fe				15.06	5.98	4.12	4.27	1.15				
Lead Pb				0.04	0.02	0.01	0.01	0.00				
Lithium Li				1.15	0.54	0.17	0.21	0.06				
Magnesium Mg				1392	744	270	284	76				
Manganese Mn				0.29	0.12	0.12	0.18	0.05				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.20	0.10	0.03	0.03	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				535	277	73	117	31				
Selenium Se				0.15	0.08	0.02	0.03	0.01				
Silicon SiO2				349	171	57	71	20				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				5264	2966	890	1120	295				
Strontium Sr				7	4	1	2	0				
Tellurium Te				16.76	7.89	2.46	3.08	0.81				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.05	0.06	0.02	0.03	0.01				
Titanium Ti				2.03	0.96	0.30	0.38	0.10				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.20	0.10	0.02	0.01	0.00				
Zinc Zn				0.4	0.2	0.1	0.5	0.1				
Zirconium Zr				1.87	0.91	0.30	0.37	0.10				

Table H 6-A-3
Scenario 6

Loadings to Tail Lake (kg/month)												
Date	Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter												
TDS				36744	18862	4894	7350	1938				
TSS				1002	472	147	184	48				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				805	490	139	227	64				
Chloride				9687	6287	1664	2266	597				
Total Ammonia				61	37	16	21	7				
Nitrate				470	291	122	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				8351	4873	1321	1531	404				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				2004.20	1100.31	293.62	306.26	80.73				
Hardness CaCO3				11023	6759	1811	2328	614				
Total Metals												
Aluminum Al				9.80	4.48	3.36	2.79	0.86				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.17	0.11	0.04	0.05	0.01				
Barium Ba				0.57	0.31	0.14	0.15	0.04				
Beryllium Be				0.09	0.04	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				5.01	2.98	1.03	1.17	0.34				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				1982	1071	417	488	136				
Chromium Cr				0.14	0.13	0.05	0.01	0.00				
Cobalt Co				0.05	0.03	0.01	0.01	0.00				
Copper Cu				0.33	0.17	0.04	0.05	0.01				
Iron Fe				15.03	5.96	4.11	4.26	1.15				
Lead Pb				0.04	0.02	0.01	0.01	0.00				
Lithium Li				1.15	0.54	0.17	0.21	0.06				
Magnesium Mg				1388	742	269	283	75				
Manganese Mn				0.29	0.12	0.12	0.18	0.05				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.20	0.10	0.03	0.03	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				534	276	73	117	31				
Selenium Se				0.15	0.08	0.02	0.03	0.01				
Silicon SiO2				348	171	56	71	20				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				5250	2959	887	1117	295				
Strontium Sr				7	4	1	2	0				
Tellurium Te				16.72	7.87	2.45	3.07	0.81				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.05	0.06	0.02	0.02	0.01				
Titanium Ti				2.02	0.96	0.30	0.37	0.10				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.20	0.10	0.02	0.01	0.00				
Zinc Zn				0.4	0.2	0.1	0.5	0.1				
Zirconium Zr				1.87	0.91	0.30	0.37	0.10				

Table H 6-A-3
Scenario 6

Loadings to Tail Lake (kg/month)												
Date	Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter												
TDS				36656	18819	4882	7333	1933				
TSS				1000	470	146	183	48				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				656	398	100	178	47				
Chloride				9664	6273	1660	2261	596				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				8331	4862	1318	1528	403				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1999.43	1097.79	292.94	305.54	80.54				
Hardness CaCO3				10997	6744	1806	2322	612				
Total Metals												
Aluminum Al				5.50	1.82	2.23	1.35	0.36				
Antimony Sb				0.04	0.04	0.03	0.04	0.01				
Arsenic As				0.07	0.04	0.01	0.01	0.00				
Barium Ba				0.55	0.30	0.13	0.14	0.04				
Beryllium Be				0.07	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.00	0.00	0.00	0.00				
Boron B				4.00	2.35	0.77	0.84	0.22				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				1726	913	350	403	106				
Chromium Cr				0.12	0.12	0.04	0.01	0.00				
Cobalt Co				0.03	0.02	0.00	0.01	0.00				
Copper Cu				0.30	0.16	0.04	0.04	0.01				
Iron Fe				14.00	5.33	3.84	3.92	1.03				
Lead Pb				0.02	0.01	0.00	0.00	0.00				
Lithium Li				1.12	0.53	0.16	0.21	0.05				
Magnesium Mg				1360	725	262	274	72				
Manganese Mn				0.27	0.11	0.11	0.17	0.04				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.17	0.08	0.02	0.02	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				527	271	71	114	30				
Selenium Se				0.13	0.06	0.02	0.02	0.01				
Silicon SiO2				300	141	44	55	14				
Silver Ag				0.03	0.02	0.00	0.00	0.00				
Sodium Na				5232	2948	884	1112	293				
Strontium Sr				7	4	1	2	0				
Tellurium Te				16.66	7.84	2.44	3.06	0.81				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th												
Tin Sn				0.03	0.05	0.01	0.02	0.00				
Titanium Ti				2.00	0.94	0.29	0.37	0.10				
Uranium U				0.02	0.01	0.00	0.00	0.00				
Vanadium V				0.16	0.07	0.01	0.00	0.00				
Zinc Zn				0.3	0.1	0.1	0.5	0.1				
Zirconium Zr				1.67	0.78	0.24	0.31	0.08				

Table H 6-A-3
Scenario 6

Loadings to Tail Lake (kg/month)												
Date	Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter												
TDS				36573	18778	4872	7317	1929				
TSS				997	469	146	183	48				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				655	397	100	177	47				
Chloride				9642	6259	1656	2256	595				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				8312	4851	1315	1524	402				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1994.87	1095.38	292.29	304.86	80.36				
Hardness CaCO3				10972	6729	1802	2317	611				
Total Metals												
Aluminum Al				5.49	1.82	2.23	1.35	0.36				
Antimony Sb				0.04	0.04	0.03	0.04	0.01				
Arsenic As				0.07	0.04	0.01	0.01	0.00				
Barium Ba				0.55	0.30	0.13	0.14	0.04				
Beryllium Be				0.07	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.00	0.00	0.00	0.00				
Boron B				3.99	2.35	0.77	0.84	0.22				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				1722	911	349	402	106				
Chromium Cr				0.12	0.12	0.04	0.01	0.00				
Cobalt Co				0.03	0.02	0.00	0.01	0.00				
Copper Cu				0.30	0.16	0.04	0.04	0.01				
Iron Fe				13.96	5.32	3.83	3.91	1.03				
Lead Pb				0.02	0.01	0.00	0.00	0.00				
Lithium Li				1.12	0.53	0.16	0.21	0.05				
Magnesium Mg				1357	723	262	274	72				
Manganese Mn				0.27	0.11	0.11	0.17	0.04				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.17	0.08	0.02	0.02	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				525	271	71	114	30				
Selenium Se				0.13	0.06	0.02	0.02	0.01				
Silicon SiO2				299	141	44	55	14				
Silver Ag				0.03	0.02	0.00	0.00	0.00				
Sodium Na				5220	2942	882	1110	293				
Strontium Sr				7	4	1	2	0				
Tellurium Te				16.62	7.82	2.44	3.05	0.80				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th												
Tin Sn				0.03	0.05	0.01	0.02	0.00				
Titanium Ti				1.99	0.94	0.29	0.37	0.10				
Uranium U				0.02	0.01	0.00	0.00	0.00				
Vanadium V				0.16	0.07	0.01	0.00	0.00				
Zinc Zn				0.3	0.1	0.1	0.5	0.1				
Zirconium Zr				1.66	0.78	0.24	0.30	0.08				

Table H 6-A-3
Scenario 6

Loadings to Tail Lake (kg/month)												
Date	Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter												
TDS				36493	18738	4861	7301	1925				
TSS				995	468	146	183	48				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				654	397	100	177	47				
Chloride				9621	6246	1653	2251	593				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				8294	4841	1313	1521	401				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1990.52	1093.07	291.67	304.21	80.19				
Hardness CaCO3				10948	6715	1799	2312	609				
Total Metals												
Aluminum Al				5.47	1.81	2.22	1.34	0.35				
Antimony Sb				0.04	0.04	0.03	0.04	0.01				
Arsenic As				0.07	0.04	0.01	0.01	0.00				
Barium Ba				0.55	0.30	0.13	0.14	0.04				
Beryllium Be				0.07	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.00	0.00	0.00	0.00				
Boron B				3.98	2.34	0.77	0.83	0.22				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				1718	909	349	401	106				
Chromium Cr				0.12	0.12	0.04	0.01	0.00				
Cobalt Co				0.03	0.02	0.00	0.01	0.00				
Copper Cu				0.30	0.16	0.04	0.04	0.01				
Iron Fe				13.93	5.31	3.82	3.90	1.03				
Lead Pb				0.02	0.01	0.00	0.00	0.00				
Lithium Li				1.12	0.53	0.16	0.21	0.05				
Magnesium Mg				1354	721	261	273	72				
Manganese Mn				0.27	0.11	0.11	0.17	0.04				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.17	0.08	0.02	0.02	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				524	270	71	114	30				
Selenium Se				0.13	0.06	0.02	0.02	0.01				
Silicon SiO2				299	141	44	55	14				
Silver Ag				0.03	0.02	0.00	0.00	0.00				
Sodium Na				5209	2936	880	1107	292				
Strontium Sr				7	4	1	2	0				
Tellurium Te				16.59	7.81	2.43	3.04	0.80				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th												
Tin Sn				0.03	0.05	0.01	0.02	0.00				
Titanium Ti				1.99	0.94	0.29	0.37	0.10				
Uranium U				0.02	0.01	0.00	0.00	0.00				
Vanadium V				0.16	0.07	0.01	0.00	0.00				
Zinc Zn				0.3	0.1	0.1	0.5	0.1				
Zirconium Zr				1.66	0.78	0.24	0.30	0.08				

Table H 6-A-3
Scenario 6

Loadings to Tail Lake (kg/month)												
Date	Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16	Year 10 Jan-17
Parameter												
TDS				414629	396913	383064	385498	380133				
TSS				1610	758	236	295	78				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				652	396	99	177	47				
Chloride				256711	244496	234492	235705	231793				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				8276	4831	1310	1518	400				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				7	3	1	1	0				
Org. Carbon				1986.35	1090.85	291.08	303.58	80.03				
Hardness CaCO3				10925	6701	1795	2307	608				
Total Metals												
Aluminum Al				58.94	26.98	10.05	11.15	2.94				
Antimony Sb				0.06	0.05	0.03	0.04	0.01				
Arsenic As				0.15	0.09	0.02	0.03	0.01				
Barium Ba				0.55	0.30	0.13	0.14	0.04				
Beryllium Be				0.07	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.01	0.00	0.00	0.00				
Boron B				10.64	5.48	1.74	2.06	0.54				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				24497	23421	22697	22768	22405				
Chromium Cr				0.23	0.17	0.06	0.03	0.01				
Cobalt Co				0.06	0.03	0.01	0.01	0.00				
Copper Cu				0.47	0.24	0.06	0.07	0.02				
Iron Fe				65.89	29.77	11.43	13.43	3.54				
Lead Pb				0.03	0.01	0.00	0.00	0.00				
Lithium Li				1.61	0.76	0.24	0.29	0.08				
Magnesium Mg				2060	1054	365	403	106				
Manganese Mn				1.51	0.69	0.29	0.40	0.10				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.10	0.05	0.01	0.02	0.00				
Nickel Ni				0.23	0.11	0.03	0.03	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				1080	532	152	216	57				
Selenium Se				0.35	0.16	0.05	0.06	0.02				
Silicon SiO2				428	202	63	79	21				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				140667	133146	127877	128470	126316				
Strontium Sr				11	6	2	2	1				
Tellurium Te				16.56	7.79	2.43	3.04	0.80				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th				0.02	0.01	0.00	0.00	0.00				
Tin Sn				0.04	0.05	0.02	0.02	0.01				
Titanium Ti				5.02	2.36	0.74	0.92	0.24				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.61	0.28	0.07	0.08	0.02				
Zinc Zn				0.6	0.3	0.2	0.6	0.1				
Zirconium Zr				1.67	0.79	0.24	0.31	0.08				

Table H-6-A-1

Scenario 6

OUTPUT SUMMARY							Fraction of CCME in Doris Creek (%)
Discharge rate		500000 m3/year					
Degradation Field(age)		Tail Lk Cu < CME Year		20			
		MMER	CCME	Tail Lake Year 2	Doris Creek Year 3	L'Roberts L Year 3	
Maximum Concentration							
pH			6 to 9	7 to 8	7 to 8	7 to 8	
TDS	mg/L			732	160	170	
TSS	mg/L			4.6	6.9	8.1	
Free CN	mg/L		0.005	0.0030	0.00009	0.00004	2%
Total CN	mg/L	1.0		0.029	0.003	0.002	
WAD CN	mg/L			0.0040	0.0001	0.0001	
CNO	mg/L			3.3	0.09	0.05	
SCN	mg/L			0.101	0.003	0.001	
Sulphate	mg/L			93	5.4	5.9	
Chloride	mg/L			456	72	71	
Total Ammonia	mg/L		0.97	1.15	0.044	0.023	5%
Nitrate	mg/L		2.9	5.8	0.19	0.10	7%
Nitrite	mg/L		0.018	0.45	0.016	0.009	85%
Alkalinity	mg/L			56	28	26	
OrthoPhosphate-P	mg/L			0.1734	0.0057	0.0035	
Phosphate-P	mg/L			0.1766	0.0277	0.0265	
Org. Carbon	mg/L			6.2	7.5	7.1	
Hardness CaCO3	mg/L			111	47	45	
Total Metals							
Aluminum Al	mg/L		0.1	0.15	0.08	0.25	83%
Antimony Sb	mg/L			0.0158	0.0032	0.0019	
Arsenic As	mg/L	0.5	0.005	0.00	0.0006	0.0006	11%
Barium Ba	mg/L			0.0108	0.0033	0.0052	
Beryllium Be	mg/L			0.00061	0.00003	0.00002	
Bismuth Bi	mg/L			0.01523	0.00047	0.00032	
Boron B	mg/L			0.032	0.034	0.030	
Cadmium Cd	mg/L		0.000038	0.000057	0.0000048	0.0000156	13%
Calcium Ca	mg/L			252	15	11	
Chromium Cr	mg/L		0.001	0.0067	0.001	0.001	81%
Cobalt Co	mg/L			0.0105	0.0011	0.0005	
Copper Cu	mg/L	0.3	0.002	0.010	0.0017	0.0020	87%
Iron Fe	mg/L		0.3	0.18	0.13	0.28	42%
Lead Pb	mg/L	0.2	0.002	0.00040	0.00007	0.00026	4%
Lithium Li	mg/L			0.0049	0.0029	0.0029	
Magnesium Mg	mg/L			9.4	7.4	7.2	
Manganese Mn	mg/L			0.029	0.021	0.024	
Mercury Hg	mg/L		0.0001	0.0000117	0.0000009	0.0000008	1%
Molybdenum Mo	mg/L		0.073	0.0091	0.00041	0.00035	1%
Nickel Ni	mg/L	0.5	0.025	0.008	0.0008	0.0008	3%
Phosphorus P	mg/L			0.256	0.030	0.028	
Potassium K	mg/L			42	3.9	3.3	
Selenium Se	mg/L		0.001	0.00095	0.00090	0.00083	90%
Silicon SiO2	mg/L			4.0	0.61	0.56	
Silver Ag	mg/L		0.0001	0.00012	0.0000054	0.0000054	5%
Sodium Na	mg/L			178	43	40	
Strontium Sr	mg/L			0.090	0.043	0.046	
Tellurium Te	mg/L			0.050	0.050	0.051	
Thallium Tl	mg/L		0.0008	0.000043	0.000031	0.002001	4%
Thorium Th	mg/L			0.000042	0.0000024	0.0000012	
Tin Sn	mg/L			0.00241	0.00046	0.00004	
Titanium Ti	mg/L			0.0136	0.0062	0.0062	
Uranium U	mg/L			0.000070	0.000040	0.000044	
Vanadium V	mg/L			0.0035	0.0006	0.0005	
Zinc Zn	mg/L	0.5	0.03	0.023	0.0037	0.0054	12%
Zirconium Zr	mg/L			0.0051	0.0050	0.0051	

Table H-6-A-2
Scenario 6

Water Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter													
TDS	mg/L				140	123	127	148	149				
TSS	mg/L				3.9	5.8	5.9	6.9	6.9				
Free CN	mg/L				0.00004	0.00001	0.00001	0.00001	0.00001				
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L				0.0001	0.0000	0.0000	0.0000	0.0000				
CNO	mg/L				0.04	0.01	0.01	0.01	0.01				
SCN	mg/L				0.001	0.001	0.001	0.001	0.001				
Sulphate	mg/L				3.3	3.4	3.6	3.9	4.1				
Chloride	mg/L				61	62	60	65	65				
Total Ammonia	mg/L				0.014	0.029	0.022	0.022	0.023				
Nitrate	mg/L				0.05	0.07	0.09	0.10	0.11				
Nitrite	mg/L				0.007	0.009	0.008	0.008	0.008				
Alkalinity	mg/L				27	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0015	0.0017	0.0018	0.0021	0.0023				
Phosphate-P	mg/L				0.0169	0.0185	0.0245	0.0204	0.0206				
Org. Carbon	mg/L				5.4	5.1	7.4	5.0	5.0				
Hardness CaCO3	mg/L				45	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0009	0.0029	0.0006	0.0006				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0032				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00002				
Bismuth Bi	mg/L				0.00008	0.00013	0.00016	0.00018	0.00020				
Boron B	mg/L				0.034	0.022	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000035	0.0000037	0.0000033	0.0000034	0.0000035				
Calcium Ca	mg/L				10	10	10	10	10				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0002	0.0010	0.0002	0.0002				
Copper Cu	mg/L				0.0012	0.0016	0.0013	0.0016	0.0016				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00007	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.2	6.5	6.6	6.4	6.5				
Manganese Mn	mg/L				0.007	0.020	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00021	0.00022	0.00025	0.00025	0.00026				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0005	0.0005				
Phosphorus P	mg/L				0.018	0.020	0.026	0.022	0.022				
Potassium K	mg/L				3.0	2.7	2.7	2.7	2.8				
Selenium Se	mg/L				0.00088	0.00057	0.00061	0.00055	0.00055				
Silicon SiO2	mg/L				0.53	0.53	0.54	0.54	0.55				
Silver Ag	mg/L				0.0000035	0.0000042	0.0000040	0.0000041	0.0000042				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.040	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.049	0.049	0.049	0.049	0.049				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00040	0.00041	0.00041	0.00042	0.00042				
Titanium Ti	mg/L				0.0059	0.0059	0.0059	0.0059	0.0059				
Uranium U	mg/L				0.000026	0.000032	0.000039	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0010	0.0033	0.0030	0.0019	0.0020				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-6-A-2
Scenario 6

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter													
TDS	mg/L				149	130	134	154	155				
TSS	mg/L				4.0	5.8	5.9	6.9	6.9				
Free CN	mg/L				0.00009	0.00000	0.00001	0.00001	0.00001				
Total CN	mg/L				0.003	0.002	0.002	0.002	0.002				
WAD CN	mg/L				0.0001	0.0000	0.0000	0.0000	0.0000				
CNO	mg/L				0.09	0.00	0.01	0.01	0.01				
SCN	mg/L				0.002	0.002	0.002	0.002	0.002				
Sulphate	mg/L				4.8	4.7	4.8	5.1	5.2				
Chloride	mg/L				66	67	65	69	69				
Total Ammonia	mg/L				0.024	0.044	0.019	0.021	0.021				
Nitrate	mg/L				0.15	0.16	0.16	0.18	0.19				
Nitrite	mg/L				0.016	0.008	0.008	0.004	0.008				
Alkalinity	mg/L				28	26	28	27	27				
OrthoPhosphate-P	mg/L				0.0037	0.0036	0.0036	0.0037	0.0039				
Phosphate-P	mg/L				0.0191	0.0203	0.0262	0.0221	0.0222				
Org. Carbon	mg/L				5.4	5.1	7.4	5.0	5.0				
Hardness CaCO3	mg/L				47	44	44	45	46				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0006	0.0011	0.0031	0.0008	0.0008				
Arsenic As	mg/L				0.0005	0.0005	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0030	0.0033	0.0032	0.0033	0.0033				
Beryllium Be	mg/L				0.00002	0.00002	0.00002	0.00002	0.00002				
Bismuth Bi	mg/L				0.00027	0.00029	0.00030	0.00032	0.00034				
Boron B	mg/L				0.034	0.023	0.023	0.023	0.023				
Cadmium Cd	mg/L				0.0000045	0.0000045	0.0000040	0.0000041	0.0000042				
Calcium Ca	mg/L				14	13	13	13	13				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0003	0.0004	0.0011	0.0003	0.0003				
Copper Cu	mg/L				0.0014	0.0017	0.0014	0.0017	0.0017				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00003	0.00007	0.00005	0.00005	0.00005				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0029	0.0029				
Magnesium Mg	mg/L				7.3	6.6	6.7	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.014	0.011	0.011				
Mercury Hg	mg/L				0.0000008	0.0000008	0.0000008	0.0000008	0.0000008				
Molybdenum Mo	mg/L				0.00036	0.00035	0.00037	0.00037	0.00038				
Nickel Ni	mg/L				0.0006	0.0007	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.021	0.023	0.029	0.025	0.025				
Potassium K	mg/L				3.7	3.3	3.3	3.2	3.3				
Selenium Se	mg/L				0.00089	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.59	0.59	0.58	0.59	0.59				
Silver Ag	mg/L				0.0000044	0.0000049	0.0000046	0.0000047	0.0000048				
Sodium Na	mg/L				39	33	35	32	32				
Strontium Sr	mg/L				0.042	0.043	0.037	0.041	0.041				
Tellurium Te	mg/L				0.049	0.049	0.049	0.049	0.049				
Thallium Tl	mg/L				0.000030	0.000031	0.000031	0.000031	0.000031				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00043	0.00043	0.00044	0.00044	0.00044				
Titanium Ti	mg/L				0.0059	0.0059	0.0059	0.0060	0.0060				
Uranium U	mg/L				0.000027	0.000032	0.000040	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0014	0.0036	0.0033	0.0022	0.0022				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-6-A-2
Scenario 6

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter													
TDS	mg/L				153	134	137	157	157				
TSS	mg/L				4.0	5.8	5.9	6.9	6.9				
Free CN	mg/L				0.00005								
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L				0.0001								
CNO	mg/L				0.05								
SCN	mg/L				0.003	0.003	0.002	0.002	0.002				
Sulphate	mg/L				5.4	5.2	5.1	5.3	5.3				
Chloride	mg/L				70	70	68	72	72				
Total Ammonia	mg/L				0.018	0.029	0.017	0.016	0.016				
Nitrate	mg/L				0.19	0.19	0.19	0.19	0.19				
Nitrite	mg/L				0.013	0.007	0.007	0.003	0.003				
Alkalinity	mg/L				28	26	28	27	27				
OrthoPhosphate-P	mg/L				0.0050	0.0048	0.0047	0.0049	0.0050				
Phosphate-P	mg/L				0.0203	0.0216	0.0274	0.0232	0.0233				
Org. Carbon	mg/L				5.4	5.1	7.4	5.0	5.0				
Hardness CaCO3	mg/L				47	44	44	46	46				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0007	0.0012	0.0032	0.0009	0.0009				
Arsenic As	mg/L				0.0006	0.0005	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0031	0.0033	0.0032	0.0033	0.0033				
Beryllium Be	mg/L				0.00002	0.00002	0.00002	0.00002	0.00002				
Bismuth Bi	mg/L				0.00039	0.00040	0.00040	0.00042	0.00044				
Boron B	mg/L				0.034	0.023	0.023	0.023	0.023				
Cadmium Cd	mg/L				0.0000048	0.0000048	0.0000042	0.0000042	0.0000042				
Calcium Ca	mg/L				15	14	14	13	13				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0003	0.0004	0.0011	0.0003	0.0003				
Copper Cu	mg/L				0.0014	0.0017	0.0015	0.0017	0.0017				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00003	0.00007	0.00005	0.00005	0.00005				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.4	6.6	6.7	6.5	6.6				
Manganese Mn	mg/L				0.007	0.021	0.014	0.011	0.011				
Mercury Hg	mg/L				0.0000008	0.0000008	0.0000008	0.0000008	0.0000008				
Molybdenum Mo	mg/L				0.00041	0.00039	0.00040	0.00038	0.00038				
Nickel Ni	mg/L				0.0006	0.0008	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.023	0.024	0.030	0.026	0.026				
Potassium K	mg/L				3.9	3.5	3.4	3.3	3.3				
Selenium Se	mg/L				0.00089	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.61	0.60	0.60	0.60	0.60				
Silver Ag	mg/L				0.0000049	0.0000053	0.0000049	0.0000050	0.0000050				
Sodium Na	mg/L				40	33	35	32	32				
Strontium Sr	mg/L				0.042	0.043	0.037	0.041	0.041				
Tellurium Te	mg/L				0.049	0.049	0.049	0.049	0.049				
Thallium Tl	mg/L				0.000031	0.000031	0.000031	0.000031	0.000031				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00045	0.00045	0.00045	0.00045	0.00046				
Titanium Ti	mg/L				0.0059	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000027	0.000032	0.000040	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0015	0.0037	0.0034	0.0022	0.0022				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-6-A-2
Scenario 6

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter													
TDS	mg/L				154	135	137	157	157				
TSS	mg/L				4.0	5.8	5.9	6.9	6.9				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.002	0.002	0.002	0.002	0.002				
Sulphate	mg/L				5.1	4.8	4.8	5.0	4.9				
Chloride	mg/L				72	71	68	72	72				
Total Ammonia	mg/L				0.009	0.011	0.017	0.016	0.016				
Nitrate	mg/L				0.18	0.17	0.17	0.17	0.17				
Nitrite	mg/L				0.005	0.003	0.003	0.003	0.003				
Alkalinity	mg/L				28	26	28	27	27				
OrthoPhosphate-P	mg/L				0.0057	0.0054	0.0051	0.0051	0.0050				
Phosphate-P	mg/L				0.0211	0.0221	0.0277	0.0234	0.0234				
Org. Carbon	mg/L				5.4	5.1	7.4	5.0	5.0				
Hardness CaCO3	mg/L				47	44	44	45	45				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0008	0.0012	0.0032	0.0008	0.0008				
Arsenic As	mg/L				0.0005	0.0005	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0030	0.0033	0.0031	0.0032	0.0032				
Beryllium Be	mg/L				0.00003	0.00002	0.00002	0.00002	0.00002				
Bismuth Bi	mg/L				0.00047	0.00044	0.00041	0.00041	0.00041				
Boron B	mg/L				0.034	0.023	0.023	0.023	0.023				
Cadmium Cd	mg/L				0.0000046	0.0000046	0.0000040	0.0000040	0.0000041				
Calcium Ca	mg/L				14	13	13	12	12				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0003	0.0004	0.0011	0.0003	0.0003				
Copper Cu	mg/L				0.0014	0.0017	0.0014	0.0017	0.0017				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00003	0.00007	0.00005	0.00005	0.00005				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.3	6.6	6.7	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.014	0.010	0.010				
Mercury Hg	mg/L				0.0000008	0.0000008	0.0000008	0.0000008	0.0000008				
Molybdenum Mo	mg/L				0.00036	0.00034	0.00036	0.00034	0.00034				
Nickel Ni	mg/L				0.0006	0.0008	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.025	0.030	0.026	0.026				
Potassium K	mg/L				3.7	3.3	3.2	3.1	3.1				
Selenium Se	mg/L				0.00089	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.59	0.59	0.58	0.58	0.58				
Silver Ag	mg/L				0.0000051	0.0000054	0.0000050	0.0000050	0.0000050				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.042	0.043	0.037	0.041	0.041				
Tellurium Te	mg/L				0.049	0.049	0.049	0.050	0.050				
Thallium Tl	mg/L				0.000031	0.000031	0.000031	0.000031	0.000031				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00046	0.00046	0.00045	0.00045	0.00045				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000027	0.000032	0.000040	0.000034	0.000034				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0015	0.0036	0.0033	0.0022	0.0022				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-6-A-2
Scenario 6

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter													
TDS	mg/L				151	133	135	155	155				
TSS	mg/L				4.0	5.8	5.9	6.9	6.9				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.002	0.002	0.002	0.002	0.002				
Sulphate	mg/L				4.7	4.5	4.5	4.6	4.6				
Chloride	mg/L				70	69	67	71	71				
Total Ammonia	mg/L				0.008	0.011	0.017	0.016	0.016				
Nitrate	mg/L				0.15	0.15	0.14	0.14	0.14				
Nitrite	mg/L				0.003	0.003	0.003	0.003	0.003				
Alkalinity	mg/L				28	26	27	27	27				
OrthoPhosphate-P	mg/L				0.0049	0.0046	0.0044	0.0044	0.0044				
Phosphate-P	mg/L				0.0203	0.0214	0.0271	0.0227	0.0227				
Org. Carbon	mg/L				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3	mg/L				47	44	44	45	45				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0007	0.0012	0.0031	0.0008	0.0008				
Arsenic As	mg/L				0.0005	0.0005	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0030	0.0033	0.0031	0.0032	0.0032				
Beryllium Be	mg/L				0.00002	0.00002	0.00002	0.00002	0.00002				
Bismuth Bi	mg/L				0.00040	0.00038	0.00035	0.00035	0.00035				
Boron B	mg/L				0.034	0.023	0.023	0.023	0.023				
Cadmium Cd	mg/L				0.0000045	0.0000045	0.0000039	0.0000039	0.0000039				
Calcium Ca	mg/L				13	12	12	11	11				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0003	0.0003	0.0010	0.0003	0.0003				
Copper Cu	mg/L				0.0014	0.0017	0.0014	0.0016	0.0016				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00003	0.00007	0.00005	0.00005	0.00005				
Lithium Li	mg/L				0.0029	0.0029	0.0028	0.0029	0.0029				
Magnesium Mg	mg/L				7.3	6.6	6.7	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000008	0.0000008	0.0000008	0.0000008	0.0000008				
Molybdenum Mo	mg/L				0.00033	0.00031	0.00033	0.00031	0.00031				
Nickel Ni	mg/L				0.0006	0.0007	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.023	0.024	0.029	0.025	0.025				
Potassium K	mg/L				3.6	3.1	3.1	3.0	3.0				
Selenium Se	mg/L				0.00089	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.58	0.58	0.57	0.57	0.57				
Silver Ag	mg/L				0.0000051	0.0000054	0.0000050	0.0000050	0.0000050				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.043	0.037	0.041	0.041				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000031	0.000031	0.000031	0.000031	0.000031				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00045	0.00045	0.00044	0.00044	0.00044				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000027	0.000032	0.000040	0.000034	0.000034				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0014	0.0035	0.0032	0.0021	0.0021				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-6-A-2
Scenario 6

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter													
TDS	mg/L				150	131	134	153	153				
TSS	mg/L				4.0	5.8	5.9	6.9	6.9				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.002	0.002	0.001	0.001	0.001				
Sulphate	mg/L				4.4	4.2	4.2	4.4	4.4				
Chloride	mg/L				68	68	65	69	69				
Total Ammonia	mg/L				0.005	0.008	0.014	0.013	0.013				
Nitrate	mg/L				0.10	0.10	0.10	0.10	0.10				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				28	26	27	27	27				
OrthoPhosphate-P	mg/L				0.0043	0.0040	0.0038	0.0038	0.0038				
Phosphate-P	mg/L				0.0197	0.0208	0.0265	0.0222	0.0222				
Org. Carbon	mg/L				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3	mg/L				46	44	43	45	45				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0007	0.0011	0.0030	0.0007	0.0007				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0030	0.0033	0.0031	0.0032	0.0032				
Beryllium Be	mg/L				0.00002	0.00002	0.00002	0.00002	0.00002				
Bismuth Bi	mg/L				0.00034	0.00032	0.00030	0.00030	0.00030				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000036	0.0000036	0.0000030	0.0000030	0.0000031				
Calcium Ca	mg/L				12	12	11	11	11				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0010	0.0002	0.0002				
Copper Cu	mg/L				0.0013	0.0016	0.0014	0.0016	0.0016				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00003	0.00007	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00030	0.00029	0.00031	0.00029	0.00029				
Nickel Ni	mg/L				0.0005	0.0007	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.021	0.022	0.028	0.024	0.024				
Potassium K	mg/L				3.4	3.0	3.0	2.9	2.9				
Selenium Se	mg/L				0.00089	0.00057	0.00061	0.00055	0.00055				
Silicon SiO2	mg/L				0.56	0.56	0.56	0.56	0.56				
Silver Ag	mg/L				0.0000040	0.0000043	0.0000039	0.0000039	0.0000039				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.043	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00044	0.00044	0.00043	0.00043	0.00043				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000031	0.000039	0.000032	0.000032				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0013	0.0035	0.0031	0.0020	0.0020				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-6-A-2
Scenario 6

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter													
TDS	mg/L				148	129	132	152	152				
TSS	mg/L				4.0	5.8	5.9	6.9	6.9				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.001	0.001	0.001	0.001	0.001				
Sulphate	mg/L				4.1	4.0	4.0	4.2	4.2				
Chloride	mg/L				67	67	64	68	68				
Total Ammonia	mg/L				0.005	0.008	0.014	0.013	0.013				
Nitrate	mg/L				0.08	0.08	0.07	0.07	0.07				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				28	26	27	27	27				
OrthoPhosphate-P	mg/L				0.0037	0.0036	0.0034	0.0034	0.0034				
Phosphate-P	mg/L				0.0191	0.0203	0.0261	0.0217	0.0217				
Org. Carbon	mg/L				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3	mg/L				46	44	43	45	45				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0006	0.0011	0.0030	0.0007	0.0007				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0031	0.0032	0.0032				
Beryllium Be	mg/L				0.00002	0.00002	0.00002	0.00002	0.00002				
Bismuth Bi	mg/L				0.00029	0.00028	0.00026	0.00026	0.00026				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000035	0.0000035	0.0000029	0.0000029	0.0000029				
Calcium Ca	mg/L				12	11	11	10	10				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0010	0.0002	0.0002				
Copper Cu	mg/L				0.0013	0.0016	0.0014	0.0016	0.0016				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00003	0.00007	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00028	0.00027	0.00029	0.00027	0.00027				
Nickel Ni	mg/L				0.0005	0.0007	0.0006	0.0005	0.0005				
Phosphorus P	mg/L				0.021	0.022	0.027	0.023	0.023				
Potassium K	mg/L				3.3	2.9	2.9	2.8	2.8				
Selenium Se	mg/L				0.00089	0.00057	0.00061	0.00055	0.00055				
Silicon SiO2	mg/L				0.56	0.55	0.55	0.55	0.55				
Silver Ag	mg/L				0.0000040	0.0000042	0.0000038	0.0000038	0.0000038				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00043	0.00043	0.00043	0.00043	0.00043				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000031	0.000038	0.000032	0.000032				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0012	0.0034	0.0031	0.0020	0.0020				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-6-A-2
Scenario 6

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter													
TDS	mg/L				147	128	131	151	151				
TSS	mg/L				4.0	5.8	5.9	6.9	6.9				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.001	0.001	0.001	0.001	0.001				
Sulphate	mg/L				3.9	3.8	3.9	4.0	4.0				
Chloride	mg/L				66	66	63	67	67				
Total Ammonia	mg/L				0.005	0.008	0.014	0.013	0.013				
Nitrate	mg/L				0.06	0.05	0.05	0.05	0.05				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				28	26	27	27	27				
OrthoPhosphate-P	mg/L				0.0033	0.0032	0.0030	0.0030	0.0030				
Phosphate-P	mg/L				0.0187	0.0199	0.0257	0.0213	0.0213				
Org. Carbon	mg/L				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	45	45				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0006	0.0010	0.0030	0.0007	0.0007				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0031	0.0032	0.0032				
Beryllium Be	mg/L				0.00002	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00025	0.00024	0.00023	0.00023	0.00023				
Boron B	mg/L				0.034	0.022	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000034	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca	mg/L				11	10	10	10	10				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0010	0.0002	0.0002				
Copper Cu	mg/L				0.0013	0.0016	0.0013	0.0016	0.0016				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00007	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00026	0.00025	0.00027	0.00025	0.00025				
Nickel Ni	mg/L				0.0005	0.0007	0.0006	0.0005	0.0005				
Phosphorus P	mg/L				0.020	0.021	0.027	0.022	0.022				
Potassium K	mg/L				3.3	2.8	2.8	2.7	2.7				
Selenium Se	mg/L				0.00088	0.00057	0.00061	0.00055	0.00055				
Silicon SiO2	mg/L				0.55	0.55	0.55	0.55	0.55				
Silver Ag	mg/L				0.0000039	0.0000041	0.0000037	0.0000037	0.0000037				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00043	0.00043	0.00042	0.00042	0.00042				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000031	0.000038	0.000032	0.000032				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0012	0.0034	0.0030	0.0019	0.0019				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-6-A-2
Scenario 6

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter													
TDS	mg/L				146	127	130	150	150				
TSS	mg/L				4.0	5.8	5.9	6.9	6.9				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.001	0.001	0.001	0.001	0.001				
Sulphate	mg/L				3.8	3.6	3.7	3.8	3.8				
Chloride	mg/L				65	65	63	66	66				
Total Ammonia	mg/L				0.005	0.008	0.014	0.013	0.013				
Nitrate	mg/L				0.04	0.04	0.03	0.03	0.03				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				28	26	27	27	27				
OrthoPhosphate-P	mg/L				0.0029	0.0028	0.0027	0.0027	0.0027				
Phosphate-P	mg/L				0.0184	0.0196	0.0254	0.0210	0.0210				
Org. Carbon	mg/L				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0006	0.0010	0.0029	0.0006	0.0006				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00002	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00022	0.00021	0.00020	0.00020	0.00020				
Boron B	mg/L				0.034	0.022	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000032	0.0000032	0.0000027	0.0000027	0.0000027				
Calcium Ca	mg/L				11	10	10	9	9				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0002	0.0010	0.0002	0.0002				
Copper Cu	mg/L				0.0013	0.0016	0.0013	0.0016	0.0016				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00007	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00025	0.00024	0.00026	0.00024	0.00024				
Nickel Ni	mg/L				0.0005	0.0006	0.0005	0.0005	0.0005				
Phosphorus P	mg/L				0.019	0.021	0.026	0.022	0.022				
Potassium K	mg/L				3.2	2.8	2.7	2.7	2.7				
Selenium Se	mg/L				0.00088	0.00057	0.00061	0.00055	0.00055				
Silicon SiO2	mg/L				0.54	0.54	0.54	0.54	0.54				
Silver Ag	mg/L				0.0000038	0.0000040	0.0000036	0.0000036	0.0000036				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00042	0.00042	0.00042	0.00042	0.00042				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000031	0.000038	0.000032	0.000032				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn	mg/L				0.0012	0.0033	0.0030	0.0019	0.0019				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-6-A-2
Scenario 6

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16
Parameter												
TDS	mg/L				145	129	135	157	159			
TSS	mg/L				4.0	5.8	5.9	6.9	6.9			
Free CN	mg/L											
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002			
WAD CN	mg/L											
CNO	mg/L											
SCN	mg/L				0.001	0.001	0.001	0.001	0.001			
Sulphate	mg/L				3.6	3.5	3.6	3.7	3.7			
Chloride	mg/L				64	66	65	71	72			
Total Ammonia	mg/L				0.005	0.008	0.014	0.013	0.013			
Nitrate	mg/L				0.02	0.02	0.02	0.02	0.02			
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002			
Alkalinity	mg/L				28	26	27	27	27			
OrthoPhosphate-P	mg/L				0.0026	0.0025	0.0024	0.0024	0.0024			
Phosphate-P	mg/L				0.0181	0.0193	0.0252	0.0208	0.0208			
Org. Carbon	mg/L				5.5	5.1	7.4	5.0	5.0			
Hardness CaCO3	mg/L				46	43	43	44	44			
Total Metals												
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07			
Antimony Sb	mg/L				0.0005	0.0010	0.0029	0.0006	0.0006			
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004			
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031			
Beryllium Be	mg/L				0.00002	0.00001	0.00001	0.00001	0.00001			
Bismuth Bi	mg/L				0.00019	0.00019	0.00018	0.00018	0.00018			
Boron B	mg/L				0.034	0.022	0.023	0.022	0.022			
Cadmium Cd	mg/L				0.0000031	0.0000031	0.0000026	0.0000026	0.0000026			
Calcium Ca	mg/L				11	10	10	10	10			
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000			
Cobalt Co	mg/L				0.0001	0.0002	0.0009	0.0002	0.0002			
Copper Cu	mg/L				0.0013	0.0016	0.0013	0.0015	0.0015			
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09			
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004			
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028			
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5			
Manganese Mn	mg/L				0.007	0.020	0.013	0.010	0.010			
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007			
Molybdenum Mo	mg/L				0.00023	0.00023	0.00025	0.00023	0.00023			
Nickel Ni	mg/L				0.0005	0.0006	0.0005	0.0005	0.0005			
Phosphorus P	mg/L				0.019	0.020	0.026	0.022	0.022			
Potassium K	mg/L				3.1	2.7	2.7	2.6	2.6			
Selenium Se	mg/L				0.00088	0.00057	0.00061	0.00055	0.00055			
Silicon SiO2	mg/L				0.54	0.54	0.54	0.54	0.54			
Silver Ag	mg/L				0.0000037	0.0000039	0.0000035	0.0000035	0.0000035			
Sodium Na	mg/L				39	34	36	35	35			
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040			
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050			
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030			
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001			
Tin Sn	mg/L				0.00042	0.00042	0.00042	0.00042	0.00042			
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060			
Uranium U	mg/L				0.000026	0.000031	0.000038	0.000032	0.000032			
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0002	0.0002			
Zinc Zn	mg/L				0.0011	0.0033	0.0030	0.0019	0.0019			
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050			

Table H 6-A-3
Scenario 6**Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter												
TDS				1040585	565837	246575	365977	128486				
TSS				29130	26476	11394	16998	5934				
Free CN				0.30	0.04	0.02	0.03	0.01				
Total CN				18	9	4	5	2				
WAD CN				0.40	0.06	0.03	0.04	0.01				
CNO				332	46	26	34	12				
SCN				5	3	2	3	1				
Sulphate				24484	15496	7008	9716	3531				
Chloride				451672	283540	116668	160465	56527				
Total Ammonia				101	132	42	56	20				
Nitrate				403	342	169	248	98				
Nitrite				51	39	16	21	7				
Alkalinity				202267	116511	52264	65901	23068				
OrthoPhosphate-P				11	8	4	5	2				
Phosphate-P				125	85	47	51	18				
Org. Carbon				40173	23317	14295	12286	4289				
Hardness CaCO3				334787	196285	82473	109605	38397				
Total Metals												
Aluminum Al				247	272	154	177	62				
Antimony Sb				3.0	4.2	5.6	1.5	0.5				
Arsenic As				3.6	2.0	0.8	1.0	0.4				
Barium Ba				21	15	6	8	3				
Beryllium Be				0.10	0.06	0.03	0.04	0.01				
Bismuth Bi				0.58	0.59	0.30	0.44	0.18				
Boron B				251	103	45	55	19				
Cadmium Cd				0.03	0.02	0.01	0.01	0.00				
Calcium Ca				72882	43761	18583	24190	8810				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.83	0.98	1.85	0.46	0.18				
Copper Cu				9	7	3	4	1				
Iron Fe				374	563	161	220	77				
Lead Pb				0.17	0.30	0.08	0.11	0.04				
Lithium Li				21	13	5	7	2				
Magnesium Mg				53258	29837	12706	15955	5580				
Manganese Mn				49	94	26	25	9				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.55	0.99	0.49	0.62	0.23				
Nickel Ni				3.33	2.87	1.03	1.28	0.46				
Phosphorus P				132	90	50	54	19				
Potassium K				22294	12294	5240	6731	2410				
Selenium Se				6.53	2.60	1.19	1.37	0.48				
Silicon SiO2				3898	2453	1042	1350	477				
Silver Ag				0.03	0.02	0.01	0.01	0.00				
Sodium Na				286073	150174	65817	78976	27624				
Strontium Sr				298	192	69	99	35				
Tellurium Te				365	227	96	122	43				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				2.96	1.87	0.80	1.03	0.36				
Titanium Ti				44	27	11	15	5				
Uranium U				0.20	0.14	0.08	0.08	0.03				
Vanadium V				4.15	0.37	0.52	0.45	0.16				
Zinc Zn				7.64	14.99	5.77	4.73	1.69				
Zirconium Zr				37	23	10	12	4				

Table H 6-A-3
Scenario 6**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter												
TDS				1102048	599384	259319	381774	133801				
TSS				29283	26552	11423	17034	5946				
Free CN				0.64	0.02	0.02	0.03	0.01				
Total CN				21	9	4	5	2				
WAD CN				0.85	0.02	0.03	0.03	0.01				
CNO				704	20	22	28	10				
SCN				17	10	4	6	2				
Sulphate				35808	21692	9357	12626	4511				
Chloride				492642	305801	125084	170889	60030				
Total Ammonia				175	203	37	53	19				
Nitrate				1078	737	318	441	162				
Nitrite				115	37	15	9	7				
Alkalinity				207660	119412	53363	67263	23526				
OrthoPhosphate-P				27	17	7	9	3				
Phosphate-P				141	93	51	55	19				
Org. Carbon				40211	23321	14296	12287	4289				
Hardness CaCO3				346340	202558	84850	112551	39388				
Total Metals												
Aluminum Al				252	275	155	178	62				
Antimony Sb				4.5	5.0	5.9	1.9	0.7				
Arsenic As				4.0	2.1	0.8	1.1	0.4				
Barium Ba				22	15	6	8	3				
Beryllium Be				0.15	0.09	0.04	0.05	0.02				
Bismuth Bi				2.03	1.36	0.59	0.80	0.29				
Boron B				253	104	45	56	20				
Cadmium Cd				0.03	0.02	0.01	0.01	0.00				
Calcium Ca				103419	60555	24964	32098	11473				
Chromium Cr				6	2	1	1	0				
Cobalt Co				2.11	1.68	2.12	0.79	0.29				
Copper Cu				10	8	3	4	1				
Iron Fe				378	565	162	221	77				
Lead Pb				0.22	0.33	0.09	0.12	0.04				
Lithium Li				21	13	6	7	2				
Magnesium Mg				54161	30320	12889	16181	5656				
Manganese Mn				52	96	26	26	9				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				2.66	1.61	0.73	0.91	0.33				
Nickel Ni				4.33	3.41	1.23	1.54	0.55				
Phosphorus P				159	104	55	61	21				
Potassium K				27331	15063	6292	8035	2849				
Selenium Se				6.57	2.62	1.19	1.38	0.48				
Silicon SiO2				4335	2691	1132	1462	514				
Silver Ag				0.03	0.02	0.01	0.01	0.00				
Sodium Na				290978	152831	66825	80225	28044				
Strontium Sr				308	197	71	102	36				
Tellurium Te				365	227	96	122	43				
Thallium Tl				0.23	0.14	0.06	0.08	0.03				
Thorium Th				0.01	0.01	0.00	0.01	0.00				
Tin Sn				3.19	1.99	0.84	1.09	0.38				
Titanium Ti				44	27	12	15	5				
Uranium U				0.20	0.15	0.08	0.08	0.03				
Vanadium V				4.51	0.56	0.59	0.54	0.19				
Zinc Zn				10.44	16.53	6.35	5.45	1.93				
Zirconium Zr				37	23	10	12	4				

Table H 6-A-3
Scenario 6**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter												
TDS				1132851	616758	265764	389284	136155				
TSS				29347	26583	11432	17042	5948				
Free CN				0.35								
Total CN				18	9	4	5	2				
WAD CN				0.46								
CNO				380								
SCN				21	12	5	6	2				
Sulphate				40002	23740	9968	13116	4581				
Chloride				516963	320240	130803	178128	62517				
Total Ammonia				137	133	33	40	14				
Nitrate				1394	883	360	477	168				
Nitrite				96	30	13	8	3				
Alkalinity				209585	120316	53616	67435	23533				
OrthoPhosphate-P				37	22	9	12	4				
Phosphate-P				151	99	53	57	20				
Org. Carbon				40250	23341	14304	12297	4293				
Hardness CaCO3				350376	204449	85371	112888	39392				
Total Metals												
Aluminum Al				254	276	156	179	62				
Antimony Sb				5.4	5.5	6.1	2.1	0.8				
Arsenic As				4.1	2.2	0.9	1.1	0.4				
Barium Ba				23	15	6	8	3				
Beryllium Be				0.18	0.10	0.04	0.06	0.02				
Bismuth Bi				2.88	1.85	0.78	1.04	0.38				
Boron B				255	105	45	56	20				
Cadmium Cd				0.04	0.02	0.01	0.01	0.00				
Calcium Ca				113737	65362	26257	32861	11433				
Chromium Cr				6	2	1	1	0				
Cobalt Co				2.56	1.90	2.18	0.83	0.29				
Copper Cu				11	8	3	4	1				
Iron Fe				380	566	162	222	77				
Lead Pb				0.24	0.34	0.10	0.12	0.04				
Lithium Li				21	13	6	7	2				
Magnesium Mg				54522	30499	12944	16231	5666				
Manganese Mn				54	96	26	26	9				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				3.03	1.78	0.77	0.93	0.32				
Nickel Ni				4.71	3.60	1.29	1.59	0.55				
Phosphorus P				173	112	58	64	23				
Potassium K				29028	15853	6504	8159	2841				
Selenium Se				6.58	2.63	1.19	1.38	0.48				
Silicon SiO2				4492	2764	1153	1476	515				
Silver Ag				0.04	0.02	0.01	0.01	0.00				
Sodium Na				292700	153639	67049	80372	28047				
Strontium Sr				311	199	72	102	36				
Tellurium Te				365	227	96	123	43				
Thallium Tl				0.23	0.14	0.06	0.08	0.03				
Thorium Th				0.02	0.01	0.00	0.01	0.00				
Tin Sn				3.32	2.07	0.87	1.12	0.39				
Titanium Ti				44	27	12	15	5				
Uranium U				0.20	0.15	0.08	0.08	0.03				
Vanadium V				4.69	0.66	0.63	0.58	0.21				
Zinc Zn				11.46	17.02	6.50	5.56	1.94				
Zirconium Zr				37	23	10	12	4				

Table H 6-A-3
Scenario 6**Solute Loadings in DSolute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter												
TDS				1139656	619162	266082	388749	135647				
TSS				29346	26582	11432	17043	5948				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				17	10	4	5	2				
Sulphate				37496	22175	9327	12270	4275				
Chloride				531838	326284	132271	178919	62406				
Total Ammonia				68	52	33	40	14				
Nitrate				1301	793	321	413	145				
Nitrite				38	12	5	6	2				
Alkalinity				208294	119596	53347	67103	23422				
OrthoPhosphate-P				42	25	10	13	4				
Phosphate-P				156	102	54	58	20				
Org. Carbon				40340	23391	14324	12323	4302				
Hardness CaCO3				347273	202718	84722	112080	39118				
Total Metals												
Aluminum Al				254	276	156	179	62				
Antimony Sb				6.0	5.6	6.1	2.1	0.7				
Arsenic As				4.0	2.2	0.8	1.1	0.4				
Barium Ba				22	15	6	8	3				
Beryllium Be				0.19	0.11	0.04	0.06	0.02				
Bismuth Bi				3.46	2.02	0.80	1.02	0.36				
Boron B				255	105	45	56	20				
Cadmium Cd				0.03	0.02	0.01	0.01	0.00				
Calcium Ca				104141	59972	24206	30282	10551				
Chromium Cr				6	2	1	1	0				
Cobalt Co				2.20	1.69	2.10	0.73	0.25				
Copper Cu				10	8	3	4	1				
Iron Fe				379	566	162	222	77				
Lead Pb				0.23	0.34	0.10	0.12	0.04				
Lithium Li				21	13	6	7	2				
Magnesium Mg				54414	30423	12912	16187	5650				
Manganese Mn				53	96	26	26	9				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				2.68	1.58	0.70	0.84	0.29				
Nickel Ni				4.50	3.46	1.24	1.51	0.53				
Phosphorus P				176	114	59	64	22				
Potassium K				27436	14961	6166	7734	2696				
Selenium Se				6.58	2.62	1.19	1.38	0.48				
Silicon SiO2				4379	2699	1128	1445	504				
Silver Ag				0.04	0.02	0.01	0.01	0.00				
Sodium Na				291414	152920	66779	80036	27933				
Strontium Sr				309	197	71	101	35				
Tellurium Te				366	227	96	123	43				
Thallium Tl				0.23	0.14	0.06	0.08	0.03				
Thorium Th				0.02	0.01	0.00	0.01	0.00				
Tin Sn				3.41	2.10	0.88	1.12	0.39				
Titanium Ti				44	27	12	15	5				
Uranium U				0.20	0.15	0.08	0.08	0.03				
Vanadium V				4.74	0.66	0.62	0.57	0.20				
Zinc Zn				10.80	16.62	6.34	5.36	1.87				
Zirconium Zr				37	23	10	12	4				

Table H 6-A-3
Scenario 6**Solute Loadings in D**Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)

Date	Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter												
TDS				1122345	609222	262219	383820	133936				
TSS				29359	26589	11435	17046	5949				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				14	8	3	4	1				
Sulphate				34844	20654	8735	11515	4013				
Chloride				517502	318061	129072	174839	60991				
Total Ammonia				60	53	33	40	14				
Nitrate				1109	671	273	352	123				
Nitrite				19	12	5	6	2				
Alkalinity				207548	119165	53181	66890	23348				
OrthoPhosphate-P				36	21	9	11	4				
Phosphate-P				150	98	52	56	20				
Org. Carbon				40430	23441	14343	12349	4311				
Hardness CaCO3				345349	201611	84292	111532	38928				
Total Metals												
Aluminum Al				254	276	155	178	62				
Antimony Sb				5.4	5.3	6.0	1.9	0.7				
Arsenic As				4.0	2.1	0.8	1.1	0.4				
Barium Ba				22	15	6	8	3				
Beryllium Be				0.18	0.10	0.04	0.05	0.02				
Bismuth Bi				2.95	1.72	0.68	0.88	0.30				
Boron B				254	105	45	56	20				
Cadmium Cd				0.03	0.02	0.01	0.01	0.00				
Calcium Ca				97489	56157	22722	28389	9894				
Chromium Cr				6	2	1	1	0				
Cobalt Co				1.91	1.52	2.03	0.64	0.22				
Copper Cu				10	8	3	4	1				
Iron Fe				379	566	162	222	77				
Lead Pb				0.23	0.33	0.09	0.12	0.04				
Lithium Li				21	13	6	7	2				
Magnesium Mg				54271	30340	12880	16146	5635				
Manganese Mn				52	95	26	26	9				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				2.44	1.44	0.64	0.77	0.27				
Nickel Ni				4.27	3.33	1.18	1.45	0.50				
Phosphorus P				168	109	57	62	22				
Potassium K				26348	14337	5923	7424	2589				
Selenium Se				6.58	2.62	1.19	1.38	0.48				
Silicon SiO2				4300	2654	1111	1422	497				
Silver Ag				0.04	0.02	0.01	0.01	0.00				
Sodium Na				290618	152461	66601	79809	27854				
Strontium Sr				307	196	71	101	35				
Tellurium Te				367	228	96	123	43				
Thallium Tl				0.23	0.14	0.06	0.08	0.03				
Thorium Th				0.02	0.01	0.00	0.01	0.00				
Tin Sn				3.34	2.06	0.86	1.10	0.38				
Titanium Ti				44	27	12	15	5				
Uranium U				0.20	0.15	0.08	0.08	0.03				
Vanadium V				4.64	0.61	0.60	0.54	0.19				
Zinc Zn				10.20	16.28	6.21	5.19	1.81				
Zirconium Zr				37	23	10	12	4				

Table H 6-A-3
Scenario 6**Solute Loadings in D**Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)

Date	Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter												
TDS				1108245	601104	259055	379782	132534				
TSS				29370	26595	11438	17049	5950				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				12	7	3	4	1				
Sulphate				32507	19303	8204	10837	3778				
Chloride				505824	311347	126453	171496	59831				
Total Ammonia				36	38	27	32	11				
Nitrate				749	454	185	239	84				
Nitrite				15	9	4	5	2				
Alkalinity				206941	118813	53044	66715	23287				
OrthoPhosphate-P				32	19	7	10	3				
Phosphate-P				146	96	51	55	19				
Org. Carbon				40503	23483	14360	12370	4318				
Hardness CaCO3				343783	200707	83941	111083	38772				
Total Metals												
Aluminum Al				248	272	154	177	62				
Antimony Sb				5.0	5.1	5.9	1.8	0.6				
Arsenic As				3.8	2.0	0.8	1.0	0.3				
Barium Ba				22	15	6	8	3				
Beryllium Be				0.15	0.08	0.03	0.04	0.01				
Bismuth Bi				2.51	1.47	0.58	0.75	0.26				
Boron B				253	104	45	55	19				
Cadmium Cd				0.03	0.02	0.01	0.01	0.00				
Calcium Ca				91768	52855	21428	26737	9320				
Chromium Cr				5	2	1	1	0				
Cobalt Co				1.65	1.37	1.97	0.57	0.20				
Copper Cu				10	8	3	4	1				
Iron Fe				378	565	162	221	77				
Lead Pb				0.19	0.31	0.09	0.11	0.04				
Lithium Li				21	13	6	7	2				
Magnesium Mg				54124	30254	12846	16102	5620				
Manganese Mn				51	95	26	25	9				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				2.24	1.33	0.60	0.71	0.25				
Nickel Ni				4.05	3.21	1.13	1.39	0.48				
Phosphorus P				158	103	54	59	20				
Potassium K				25455	13823	5722	7168	2500				
Selenium Se				6.56	2.61	1.19	1.37	0.48				
Silicon SiO2				4179	2582	1081	1385	484				
Silver Ag				0.03	0.02	0.01	0.01	0.00				
Sodium Na				289961	152082	66454	79621	27789				
Strontium Sr				305	195	71	100	35				
Tellurium Te				367	228	96	123	43				
Thallium Tl				0.22	0.14	0.06	0.08	0.03				
Thorium Th				0.01	0.00	0.00	0.00	0.00				
Tin Sn				3.26	2.01	0.84	1.08	0.38				
Titanium Ti				44	27	12	15	5				
Uranium U				0.19	0.14	0.07	0.08	0.03				
Vanadium V				4.52	0.53	0.57	0.50	0.18				
Zinc Zn				9.60	15.93	6.07	5.01	1.75				
Zirconium Zr				37	23	10	12	4				

Table H 6-A-3
Scenario 6**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter												
TDS				1096682	594430	256448	376453	131378				
TSS				29379	26600	11440	17052	5951				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				10	6	2	3	1				
Sulphate				30734	18277	7802	10322	3599				
Chloride				496246	305827	124294	168739	58874				
Total Ammonia				36	36	26	31	11				
Nitrate				606	355	141	181	63				
Nitrite				15	9	4	5	2				
Alkalinity				206443	118523	52932	66572	23237				
OrthoPhosphate-P				28	16	7	8	3				
Phosphate-P				142	93	51	54	19				
Org. Carbon				40563	23516	14373	12387	4324				
Hardness CaCO3				342499	199964	83651	110713	38643				
Total Metals												
Aluminum Al				248	272	154	176	62				
Antimony Sb				4.6	4.9	5.8	1.7	0.6				
Arsenic As				3.8	2.0	0.8	1.0	0.3				
Barium Ba				22	15	6	8	3				
Beryllium Be				0.14	0.07	0.03	0.04	0.01				
Bismuth Bi				2.17	1.27	0.51	0.65	0.23				
Boron B				253	103	45	55	19				
Cadmium Cd				0.03	0.02	0.01	0.01	0.00				
Calcium Ca				87323	50285	20421	25449	8873				
Chromium Cr				5	2	1	1	0				
Cobalt Co				1.45	1.26	1.93	0.51	0.18				
Copper Cu				10	7	3	4	1				
Iron Fe				378	565	162	221	77				
Lead Pb				0.19	0.31	0.08	0.10	0.04				
Lithium Li				21	13	5	7	2				
Magnesium Mg				54028	30197	12824	16074	5610				
Manganese Mn				51	95	26	25	9				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				2.07	1.23	0.56	0.67	0.23				
Nickel Ni				3.90	3.12	1.10	1.34	0.47				
Phosphorus P				153	100	53	57	20				
Potassium K				24728	13404	5558	6959	2427				
Selenium Se				6.56	2.61	1.19	1.37	0.48				
Silicon SiO2				4126	2550	1068	1368	478				
Silver Ag				0.03	0.02	0.01	0.01	0.00				
Sodium Na				289430	151773	66334	79467	27735				
Strontium Sr				304	195	70	100	35				
Tellurium Te				368	228	96	123	43				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.01	0.00	0.00	0.00	0.00				
Tin Sn				3.21	1.98	0.83	1.06	0.37				
Titanium Ti				44	27	12	15	5				
Uranium U				0.19	0.14	0.07	0.08	0.03				
Vanadium V				4.45	0.49	0.56	0.48	0.17				
Zinc Zn				9.20	15.70	5.97	4.89	1.71				
Zirconium Zr				37	23	10	12	4				

Table H 6-A-3
Scenario 6**Solute Loadings in DSolute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter												
TDS				1087138	588909	254287	373692	130419				
TSS				29387	26604	11441	17054	5952				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				9	5	2	3	1				
Sulphate				29254	17422	7466	9894	3450				
Chloride				488340	301261	122504	166453	58079				
Total Ammonia				36	36	26	31	11				
Nitrate				430	252	101	129	45				
Nitrite				14	9	4	5	2				
Alkalinity				206033	118284	52839	66453	23196				
OrthoPhosphate-P				24	14	6	7	3				
Phosphate-P				139	91	50	53	18				
Org. Carbon				40613	23544	14384	12401	4329				
Hardness CaCO3				341439	199349	83411	110406	38536				
Total Metals												
Aluminum Al				247	271	154	176	62				
Antimony Sb				4.3	4.7	5.8	1.6	0.6				
Arsenic As				3.7	2.0	0.8	1.0	0.3				
Barium Ba				22	15	6	8	3				
Beryllium Be				0.13	0.07	0.03	0.04	0.01				
Bismuth Bi				1.88	1.11	0.44	0.57	0.20				
Boron B				252	103	45	55	19				
Cadmium Cd				0.02	0.02	0.01	0.01	0.00				
Calcium Ca				83623	48149	19583	24379	8501				
Chromium Cr				5	2	1	1	0				
Cobalt Co				1.29	1.16	1.89	0.47	0.16				
Copper Cu				10	7	3	4	1				
Iron Fe				378	565	162	221	77				
Lead Pb				0.18	0.30	0.08	0.10	0.04				
Lithium Li				21	13	5	7	2				
Magnesium Mg				53946	30150	12805	16050	5602				
Manganese Mn				50	94	26	25	9				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.94	1.15	0.53	0.63	0.22				
Nickel Ni				3.77	3.04	1.07	1.30	0.45				
Phosphorus P				148	97	52	56	19				
Potassium K				24128	13057	5422	6785	2367				
Selenium Se				6.56	2.61	1.19	1.37	0.48				
Silicon SiO2				4077	2521	1057	1354	473				
Silver Ag				0.03	0.02	0.01	0.01	0.00				
Sodium Na				288990	151518	66234	79340	27691				
Strontium Sr				303	194	70	100	35				
Tellurium Te				368	229	96	123	43				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.01	0.00	0.00	0.00	0.00				
Tin Sn				3.17	1.95	0.82	1.05	0.37				
Titanium Ti				44	28	12	15	5				
Uranium U				0.19	0.14	0.07	0.08	0.03				
Vanadium V				4.39	0.45	0.54	0.47	0.16				
Zinc Zn				8.86	15.50	5.90	4.79	1.68				
Zirconium Zr				37	23	10	12	4				

Table H 6-A-3
Scenario 6**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter												
TDS				1079213	584314	252484	371388	129618				
TSS				29393	26607	11443	17056	5953				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				7	4	2	2	1				
Sulphate				28024	16710	7187	9537	3326				
Chloride				481774	297461	121011	164545	57417				
Total Ammonia				36	36	26	31	11				
Nitrate				282	167	67	86	30				
Nitrite				14	9	4	5	2				
Alkalinity				205693	118085	52761	66353	23161				
OrthoPhosphate-P				22	13	5	7	2				
Phosphate-P				136	90	49	52	18				
Org. Carbon				40654	23568	14394	12413	4333				
Hardness CaCO3				340559	198838	83210	110150	38447				
Total Metals												
Aluminum Al				247	271	154	176	61				
Antimony Sb				4.1	4.6	5.7	1.6	0.5				
Arsenic As				3.7	1.9	0.8	1.0	0.3				
Barium Ba				22	15	6	8	3				
Beryllium Be				0.12	0.06	0.03	0.03	0.01				
Bismuth Bi				1.64	0.97	0.39	0.50	0.17				
Boron B				252	103	45	55	19				
Cadmium Cd				0.02	0.01	0.01	0.01	0.00				
Calcium Ca				80551	46372	18885	23487	8192				
Chromium Cr				5	1	1	1	0				
Cobalt Co				1.16	1.09	1.86	0.43	0.15				
Copper Cu				9	7	3	4	1				
Iron Fe				378	565	162	221	77				
Lead Pb				0.17	0.30	0.08	0.10	0.04				
Lithium Li				21	13	5	7	2				
Magnesium Mg				53878	30110	12790	16030	5595				
Manganese Mn				50	94	26	25	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.82	1.09	0.50	0.59	0.21				
Nickel Ni				3.66	2.98	1.05	1.27	0.44				
Phosphorus P				144	95	51	55	19				
Potassium K				23629	12769	5309	6640	2317				
Selenium Se				6.55	2.61	1.19	1.37	0.48				
Silicon SiO2				4037	2498	1048	1342	469				
Silver Ag				0.03	0.02	0.01	0.01	0.00				
Sodium Na				288625	151305	66151	79234	27654				
Strontium Sr				302	194	70	99	35				
Tellurium Te				369	229	96	123	43				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.00	0.00	0.00	0.00	0.00				
Tin Sn				3.13	1.93	0.81	1.04	0.36				
Titanium Ti				44	28	12	15	5				
Uranium U				0.19	0.14	0.07	0.08	0.03				
Vanadium V				4.34	0.43	0.53	0.45	0.16				
Zinc Zn				8.58	15.34	5.83	4.71	1.65				
Zirconium Zr				37	23	10	12	4				

Table H 6-A-3
Scenario 6**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16	Year 10 Jan-17
Parameter												
TDS				1072597	592639	260832	388572	137895				
TSS				29398	26629	11456	17074	5960				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN				6	4	1	2	1				
Sulphate				26997	16115	6952	9238	3222				
Chloride				476292	302233	126084	175040	62487				
Total Ammonia				36	36	26	31	11				
Nitrate				158	94	38	49	17				
Nitrite				14	9	4	5	2				
Alkalinity				205409	117918	52696	66270	23132				
OrthoPhosphate-P				20	12	5	6	2				
Phosphate-P				134	89	49	52	18				
Org. Carbon				40689	23587	14402	12423	4336				
Hardness CaCO3				339825	198410	83043	109935	38372				
Total Metals												
Aluminum Al				246	272	155	177	62				
Antimony Sb				3.9	4.5	5.7	1.5	0.5				
Arsenic As				3.6	1.9	0.7	1.0	0.3				
Barium Ba				21	15	6	8	3				
Beryllium Be				0.12	0.06	0.02	0.03	0.01				
Bismuth Bi				1.44	0.85	0.34	0.44	0.15				
Boron B				252	103	45	55	19				
Cadmium Cd				0.02	0.01	0.01	0.01	0.00				
Calcium Ca				77985	45618	18889	23878	8464				
Chromium Cr				5	1	1	1	0				
Cobalt Co				1.05	1.02	1.84	0.39	0.14				
Copper Cu				9	7	3	4	1				
Iron Fe				378	566	163	222	78				
Lead Pb				0.17	0.30	0.08	0.10	0.03				
Lithium Li				21	13	5	7	2				
Magnesium Mg				53821	30100	12790	16033	5597				
Manganese Mn				50	94	26	25	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.73	1.04	0.48	0.57	0.20				
Nickel Ni				3.57	2.93	1.03	1.25	0.43				
Phosphorus P				141	93	50	54	19				
Potassium K				23213	12545	5225	6534	2280				
Selenium Se				6.55	2.61	1.19	1.37	0.48				
Silicon SiO2				4003	2482	1043	1336	466				
Silver Ag				0.03	0.02	0.01	0.01	0.00				
Sodium Na				288321	155487	69543	85757	30697				
Strontium Sr				302	193	70	99	35				
Tellurium Te				369	229	96	124	43				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.00	0.00	0.00	0.00	0.00				
Tin Sn				3.10	1.92	0.81	1.03	0.36				
Titanium Ti				44	28	12	15	5				
Uranium U				0.19	0.14	0.07	0.08	0.03				
Vanadium V				4.30	0.42	0.53	0.45	0.16				
Zinc Zn				8.34	15.21	5.79	4.65	1.63				
Zirconium Zr				37	23	10	12	4				

Table H-6-A-1

Scenario 6

OUTPUT SUMMARY							Fraction of CCME in Doris Creek (%)	
Discharge rate		500000 m3/year						
Degradation Field(age)		Tail Lk Cu < CME Year		20				
		MMER	CCME	Tail Lake Year 2	Doris Creek Year 3	L'Roberts L Year 3		
Maximum Concentration								
pH			6 to 9	7 to 8	7 to 8	7 to 8	2%	
TDS	mg/L			732	160	170		
TSS	mg/L			4.6	6.9	8.1		
Free CN	mg/L		0.005	0.0030	0.00009	0.00004		
Total CN	mg/L	1.0		0.029	0.003	0.002		
WAD CN	mg/L			0.0040	0.0001	0.0001		
CNO	mg/L			3.3	0.09	0.05		
SCN	mg/L			0.101	0.003	0.001		
Sulphate	mg/L			93	5.4	5.9		
Chloride	mg/L			456	72	71		
Total Ammonia	mg/L		0.97	1.15	0.044	0.023		5%
Nitrate	mg/L		2.9	5.8	0.19	0.10		7%
Nitrite	mg/L		0.018	0.45	0.016	0.009		85%
Alkalinity	mg/L			56	28	26		
OrthoPhosphate-P	mg/L			0.1734	0.0057	0.0035		
Phosphate-P	mg/L			0.1766	0.0277	0.0265		
Org. Carbon	mg/L			6.2	7.5	7.1		
Hardness CaCO3	mg/L			111	47	45		
Total Metals								
Aluminum Al	mg/L		0.1	0.15	0.08	0.25	83%	
Antimony Sb	mg/L			0.0158	0.0032	0.0019	11%	
Arsenic As	mg/L	0.5	0.005	0.00	0.0006	0.0006		
Barium Ba	mg/L			0.0108	0.0033	0.0052		
Beryllium Be	mg/L			0.00061	0.00003	0.00002		
Bismuth Bi	mg/L			0.01523	0.00047	0.00032		
Boron B	mg/L			0.032	0.034	0.030	13%	
Cadmium Cd	mg/L		0.000038	0.000057	0.0000048	0.0000156		
Calcium Ca	mg/L			252	15	11		
Chromium Cr	mg/L		0.001	0.0067	0.001	0.001		81%
Cobalt Co	mg/L			0.0105	0.0011	0.0005		
Copper Cu	mg/L	0.3	0.002	0.010	0.0017	0.0020	87%	
Iron Fe	mg/L		0.3	0.18	0.13	0.28	42%	
Lead Pb	mg/L	0.2	0.002	0.00040	0.00007	0.00026	4%	
Lithium Li	mg/L			0.0049	0.0029	0.0029	90%	
Magnesium Mg	mg/L			9.4	7.4	7.2		
Manganese Mn	mg/L			0.029	0.021	0.024		
Mercury Hg	mg/L		0.0001	0.0000117	0.0000009	0.0000008		1%
Molybdenum Mo	mg/L		0.073	0.0091	0.00041	0.00035		1%
Nickel Ni	mg/L	0.5	0.025	0.008	0.0008	0.0008		3%
Phosphorus P	mg/L			0.256	0.030	0.028		
Potassium K	mg/L			42	3.9	3.3		
Selenium Se	mg/L		0.001	0.00095	0.00090	0.00083		
Silicon SiO2	mg/L			4.0	0.61	0.56		
Silver Ag	mg/L		0.0001	0.00012	0.0000054	0.0000054		5%
Sodium Na	mg/L			178	43	40		
Strontium Sr	mg/L			0.090	0.043	0.046		
Tellurium Te	mg/L			0.050	0.050	0.051		
Thallium Tl	mg/L		0.0008	0.000043	0.000031	0.002001		4%
Thorium Th	mg/L			0.000042	0.0000024	0.0000012		
Tin Sn	mg/L			0.00241	0.00046	0.00004		
Titanium Ti	mg/L			0.0136	0.0062	0.0062		
Uranium U	mg/L			0.000070	0.000040	0.000044		
Vanadium V	mg/L			0.0035	0.0006	0.0005		
Zinc Zn	mg/L	0.5	0.03	0.023	0.0037	0.0054	12%	
Zirconium Zr	mg/L			0.0051	0.0050	0.0051		

Table H-6-A-2
Scenario 6

Water Quality in Little Roberst Lake Outflow

Date		Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter													
TDS	mg/L				152	153	143	163	164				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L				0.00002	0.00000	0.00001	0.00001	0.00001				
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L				0.0000	0.0000	0.0000	0.0000	0.0000				
CNO	mg/L				0.02	0.01	0.01	0.01	0.01				
SCN	mg/L				0.000	0.000	0.000	0.001	0.001				
Sulphate	mg/L				4.1	4.1	5.1	5.0	5.0				
Chloride	mg/L				62	59	59	67	67				
Total Ammonia	mg/L				0.009	0.016	0.004	0.012	0.012				
Nitrate	mg/L				0.03	0.04	0.04	0.05	0.06				
Nitrite	mg/L				0.004	0.005	0.003	0.005	0.005				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0014	0.0015	0.0016	0.0017	0.0018				
Phosphate-P	mg/L				0.0245	0.0165	0.0076	0.0197	0.0198				
Org. Carbon	mg/L				6.0	4.0	7.1	5.1	5.1				
Hardness CaCO3	mg/L				44	39	41	45	45				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0018	0.0012	0.0007	0.0007				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0035	0.0045	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00012	0.00015	0.00016	0.00018	0.00019				
Boron B	mg/L				0.029	0.020	0.028	0.027	0.027				
Cadmium Cd	mg/L				0.0000030	0.0000046	0.0000152	0.0000027	0.0000028				
Calcium Ca	mg/L				9	8	8	9	9				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0002	0.0002				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00026	0.00026				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.1	5.2	7.2	7.2				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00021	0.00020	0.00027	0.00024	0.00025				
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.025	0.017	0.008	0.020	0.021				
Potassium K	mg/L				2.8	2.3	2.3	2.7	2.7				
Selenium Se	mg/L				0.00065	0.00037	0.00083	0.00060	0.00060				
Silicon SiO2	mg/L				0.52	0.52	0.53	0.53	0.53				
Silver Ag	mg/L				0.0000045	0.0000021	0.0000046	0.0000030	0.0000030				
Sodium Na	mg/L				38	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.040	0.046	0.046				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000301	0.000301	0.002001	0.002001				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Titanium Ti	mg/L				0.0060	0.0061	0.0061	0.0061	0.0061				
Uranium U	mg/L				0.000036	0.000033	0.000035	0.000044	0.000044				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0018	0.0016	0.0052	0.0053				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-6-A-2
Scenario 6

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter													
TDS	mg/L				156	156	146	167	167				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L				0.00004	0.00000	0.00001	0.00001	0.00001				
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L				0.0001	0.0000	0.0000	0.0000	0.0000				
CNO	mg/L				0.05	0.00	0.01	0.01	0.01				
SCN	mg/L				0.001	0.001	0.001	0.001	0.001				
Sulphate	mg/L				4.8	4.7	5.7	5.5	5.6				
Chloride	mg/L				65	62	61	69	69				
Total Ammonia	mg/L				0.014	0.023	0.003	0.011	0.011				
Nitrate	mg/L				0.08	0.08	0.08	0.09	0.10				
Nitrite	mg/L				0.009	0.005	0.003	0.003	0.005				
Alkalinity	mg/L				24	24	25	26	26				
OrthoPhosphate-P	mg/L				0.0025	0.0025	0.0024	0.0025	0.0026				
Phosphate-P	mg/L				0.0255	0.0175	0.0085	0.0206	0.0206				
Org. Carbon	mg/L				6.0	4.0	7.1	5.1	5.1				
Hardness CaCO3	mg/L				44	39	41	45	45				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0005	0.0019	0.0013	0.0008	0.0008				
Arsenic As	mg/L				0.0005	0.0004	0.0006	0.0005	0.0005				
Barium Ba	mg/L				0.0052	0.0035	0.0045	0.0043	0.0043				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00022	0.00023	0.00024	0.00025	0.00026				
Boron B	mg/L				0.030	0.020	0.029	0.027	0.027				
Cadmium Cd	mg/L				0.0000035	0.0000050	0.0000156	0.0000031	0.0000031				
Calcium Ca	mg/L				11	9	9	10	11				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0003	0.0004	0.0005	0.0002	0.0002				
Copper Cu	mg/L				0.0013	0.0014	0.0017	0.0020	0.0020				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00010	0.00026	0.00026				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.1	5.1	5.3	7.2	7.2				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00028	0.00027	0.00033	0.00030	0.00031				
Nickel Ni	mg/L				0.0007	0.0006	0.0007	0.0007	0.0007				
Phosphorus P	mg/L				0.027	0.019	0.010	0.022	0.022				
Potassium K	mg/L				3.2	2.6	2.6	2.9	3.0				
Selenium Se	mg/L				0.00065	0.00037	0.00083	0.00060	0.00060				
Silicon SiO2	mg/L				0.55	0.55	0.55	0.55	0.55				
Silver Ag	mg/L				0.0000050	0.0000025	0.0000049	0.0000033	0.0000033				
Sodium Na	mg/L				38	32	34	37	37				
Strontium Sr	mg/L				0.045	0.038	0.040	0.046	0.046				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00002	0.00002	0.00002	0.00002	0.00003				
Titanium Ti	mg/L				0.0061	0.0061	0.0061	0.0061	0.0061				
Uranium U	mg/L				0.000036	0.000033	0.000035	0.000044	0.000044				
Vanadium V	mg/L				0.0005	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0037	0.0019	0.0018	0.0054	0.0054				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-6-A-2
Scenario 6

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter													
TDS	mg/L				159	158	148	168	168				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L				0.00002								
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L				0.0000								
CNO	mg/L				0.03								
SCN	mg/L				0.001	0.001	0.001	0.001	0.001				
Sulphate	mg/L				5.1	5.0	5.9	5.6	5.6				
Chloride	mg/L				67	64	62	71	71				
Total Ammonia	mg/L				0.012	0.016	0.002	0.009	0.009				
Nitrate	mg/L				0.10	0.10	0.09	0.10	0.10				
Nitrite	mg/L				0.008	0.004	0.003	0.003	0.003				
Alkalinity	mg/L				24	24	25	26	26				
OrthoPhosphate-P	mg/L				0.0031	0.0031	0.0030	0.0031	0.0032				
Phosphate-P	mg/L				0.0262	0.0181	0.0091	0.0211	0.0212				
Org. Carbon	mg/L				6.0	4.1	7.1	5.1	5.1				
Hardness CaCO3	mg/L				45	39	41	45	45				
Total Metals													
Aluminum Al	mg/L				0.24	0.12	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0006	0.0019	0.0014	0.0008	0.0008				
Arsenic As	mg/L				0.0005	0.0004	0.0006	0.0005	0.0005				
Barium Ba	mg/L				0.0052	0.0035	0.0045	0.0043	0.0043				
Beryllium Be	mg/L				0.00002	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00028	0.00029	0.00029	0.00030	0.00030				
Boron B	mg/L				0.030	0.020	0.029	0.027	0.027				
Cadmium Cd	mg/L				0.0000036	0.0000051	0.0000156	0.0000031	0.0000031				
Calcium Ca	mg/L				11	10	10	11	11				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0003	0.0004	0.0005	0.0002	0.0002				
Copper Cu	mg/L				0.0013	0.0014	0.0017	0.0020	0.0020				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00010	0.00026	0.00026				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.1	5.1	5.3	7.2	7.2				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00031	0.00028	0.00035	0.00031	0.00031				
Nickel Ni	mg/L				0.0008	0.0006	0.0007	0.0007	0.0007				
Phosphorus P	mg/L				0.028	0.020	0.010	0.023	0.023				
Potassium K	mg/L				3.3	2.7	2.7	3.0	3.0				
Selenium Se	mg/L				0.00065	0.00037	0.00083	0.00060	0.00060				
Silicon SiO2	mg/L				0.56	0.56	0.56	0.56	0.56				
Silver Ag	mg/L				0.0000053	0.0000027	0.0000051	0.0000034	0.0000035				
Sodium Na	mg/L				38	32	34	37	37				
Strontium Sr	mg/L				0.045	0.038	0.040	0.046	0.046				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Titanium Ti	mg/L				0.0061	0.0061	0.0061	0.0061	0.0061				
Uranium U	mg/L				0.000037	0.000033	0.000035	0.000044	0.000044				
Vanadium V	mg/L				0.0005	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0038	0.0020	0.0018	0.0054	0.0054				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-6-A-2
Scenario 6

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter													
TDS	mg/L				159	159	148	168	168				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.001	0.001	0.001	0.001	0.001				
Sulphate	mg/L				4.9	4.8	5.7	5.5	5.5				
Chloride	mg/L				68	64	63	71	71				
Total Ammonia	mg/L				0.007	0.007	0.002	0.009	0.009				
Nitrate	mg/L				0.09	0.09	0.08	0.09	0.09				
Nitrite	mg/L				0.004	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				24	24	25	26	26				
OrthoPhosphate-P	mg/L				0.0035	0.0033	0.0032	0.0032	0.0032				
Phosphate-P	mg/L				0.0265	0.0184	0.0092	0.0212	0.0212				
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1				
Hardness CaCO3	mg/L				44	39	41	45	45				
Total Metals													
Aluminum Al	mg/L				0.24	0.12	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0006	0.0019	0.0014	0.0008	0.0008				
Arsenic As	mg/L				0.0005	0.0004	0.0006	0.0004	0.0004				
Barium Ba	mg/L				0.0052	0.0035	0.0045	0.0043	0.0043				
Beryllium Be	mg/L				0.00002	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00032	0.00031	0.00029	0.00029	0.00029				
Boron B	mg/L				0.030	0.020	0.029	0.027	0.027				
Cadmium Cd	mg/L				0.0000035	0.0000050	0.0000156	0.0000031	0.0000031				
Calcium Ca	mg/L				11	9	9	10	10				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0003	0.0004	0.0005	0.0002	0.0002				
Copper Cu	mg/L				0.0013	0.0014	0.0017	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00010	0.00026	0.00026				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.1	5.1	5.3	7.2	7.2				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00029	0.00026	0.00033	0.00029	0.00029				
Nickel Ni	mg/L				0.0007	0.0006	0.0007	0.0007	0.0007				
Phosphorus P	mg/L				0.028	0.020	0.010	0.022	0.022				
Potassium K	mg/L				3.2	2.6	2.6	2.9	2.9				
Selenium Se	mg/L				0.00065	0.00037	0.00083	0.00060	0.00060				
Silicon SiO2	mg/L				0.55	0.55	0.55	0.55	0.55				
Silver Ag	mg/L				0.0000054	0.0000027	0.0000051	0.0000035	0.0000035				
Sodium Na	mg/L				38	32	34	37	37				
Strontium Sr	mg/L				0.045	0.038	0.040	0.046	0.046				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00004	0.00003	0.00003	0.00003	0.00003				
Titanium Ti	mg/L				0.0061	0.0061	0.0061	0.0061	0.0061				
Uranium U	mg/L				0.000037	0.000033	0.000035	0.000044	0.000044				
Vanadium V	mg/L				0.0005	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0038	0.0019	0.0018	0.0054	0.0054				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-6-A-2
Scenario 6

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter													
TDS	mg/L				158	157	147	167	167				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.001	0.001	0.001	0.001	0.001				
Sulphate	mg/L				4.8	4.6	5.5	5.3	5.3				
Chloride	mg/L				67	63	62	70	70				
Total Ammonia	mg/L				0.007	0.007	0.002	0.009	0.009				
Nitrate	mg/L				0.08	0.08	0.07	0.07	0.07				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				24	24	25	26	26				
OrthoPhosphate-P	mg/L				0.0031	0.0030	0.0028	0.0028	0.0028				
Phosphate-P	mg/L				0.0261	0.0180	0.0089	0.0209	0.0209				
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1				
Hardness CaCO3	mg/L				44	39	41	45	45				
Total Metals													
Aluminum Al	mg/L				0.24	0.12	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0006	0.0019	0.0013	0.0008	0.0008				
Arsenic As	mg/L				0.0005	0.0004	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0052	0.0035	0.0045	0.0043	0.0043				
Beryllium Be	mg/L				0.00002	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00029	0.00027	0.00026	0.00026	0.00026				
Boron B	mg/L				0.030	0.020	0.029	0.027	0.027				
Cadmium Cd	mg/L				0.0000035	0.0000050	0.0000155	0.0000030	0.0000030				
Calcium Ca	mg/L				10	9	9	10	10				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0003	0.0004	0.0005	0.0002	0.0002				
Copper Cu	mg/L				0.0012	0.0014	0.0017	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00010	0.00026	0.00026				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.1	5.1	5.3	7.2	7.2				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00027	0.00025	0.00031	0.00027	0.00027				
Nickel Ni	mg/L				0.0007	0.0006	0.0007	0.0007	0.0007				
Phosphorus P	mg/L				0.027	0.019	0.010	0.022	0.022				
Potassium K	mg/L				3.1	2.6	2.5	2.8	2.8				
Selenium Se	mg/L				0.00065	0.00037	0.00083	0.00060	0.00060				
Silicon SiO2	mg/L				0.55	0.55	0.54	0.54	0.54				
Silver Ag	mg/L				0.0000054	0.0000027	0.0000051	0.0000034	0.0000034				
Sodium Na	mg/L				38	32	34	37	37				
Strontium Sr	mg/L				0.045	0.038	0.040	0.046	0.046				
Tellurium Te	mg/L				0.050	0.051	0.051	0.051	0.051				
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Titanium Ti	mg/L				0.0061	0.0061	0.0061	0.0061	0.0061				
Uranium U	mg/L				0.000037	0.000033	0.000035	0.000044	0.000044				
Vanadium V	mg/L				0.0005	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0037	0.0019	0.0018	0.0053	0.0053				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-6-A-2
Scenario 6

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter													
TDS	mg/L				157	157	146	166	166				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.001	0.001	0.001	0.001	0.001				
Sulphate	mg/L				4.6	4.5	5.4	5.2	5.2				
Chloride	mg/L				66	63	61	69	69				
Total Ammonia	mg/L				0.005	0.005	0.000	0.007	0.007				
Nitrate	mg/L				0.05	0.05	0.05	0.05	0.05				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				24	24	25	26	26				
OrthoPhosphate-P	mg/L				0.0028	0.0027	0.0026	0.0026	0.0026				
Phosphate-P	mg/L				0.0258	0.0177	0.0086	0.0206	0.0206				
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1				
Hardness CaCO3	mg/L				44	39	41	45	45				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0006	0.0019	0.0013	0.0008	0.0008				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0052	0.0035	0.0045	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00026	0.00025	0.00024	0.00024	0.00024				
Boron B	mg/L				0.030	0.020	0.028	0.027	0.027				
Cadmium Cd	mg/L				0.0000030	0.0000045	0.0000151	0.0000026	0.0000026				
Calcium Ca	mg/L				10	9	9	9	9				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0004	0.0004	0.0002	0.0002				
Copper Cu	mg/L				0.0012	0.0014	0.0017	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00026	0.00026				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.1	5.1	5.3	7.2	7.2				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00026	0.00023	0.00030	0.00026	0.00026				
Nickel Ni	mg/L				0.0007	0.0006	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.027	0.019	0.009	0.021	0.021				
Potassium K	mg/L				3.0	2.5	2.5	2.8	2.8				
Selenium Se	mg/L				0.00065	0.00037	0.00083	0.00060	0.00060				
Silicon SiO2	mg/L				0.54	0.54	0.54	0.54	0.54				
Silver Ag	mg/L				0.0000048	0.0000022	0.0000045	0.0000029	0.0000029				
Sodium Na	mg/L				38	31	34	36	36				
Strontium Sr	mg/L				0.045	0.038	0.040	0.046	0.046				
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051				
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001				
Thorium Th	mg/L				0.000000	0.000000	0.000000	0.000000	0.000000				
Tin Sn	mg/L				0.00003	0.00002	0.00002	0.00002	0.00002				
Titanium Ti	mg/L				0.0061	0.0061	0.0061	0.0061	0.0061				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0005	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0037	0.0019	0.0017	0.0053	0.0053				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-6-A-2
Scenario 6

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter													
TDS	mg/L				156	156	146	166	166				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.001	0.001	0.001	0.001	0.001				
Sulphate	mg/L				4.5	4.4	5.3	5.1	5.1				
Chloride	mg/L				65	62	61	69	69				
Total Ammonia	mg/L				0.005	0.005	0.000	0.007	0.007				
Nitrate	mg/L				0.04	0.04	0.03	0.04	0.04				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				24	24	25	26	26				
OrthoPhosphate-P	mg/L				0.0025	0.0024	0.0023	0.0023	0.0023				
Phosphate-P	mg/L				0.0256	0.0175	0.0084	0.0204	0.0204				
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1				
Hardness CaCO3	mg/L				44	39	41	45	45				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0006	0.0018	0.0013	0.0007	0.0007				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0052	0.0035	0.0045	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00023	0.00022	0.00022	0.00022	0.00022				
Boron B	mg/L				0.030	0.020	0.028	0.027	0.027				
Cadmium Cd	mg/L				0.0000030	0.0000045	0.0000150	0.0000025	0.0000025				
Calcium Ca	mg/L				10	8	8	9	9				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0004	0.0004	0.0002	0.0002				
Copper Cu	mg/L				0.0012	0.0014	0.0017	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg	mg/L				7.1	5.1	5.3	7.2	7.2				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00024	0.00022	0.00029	0.00025	0.00025				
Nickel Ni	mg/L				0.0007	0.0006	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.026	0.018	0.009	0.021	0.021				
Potassium K	mg/L				3.0	2.5	2.4	2.7	2.7				
Selenium Se	mg/L				0.00065	0.00037	0.00083	0.00060	0.00060				
Silicon SiO2	mg/L				0.54	0.53	0.53	0.53	0.53				
Silver Ag	mg/L				0.0000048	0.0000021	0.0000045	0.0000028	0.0000028				
Sodium Na	mg/L				38	31	34	36	36				
Strontium Sr	mg/L				0.045	0.038	0.040	0.046	0.046				
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051				
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001				
Thorium Th	mg/L				0.000000	0.000000	0.000000	0.000000	0.000000				
Tin Sn	mg/L				0.00002	0.00002	0.00002	0.00002	0.00002				
Titanium Ti	mg/L				0.0061	0.0061	0.0061	0.0061	0.0061				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0005	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0036	0.0018	0.0017	0.0053	0.0053				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-6-A-2
Scenario 6

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter													
TDS	mg/L				155	155	145	165	165				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.001	0.001	0.001	0.001	0.001				
Sulphate	mg/L				4.4	4.3	5.2	5.0	5.0				
Chloride	mg/L				65	61	60	68	68				
Total Ammonia	mg/L				0.005	0.005	0.000	0.007	0.007				
Nitrate	mg/L				0.03	0.03	0.02	0.03	0.03				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				24	24	25	26	26				
OrthoPhosphate-P	mg/L				0.0023	0.0022	0.0022	0.0022	0.0021				
Phosphate-P	mg/L				0.0254	0.0173	0.0082	0.0202	0.0202				
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1				
Hardness CaCO3	mg/L				44	39	41	45	45				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0005	0.0018	0.0013	0.0007	0.0007				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0052	0.0035	0.0045	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00021	0.00021	0.00020	0.00020	0.00020				
Boron B	mg/L				0.030	0.020	0.028	0.027	0.027				
Cadmium Cd	mg/L				0.0000029	0.0000044	0.0000149	0.0000024	0.0000024				
Calcium Ca	mg/L				9	8	8	9	9				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0004	0.0004	0.0002	0.0002				
Copper Cu	mg/L				0.0012	0.0014	0.0017	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0029	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.1	5.1	5.3	7.2	7.2				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00023	0.00022	0.00028	0.00024	0.00024				
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.026	0.018	0.009	0.021	0.021				
Potassium K	mg/L				3.0	2.4	2.4	2.7	2.7				
Selenium Se	mg/L				0.00065	0.00037	0.00083	0.00060	0.00060				
Silicon SiO2	mg/L				0.53	0.53	0.53	0.53	0.53				
Silver Ag	mg/L				0.0000047	0.0000021	0.0000044	0.0000028	0.0000028				
Sodium Na	mg/L				38	31	34	36	36				
Strontium Sr	mg/L				0.045	0.038	0.040	0.046	0.046				
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051				
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001				
Thorium Th	mg/L				0.000000	0.000000	0.000000	0.000000	0.000000				
Tin Sn	mg/L				0.00002	0.00002	0.00002	0.00002	0.00002				
Titanium Ti	mg/L				0.0061	0.0061	0.0061	0.0061	0.0061				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0005	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0036	0.0018	0.0017	0.0052	0.0052				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-6-A-2
Scenario 6

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter													
TDS	mg/L				155	155	145	165	165				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L				0.001	0.000	0.000	0.000	0.000				
Sulphate	mg/L				4.3	4.2	5.1	4.9	4.9				
Chloride	mg/L				64	61	60	68	68				
Total Ammonia	mg/L				0.005	0.005	0.000	0.007	0.007				
Nitrate	mg/L				0.02	0.02	0.01	0.02	0.02				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				24	24	25	26	26				
OrthoPhosphate-P	mg/L				0.0021	0.0021	0.0020	0.0020	0.0020				
Phosphate-P	mg/L				0.0252	0.0171	0.0081	0.0201	0.0201				
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1				
Hardness CaCO3	mg/L				44	39	41	45	45				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0005	0.0018	0.0013	0.0007	0.0007				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0052	0.0035	0.0045	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00020	0.00019	0.00019	0.00019	0.00019				
Boron B	mg/L				0.030	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000028	0.0000043	0.0000149	0.0000024	0.0000024				
Calcium Ca	mg/L				9	8	8	9	9				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0004	0.0004	0.0002	0.0002				
Copper Cu	mg/L				0.0012	0.0014	0.0017	0.0019	0.0019				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.1	5.1	5.3	7.2	7.2				
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00023	0.00021	0.00028	0.00024	0.00024				
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.026	0.018	0.009	0.021	0.021				
Potassium K	mg/L				2.9	2.4	2.4	2.7	2.7				
Selenium Se	mg/L				0.00065	0.00037	0.00083	0.00060	0.00060				
Silicon SiO2	mg/L				0.53	0.53	0.53	0.53	0.53				
Silver Ag	mg/L				0.0000047	0.0000020	0.0000044	0.0000027	0.0000027				
Sodium Na	mg/L				38	31	34	36	36				
Strontium Sr	mg/L				0.045	0.038	0.040	0.046	0.046				
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051				
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001				
Thorium Th	mg/L				0.000000	0.000000	0.000000	0.000000	0.000000				
Tin Sn	mg/L				0.00002	0.00002	0.00002	0.00002	0.00002				
Titanium Ti	mg/L				0.0061	0.0061	0.0061	0.0061	0.0061				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0036	0.0018	0.0017	0.0052	0.0052				
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051				

Table H-6-A-2
Scenario 6

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16
Parameter												
TDS	mg/L				154	156	147	168	169			
TSS	mg/L				7.0	8.0	4.0	5.0	5.0			
Free CN	mg/L											
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002			
WAD CN	mg/L											
CNO	mg/L											
SCN	mg/L				0.000	0.000	0.000	0.000	0.000			
Sulphate	mg/L				4.2	4.1	5.1	4.9	4.9			
Chloride	mg/L				64	62	61	70	71			
Total Ammonia	mg/L				0.005	0.005	0.000	0.007	0.007			
Nitrate	mg/L				0.01	0.01	0.01	0.01	0.01			
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002			
Alkalinity	mg/L				24	24	25	26	26			
OrthoPhosphate-P	mg/L				0.0020	0.0019	0.0019	0.0019	0.0019			
Phosphate-P	mg/L				0.0250	0.0170	0.0079	0.0199	0.0199			
Org. Carbon	mg/L				6.1	4.1	7.1	5.1	5.1			
Hardness CaCO3	mg/L				44	39	41	45	45			
Total Metals												
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15			
Antimony Sb	mg/L				0.0005	0.0018	0.0012	0.0007	0.0007			
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004			
Barium Ba	mg/L				0.0051	0.0035	0.0045	0.0042	0.0042			
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001			
Bismuth Bi	mg/L				0.00018	0.00018	0.00017	0.00017	0.00017			
Boron B	mg/L				0.029	0.020	0.028	0.027	0.027			
Cadmium Cd	mg/L				0.0000028	0.0000043	0.0000148	0.0000023	0.0000023			
Calcium Ca	mg/L				9	8	8	9	9			
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000			
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0002	0.0002			
Copper Cu	mg/L				0.0012	0.0014	0.0016	0.0019	0.0019			
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16			
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025			
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0029			
Magnesium Mg	mg/L				7.0	5.1	5.3	7.2	7.2			
Manganese Mn	mg/L				0.024	0.009	0.013	0.008	0.008			
Mercury Hg	mg/L				0.0000006	0.0000007	0.0000007	0.0000007	0.0000007			
Molybdenum Mo	mg/L				0.00022	0.00020	0.00027	0.00023	0.00023			
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006			
Phosphorus P	mg/L				0.025	0.017	0.008	0.020	0.020			
Potassium K	mg/L				2.9	2.4	2.3	2.6	2.6			
Selenium Se	mg/L				0.00065	0.00037	0.00083	0.00060	0.00060			
Silicon SiO2	mg/L				0.53	0.53	0.53	0.53	0.53			
Silver Ag	mg/L				0.0000046	0.0000020	0.0000043	0.0000027	0.0000027			
Sodium Na	mg/L				38	32	35	38	38			
Strontium Sr	mg/L				0.045	0.038	0.040	0.046	0.046			
Tellurium Te	mg/L				0.051	0.051	0.051	0.051	0.051			
Thallium Tl	mg/L				0.000101	0.000301	0.000301	0.002001	0.002001			
Thorium Th	mg/L				0.000000	0.000000	0.000000	0.000000	0.000000			
Tin Sn	mg/L				0.00002	0.00001	0.00001	0.00001	0.00001			
Titanium Ti	mg/L				0.0061	0.0061	0.0061	0.0061	0.0061			
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043			
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003			
Zinc Zn	mg/L				0.0036	0.0018	0.0016	0.0052	0.0052			
Zirconium Zr	mg/L				0.0051	0.0051	0.0051	0.0051	0.0051			

Table H 6-A-3
Scenario 6

Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter												
TDS				140	123	127	148	149				
TSS				3.9	5.8	5.9	6.9	6.9				
Free CN				0.00004	0.00001	0.00001	0.00001	0.00001				
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN				0.0001	0.0000	0.0000	0.0000	0.0000				
CNO				0.04	0.01	0.01	0.01	0.01				
SCN				0.001	0.001	0.001	0.001	0.001				
Sulphate				3.3	3.4	3.6	3.9	4.1				
Chloride				61	62	60	65	65				
Total Ammonia				0.014	0.029	0.022	0.022	0.023				
Nitrate				0.05	0.07	0.09	0.10	0.11				
Nitrite				0.007	0.009	0.008	0.008	0.008				
Alkalinity				27	25	27	27	27				
OrthoPhosphate-P				0.0015	0.0017	0.0018	0.0021	0.0023				
Phosphate-P				0.0169	0.0185	0.0245	0.0204	0.0206				
Org. Carbon				5.4	5.1	7.4	5.0	5.0				
Hardness CaCO3				45	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0009	0.0029	0.0006	0.0006				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0032				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00002				
Bismuth Bi				0.00008	0.00013	0.00016	0.00018	0.00020				
Boron B				0.034	0.022	0.023	0.022	0.022				
Cadmium Cd				0.0000035	0.0000037	0.0000033	0.0000034	0.0000035				
Calcium Ca				10	10	10	10	10				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0001	0.0002	0.0010	0.0002	0.0002				
Copper Cu				0.0012	0.0016	0.0013	0.0016	0.0016				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00002	0.00007	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.2	6.5	6.6	6.4	6.5				
Manganese Mn				0.007	0.020	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00021	0.00022	0.00025	0.00025	0.00026				
Nickel Ni				0.0004	0.0006	0.0005	0.0005	0.0005				
Phosphorus P				0.018	0.020	0.026	0.022	0.022				
Potassium K				3.0	2.7	2.7	2.7	2.8				
Selenium Se				0.00088	0.00057	0.00061	0.00055	0.00055				
Silicon SiO2				0.53	0.53	0.54	0.54	0.55				
Silver Ag				0.0000035	0.0000042	0.0000040	0.0000041	0.0000042				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.040	0.042	0.036	0.040	0.040				
Tellurium Te				0.049	0.049	0.049	0.049	0.049				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000016	0.0000018	0.0000019	0.0000020	0.0000020				
Tin Sn				0.00040	0.00041	0.00041	0.00042	0.00042				
Titanium Ti				0.0059	0.0059	0.0059	0.0059	0.0059				
Uranium U				0.000026	0.000032	0.000039	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0010	0.0033	0.0030	0.0019	0.0020				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 6-A-3
Scenario 6

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter												
TDS				149	130	134	154	155				
TSS				4.0	5.8	5.9	6.9	6.9				
Free CN				0.00009	0.00000	0.00001	0.00001	0.00001				
Total CN				0.003	0.002	0.002	0.002	0.002				
WAD CN				0.0001	0.0000	0.0000	0.0000	0.0000				
CNO				0.09	0.00	0.01	0.01	0.01				
SCN				0.002	0.002	0.002	0.002	0.002				
Sulphate				4.8	4.7	4.8	5.1	5.2				
Chloride				66	67	65	69	69				
Total Ammonia				0.024	0.044	0.019	0.021	0.021				
Nitrate				0.15	0.16	0.16	0.18	0.19				
Nitrite				0.016	0.008	0.008	0.004	0.008				
Alkalinity				28	26	28	27	27				
OrthoPhosphate-P				0.0037	0.0036	0.0036	0.0037	0.0039				
Phosphate-P				0.0191	0.0203	0.0262	0.0221	0.0222				
Org. Carbon				5.4	5.1	7.4	5.0	5.0				
Hardness CaCO3				47	44	44	45	46				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0006	0.0011	0.0031	0.0008	0.0008				
Arsenic As				0.0005	0.0005	0.0004	0.0004	0.0004				
Barium Ba				0.0030	0.0033	0.0032	0.0033	0.0033				
Beryllium Be				0.00002	0.00002	0.00002	0.00002	0.00002				
Bismuth Bi				0.00027	0.00029	0.00030	0.00032	0.00034				
Boron B				0.034	0.023	0.023	0.023	0.023				
Cadmium Cd				0.0000045	0.0000045	0.0000040	0.0000041	0.0000042				
Calcium Ca				14	13	13	13	13				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0003	0.0004	0.0011	0.0003	0.0003				
Copper Cu				0.0014	0.0017	0.0014	0.0017	0.0017				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00003	0.00007	0.00005	0.00005	0.00005				
Lithium Li				0.0028	0.0028	0.0028	0.0029	0.0029				
Magnesium Mg				7.3	6.6	6.7	6.5	6.5				
Manganese Mn				0.007	0.021	0.014	0.011	0.011				
Mercury Hg				0.0000008	0.0000008	0.0000008	0.0000008	0.0000008				
Molybdenum Mo				0.00036	0.00035	0.00037	0.00037	0.00038				
Nickel Ni				0.0006	0.0007	0.0006	0.0006	0.0006				
Phosphorus P				0.021	0.023	0.029	0.025	0.025				
Potassium K				3.7	3.3	3.3	3.2	3.3				
Selenium Se				0.00089	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.59	0.59	0.58	0.59	0.59				
Silver Ag				0.0000044	0.0000049	0.0000046	0.0000047	0.0000048				
Sodium Na				39	33	35	32	32				
Strontium Sr				0.042	0.043	0.037	0.041	0.041				
Tellurium Te				0.049	0.049	0.049	0.049	0.049				
Thallium Tl				0.000030	0.000031	0.000031	0.000031	0.000031				
Thorium Th				0.0000020	0.0000021	0.0000022	0.0000022	0.0000023				
Tin Sn				0.00043	0.00043	0.00044	0.00044	0.00044				
Titanium Ti				0.0059	0.0059	0.0059	0.0060	0.0060				
Uranium U				0.000027	0.000032	0.000040	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0014	0.0036	0.0033	0.0022	0.0022				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 6-A-3
Scenario 6

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter												
TDS				153	134	137	157	157				
TSS				4.0	5.8	5.9	6.9	6.9				
Free CN				0.00005								
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN				0.0001								
CNO				0.05								
SCN				0.003	0.003	0.002	0.002	0.002				
Sulphate				5.4	5.2	5.1	5.3	5.3				
Chloride				70	70	68	72	72				
Total Ammonia				0.018	0.029	0.017	0.016	0.016				
Nitrate				0.19	0.19	0.19	0.19	0.19				
Nitrite				0.013	0.007	0.007	0.003	0.003				
Alkalinity				28	26	28	27	27				
OrthoPhosphate-P				0.0050	0.0048	0.0047	0.0049	0.0050				
Phosphate-P				0.0203	0.0216	0.0274	0.0232	0.0233				
Org. Carbon				5.4	5.1	7.4	5.0	5.0				
Hardness CaCO3				47	44	44	46	46				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0007	0.0012	0.0032	0.0009	0.0009				
Arsenic As				0.0006	0.0005	0.0004	0.0004	0.0004				
Barium Ba				0.0031	0.0033	0.0032	0.0033	0.0033				
Beryllium Be				0.00002	0.00002	0.00002	0.00002	0.00002				
Bismuth Bi				0.00039	0.00040	0.00040	0.00042	0.00044				
Boron B				0.034	0.023	0.023	0.023	0.023				
Cadmium Cd				0.0000048	0.0000048	0.0000042	0.0000042	0.0000042				
Calcium Ca				15	14	14	13	13				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0003	0.0004	0.0011	0.0003	0.0003				
Copper Cu				0.0014	0.0017	0.0015	0.0017	0.0017				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00003	0.00007	0.00005	0.00005	0.00005				
Lithium Li				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg				7.4	6.6	6.7	6.5	6.6				
Manganese Mn				0.007	0.021	0.014	0.011	0.011				
Mercury Hg				0.0000008	0.0000008	0.0000008	0.0000008	0.0000008				
Molybdenum Mo				0.00041	0.00039	0.00040	0.00038	0.00038				
Nickel Ni				0.0006	0.0008	0.0007	0.0006	0.0006				
Phosphorus P				0.023	0.024	0.030	0.026	0.026				
Potassium K				3.9	3.5	3.4	3.3	3.3				
Selenium Se				0.00089	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.61	0.60	0.60	0.60	0.60				
Silver Ag				0.0000049	0.0000053	0.0000049	0.0000050	0.0000050				
Sodium Na				40	33	35	32	32				
Strontium Sr				0.042	0.043	0.037	0.041	0.041				
Tellurium Te				0.049	0.049	0.049	0.049	0.049				
Thallium Tl				0.000031	0.000031	0.000031	0.000031	0.000031				
Thorium Th				0.0000022	0.0000022	0.0000022	0.0000023	0.0000023				
Tin Sn				0.00045	0.00045	0.00045	0.00045	0.00046				
Titanium Ti				0.0059	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000027	0.000032	0.000040	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0015	0.0037	0.0034	0.0022	0.0022				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 6-A-3
Scenario 6

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter												
TDS				154	135	137	157	157				
TSS				4.0	5.8	5.9	6.9	6.9				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.002	0.002	0.002	0.002	0.002				
Sulphate				5.1	4.8	4.8	5.0	4.9				
Chloride				72	71	68	72	72				
Total Ammonia				0.009	0.011	0.017	0.016	0.016				
Nitrate				0.18	0.17	0.17	0.17	0.17				
Nitrite				0.005	0.003	0.003	0.003	0.003				
Alkalinity				28	26	28	27	27				
OrthoPhosphate-P				0.0057	0.0054	0.0051	0.0051	0.0050				
Phosphate-P				0.0211	0.0221	0.0277	0.0234	0.0234				
Org. Carbon				5.4	5.1	7.4	5.0	5.0				
Hardness CaCO3				47	44	44	45	45				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0008	0.0012	0.0032	0.0008	0.0008				
Arsenic As				0.0005	0.0005	0.0004	0.0004	0.0004				
Barium Ba				0.0030	0.0033	0.0031	0.0032	0.0032				
Beryllium Be				0.00003	0.00002	0.00002	0.00002	0.00002				
Bismuth Bi				0.00047	0.00044	0.00041	0.00041	0.00041				
Boron B				0.034	0.023	0.023	0.023	0.023				
Cadmium Cd				0.0000046	0.0000046	0.0000040	0.0000040	0.0000041				
Calcium Ca				14	13	13	12	12				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0003	0.0004	0.0011	0.0003	0.0003				
Copper Cu				0.0014	0.0017	0.0014	0.0017	0.0017				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00003	0.00007	0.00005	0.00005	0.00005				
Lithium Li				0.0029	0.0029	0.0029	0.0029	0.0029				
Magnesium Mg				7.3	6.6	6.7	6.5	6.5				
Manganese Mn				0.007	0.021	0.014	0.010	0.010				
Mercury Hg				0.0000008	0.0000008	0.0000008	0.0000008	0.0000008				
Molybdenum Mo				0.00036	0.00034	0.00036	0.00034	0.00034				
Nickel Ni				0.0006	0.0008	0.0006	0.0006	0.0006				
Phosphorus P				0.024	0.025	0.030	0.026	0.026				
Potassium K				3.7	3.3	3.2	3.1	3.1				
Selenium Se				0.00089	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.59	0.59	0.58	0.58	0.58				
Silver Ag				0.0000051	0.0000054	0.0000050	0.0000050	0.0000050				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.042	0.043	0.037	0.041	0.041				
Tellurium Te				0.049	0.049	0.049	0.050	0.050				
Thallium Tl				0.000031	0.000031	0.000031	0.000031	0.000031				
Thorium Th				0.0000023	0.0000023	0.0000023	0.0000023	0.0000024				
Tin Sn				0.00046	0.00046	0.00045	0.00045	0.00045				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000027	0.000032	0.000040	0.000034	0.000034				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0015	0.0036	0.0033	0.0022	0.0022				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 6-A-3
Scenario 6

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter												
TDS				151	133	135	155	155				
TSS				4.0	5.8	5.9	6.9	6.9				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.002	0.002	0.002	0.002	0.002				
Sulphate				4.7	4.5	4.5	4.6	4.6				
Chloride				70	69	67	71	71				
Total Ammonia				0.008	0.011	0.017	0.016	0.016				
Nitrate				0.15	0.15	0.14	0.14	0.14				
Nitrite				0.003	0.003	0.003	0.003	0.003				
Alkalinity				28	26	27	27	27				
OrthoPhosphate-P				0.0049	0.0046	0.0044	0.0044	0.0044				
Phosphate-P				0.0203	0.0214	0.0271	0.0227	0.0227				
Org. Carbon				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3				47	44	44	45	45				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0007	0.0012	0.0031	0.0008	0.0008				
Arsenic As				0.0005	0.0005	0.0004	0.0004	0.0004				
Barium Ba				0.0030	0.0033	0.0031	0.0032	0.0032				
Beryllium Be				0.00002	0.00002	0.00002	0.00002	0.00002				
Bismuth Bi				0.00040	0.00038	0.00035	0.00035	0.00035				
Boron B				0.034	0.023	0.023	0.023	0.023				
Cadmium Cd				0.0000045	0.0000045	0.0000039	0.0000039	0.0000039				
Calcium Ca				13	12	12	11	11				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0003	0.0003	0.0010	0.0003	0.0003				
Copper Cu				0.0014	0.0017	0.0014	0.0016	0.0016				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00003	0.00007	0.00005	0.00005	0.00005				
Lithium Li				0.0029	0.0029	0.0028	0.0029	0.0029				
Magnesium Mg				7.3	6.6	6.7	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000008	0.0000008	0.0000008	0.0000008	0.0000008				
Molybdenum Mo				0.00033	0.00031	0.00033	0.00031	0.00031				
Nickel Ni				0.0006	0.0007	0.0006	0.0006	0.0006				
Phosphorus P				0.023	0.024	0.029	0.025	0.025				
Potassium K				3.6	3.1	3.1	3.0	3.0				
Selenium Se				0.00089	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.58	0.58	0.57	0.57	0.57				
Silver Ag				0.0000051	0.0000054	0.0000050	0.0000050	0.0000050				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.043	0.037	0.041	0.041				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000031	0.000031	0.000031	0.000031	0.000031				
Thorium Th				0.0000023	0.0000024	0.0000024	0.0000024	0.0000024				
Tin Sn				0.00045	0.00045	0.00044	0.00044	0.00044				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000027	0.000032	0.000040	0.000034	0.000034				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0014	0.0035	0.0032	0.0021	0.0021				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 6-A-3
Scenario 6

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter												
TDS				150	131	134	153	153				
TSS				4.0	5.8	5.9	6.9	6.9				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.002	0.002	0.001	0.001	0.001				
Sulphate				4.4	4.2	4.2	4.4	4.4				
Chloride				68	68	65	69	69				
Total Ammonia				0.005	0.008	0.014	0.013	0.013				
Nitrate				0.10	0.10	0.10	0.10	0.10				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				28	26	27	27	27				
OrthoPhosphate-P				0.0043	0.0040	0.0038	0.0038	0.0038				
Phosphate-P				0.0197	0.0208	0.0265	0.0222	0.0222				
Org. Carbon				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3				46	44	43	45	45				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0007	0.0011	0.0030	0.0007	0.0007				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0030	0.0033	0.0031	0.0032	0.0032				
Beryllium Be				0.00002	0.00002	0.00002	0.00002	0.00002				
Bismuth Bi				0.00034	0.00032	0.00030	0.00030	0.00030				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000036	0.0000036	0.0000030	0.0000030	0.0000031				
Calcium Ca				12	12	11	11	11				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0002	0.0003	0.0010	0.0002	0.0002				
Copper Cu				0.0013	0.0016	0.0014	0.0016	0.0016				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00003	0.00007	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00030	0.00029	0.00031	0.00029	0.00029				
Nickel Ni				0.0005	0.0007	0.0006	0.0006	0.0006				
Phosphorus P				0.021	0.022	0.028	0.024	0.024				
Potassium K				3.4	3.0	3.0	2.9	2.9				
Selenium Se				0.00089	0.00057	0.00061	0.00055	0.00055				
Silicon SiO2				0.56	0.56	0.56	0.56	0.56				
Silver Ag				0.0000040	0.0000043	0.0000039	0.0000039	0.0000039				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.043	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000008	0.0000008	0.0000008	0.0000008	0.0000008				
Tin Sn				0.00044	0.00044	0.00043	0.00043	0.00043				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000031	0.000039	0.000032	0.000032				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0013	0.0035	0.0031	0.0020	0.0020				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 6-A-3
Scenario 6

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter												
TDS				148	129	132	152	152				
TSS				4.0	5.8	5.9	6.9	6.9				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.001	0.001	0.001	0.001	0.001				
Sulphate				4.1	4.0	4.0	4.2	4.2				
Chloride				67	67	64	68	68				
Total Ammonia				0.005	0.008	0.014	0.013	0.013				
Nitrate				0.08	0.08	0.07	0.07	0.07				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				28	26	27	27	27				
OrthoPhosphate-P				0.0037	0.0036	0.0034	0.0034	0.0034				
Phosphate-P				0.0191	0.0203	0.0261	0.0217	0.0217				
Org. Carbon				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3				46	44	43	45	45				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0006	0.0011	0.0030	0.0007	0.0007				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0031	0.0032	0.0032				
Beryllium Be				0.00002	0.00002	0.00002	0.00002	0.00002				
Bismuth Bi				0.00029	0.00028	0.00026	0.00026	0.00026				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000035	0.0000035	0.0000029	0.0000029	0.0000029				
Calcium Ca				12	11	11	10	10				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0002	0.0003	0.0010	0.0002	0.0002				
Copper Cu				0.0013	0.0016	0.0014	0.0016	0.0016				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00003	0.00007	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00028	0.00027	0.00029	0.00027	0.00027				
Nickel Ni				0.0005	0.0007	0.0006	0.0005	0.0005				
Phosphorus P				0.021	0.022	0.027	0.023	0.023				
Potassium K				3.3	2.9	2.9	2.8	2.8				
Selenium Se				0.00089	0.00057	0.00061	0.00055	0.00055				
Silicon SiO2				0.56	0.55	0.55	0.55	0.55				
Silver Ag				0.0000040	0.0000042	0.0000038	0.0000038	0.0000038				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000008	0.0000008	0.0000007	0.0000007	0.0000007				
Tin Sn				0.00043	0.00043	0.00043	0.00043	0.00043				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000031	0.000038	0.000032	0.000032				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0012	0.0034	0.0031	0.0020	0.0020				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 6-A-3
Scenario 6

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter												
TDS				147	128	131	151	151				
TSS				4.0	5.8	5.9	6.9	6.9				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.001	0.001	0.001	0.001	0.001				
Sulphate				3.9	3.8	3.9	4.0	4.0				
Chloride				66	66	63	67	67				
Total Ammonia				0.005	0.008	0.014	0.013	0.013				
Nitrate				0.06	0.05	0.05	0.05	0.05				
Nitrite				0.0019	0.0019	0.002	0.002	0.002				
Alkalinity				28	26	27	27	27				
OrthoPhosphate-P				0.0033	0.0032	0.0030	0.0030	0.0030				
Phosphate-P				0.0187	0.0199	0.0257	0.0213	0.0213				
Org. Carbon				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3				46	43	43	45	45				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0006	0.0010	0.0030	0.0007	0.0007				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0031	0.0032	0.0032				
Beryllium Be				0.00002	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00025	0.00024	0.00023	0.00023	0.00023				
Boron B				0.034	0.022	0.023	0.022	0.022				
Cadmium Cd				0.0000034	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca				11	10	10	10	10				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0002	0.0003	0.0010	0.0002	0.0002				
Copper Cu				0.0013	0.0016	0.0013	0.0016	0.0016				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00002	0.00007	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00026	0.00025	0.00027	0.00025	0.00025				
Nickel Ni				0.0005	0.0007	0.0006	0.0005	0.0005				
Phosphorus P				0.020	0.021	0.027	0.022	0.022				
Potassium K				3.3	2.8	2.8	2.7	2.7				
Selenium Se				0.00088	0.00057	0.00061	0.00055	0.00055				
Silicon SiO2				0.55	0.55	0.55	0.55	0.55				
Silver Ag				0.0000039	0.0000041	0.0000037	0.0000037	0.0000037				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000007	0.0000007	0.0000006	0.0000006	0.0000006				
Tin Sn				0.00043	0.00043	0.00042	0.00042	0.00042				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000031	0.000038	0.000032	0.000032				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0012	0.0034	0.0030	0.0019	0.0019				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 6-A-3
Scenario 6

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

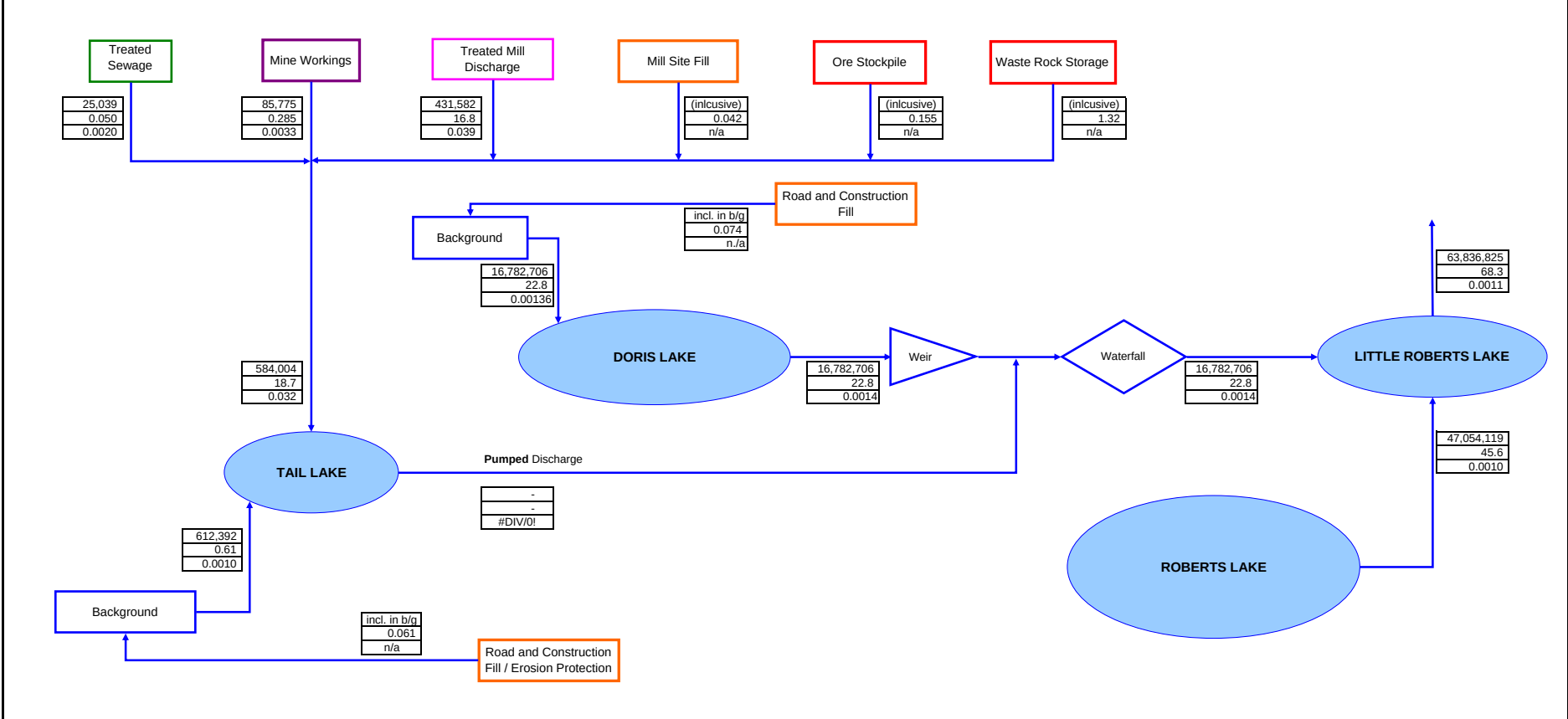
Date	Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter												
TDS				146	127	130	150	150				
TSS				4.0	5.8	5.9	6.9	6.9				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.001	0.001	0.001	0.001	0.001				
Sulphate				3.8	3.6	3.7	3.8	3.8				
Chloride				65	65	63	66	66				
Total Ammonia				0.005	0.008	0.014	0.013	0.013				
Nitrate				0.04	0.04	0.03	0.03	0.03				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				28	26	27	27	27				
OrthoPhosphate-P				0.0029	0.0028	0.0027	0.0027	0.0027				
Phosphate-P				0.0184	0.0196	0.0254	0.0210	0.0210				
Org. Carbon				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0006	0.0010	0.0029	0.0006	0.0006				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00002	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00022	0.00021	0.00020	0.00020	0.00020				
Boron B				0.034	0.022	0.023	0.022	0.022				
Cadmium Cd				0.0000032	0.0000032	0.0000027	0.0000027	0.0000027				
Calcium Ca				11	10	10	9	9				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0002	0.0002	0.0010	0.0002	0.0002				
Copper Cu				0.0013	0.0016	0.0013	0.0016	0.0016				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00002	0.00007	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00025	0.00024	0.00026	0.00024	0.00024				
Nickel Ni				0.0005	0.0006	0.0005	0.0005	0.0005				
Phosphorus P				0.019	0.021	0.026	0.022	0.022				
Potassium K				3.2	2.8	2.7	2.7	2.7				
Selenium Se				0.00088	0.00057	0.00061	0.00055	0.00055				
Silicon SiO2				0.54	0.54	0.54	0.54	0.54				
Silver Ag				0.0000038	0.0000040	0.0000036	0.0000036	0.0000036				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000006	0.0000006	0.0000005	0.0000005	0.0000005				
Tin Sn				0.00042	0.00042	0.00042	0.00042	0.00042				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000031	0.000038	0.000032	0.000032				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0012	0.0033	0.0030	0.0019	0.0019				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 6-A-3
Scenario 6

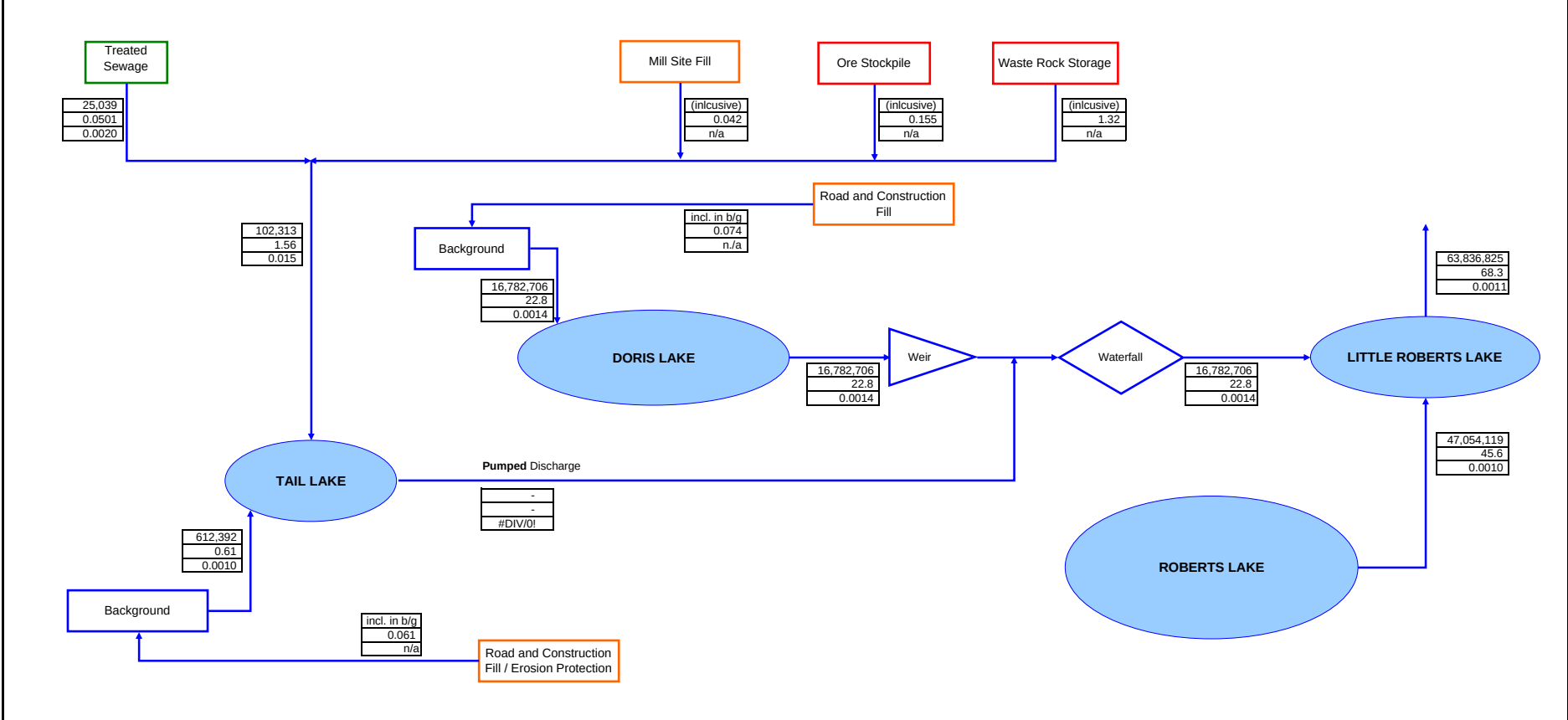
Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16	Year 10 Jan-17
Parameter												
TDS				145	129	135	157	159				
TSS				4.0	5.8	5.9	6.9	6.9				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN				0.001	0.001	0.001	0.001	0.001				
Sulphate				3.6	3.5	3.6	3.7	3.7				
Chloride				64	66	65	71	72				
Total Ammonia				0.005	0.008	0.014	0.013	0.013				
Nitrate				0.02	0.02	0.02	0.02	0.02				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				28	26	27	27	27				
OrthoPhosphate-P				0.0026	0.0025	0.0024	0.0024	0.0024				
Phosphate-P				0.0181	0.0193	0.0252	0.0208	0.0208				
Org. Carbon				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0005	0.0010	0.0029	0.0006	0.0006				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00002	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00019	0.00019	0.00018	0.00018	0.00018				
Boron B				0.034	0.022	0.023	0.022	0.022				
Cadmium Cd				0.0000031	0.0000031	0.0000026	0.0000026	0.0000026				
Calcium Ca				11	10	10	10	10				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0001	0.0002	0.0009	0.0002	0.0002				
Copper Cu				0.0013	0.0016	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.020	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00023	0.00023	0.00025	0.00023	0.00023				
Nickel Ni				0.0005	0.0006	0.0005	0.0005	0.0005				
Phosphorus P				0.019	0.020	0.026	0.022	0.022				
Potassium K				3.1	2.7	2.7	2.6	2.6				
Selenium Se				0.00088	0.00057	0.00061	0.00055	0.00055				
Silicon SiO2				0.54	0.54	0.54	0.54	0.54				
Silver Ag				0.0000037	0.0000039	0.0000035	0.0000035	0.0000035				
Sodium Na				39	34	36	35	35				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000005	0.0000006	0.0000006	0.0000006	0.0000007				
Tin Sn				0.00042	0.00042	0.00042	0.00042	0.00042				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000031	0.000038	0.000032	0.000032				
Vanadium V				0.0006	0.0001	0.0003	0.0002	0.0002				
Zinc Zn				0.0011	0.0033	0.0030	0.0019	0.0019				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

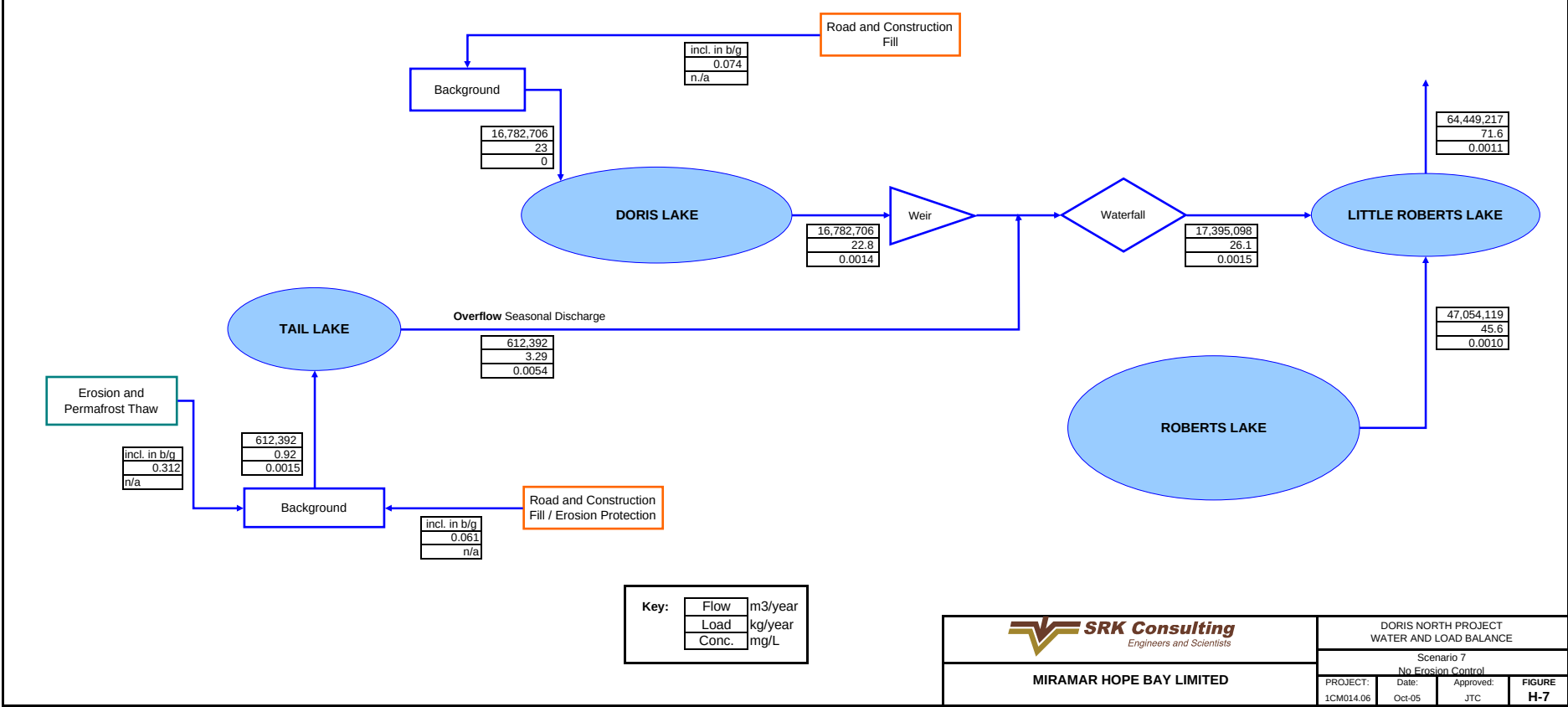
SCENARIO 7 OPERATIONAL CONDITIONS
Year 2



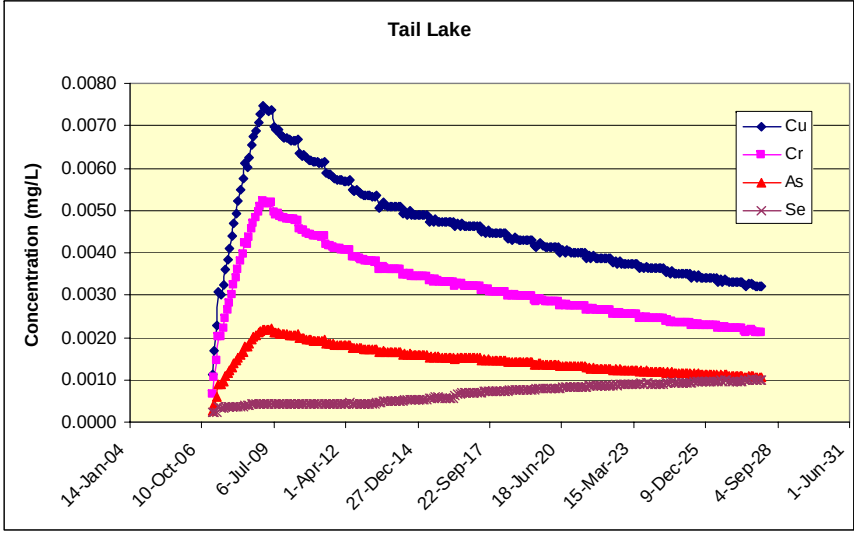
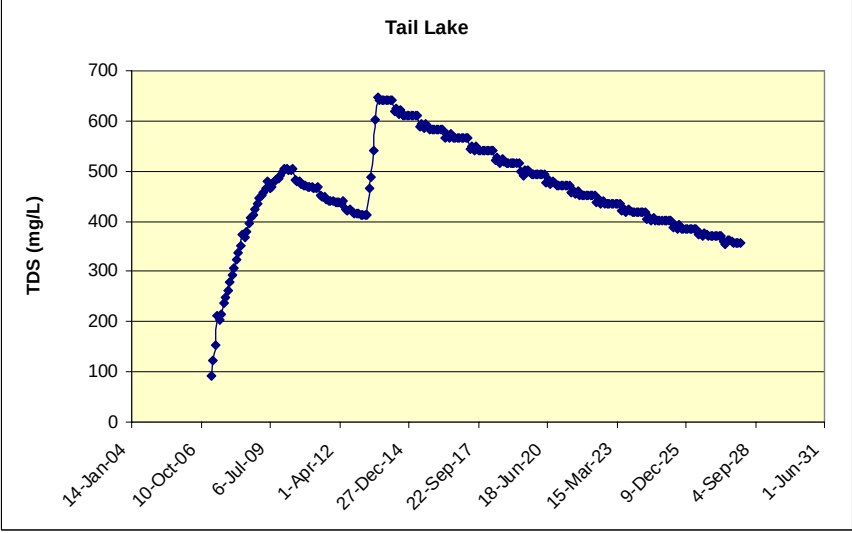
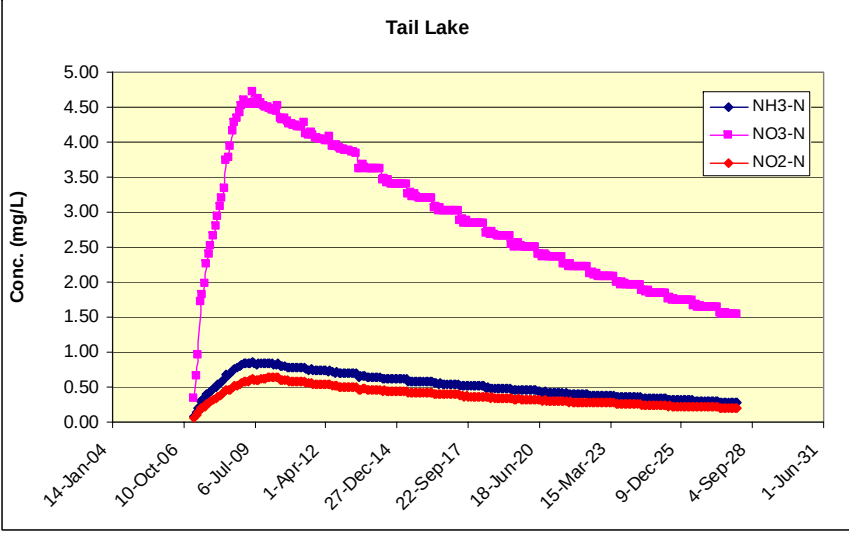
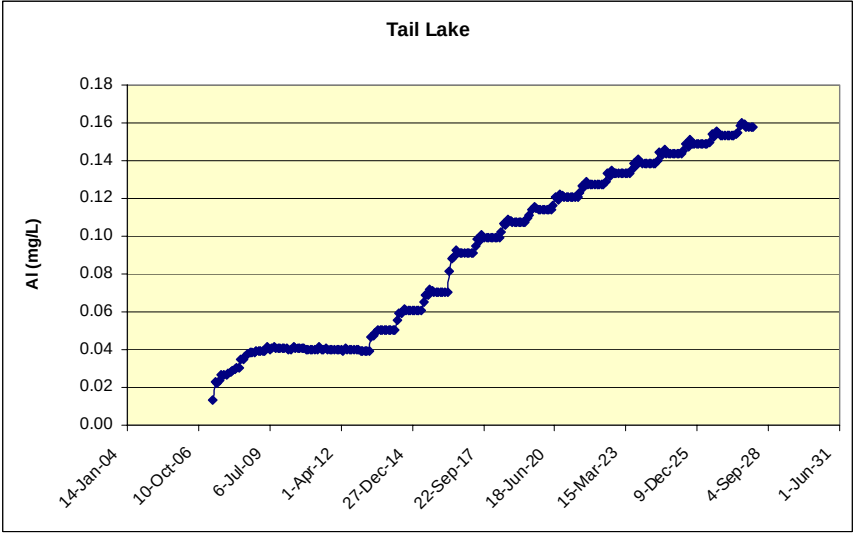
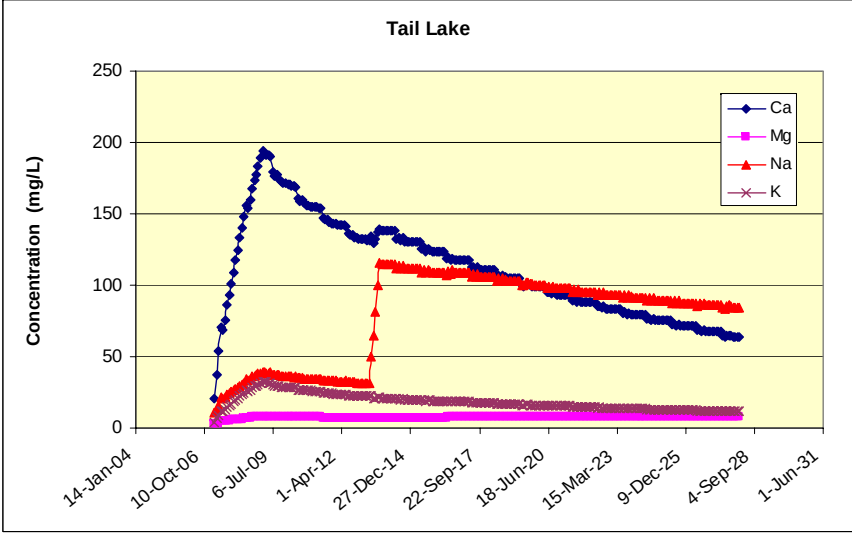
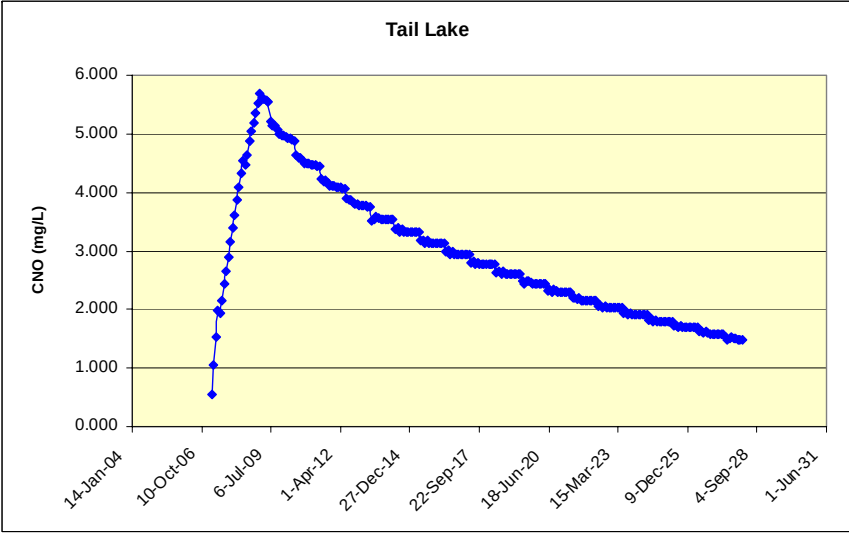
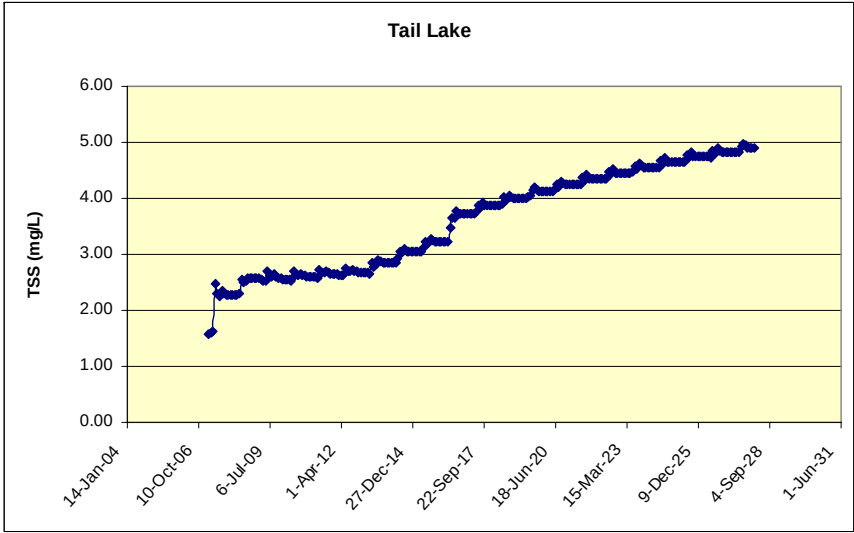
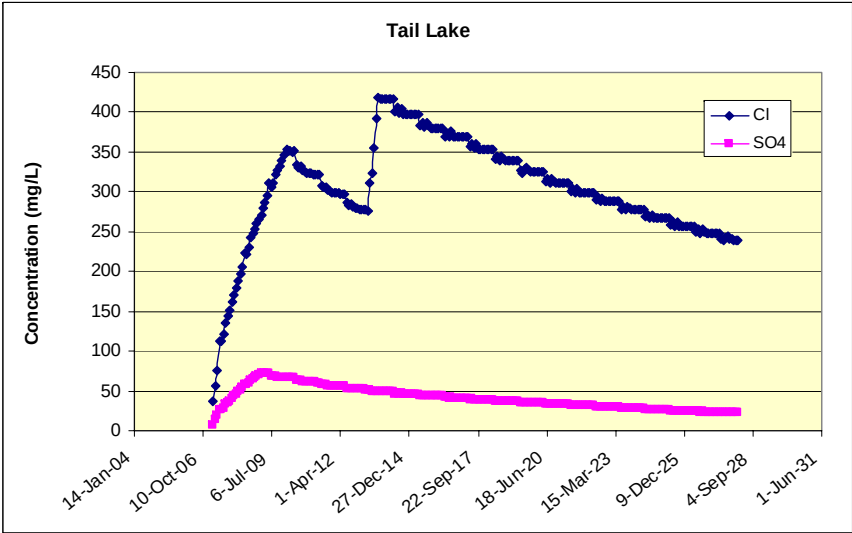
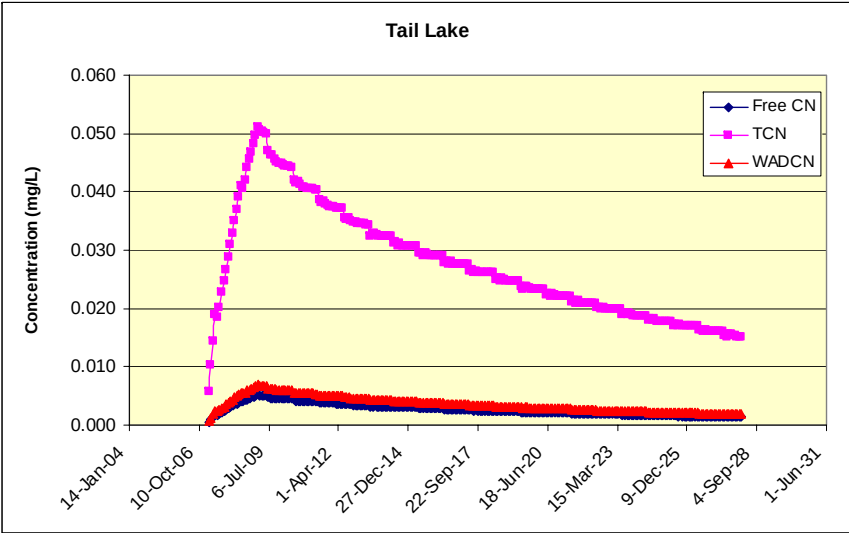
POST MILLING OPERATIONAL CONDITIONS
Year 3



POST CLOSURE CONDITIONS
Year 7



Scenario 7



Scenario 7

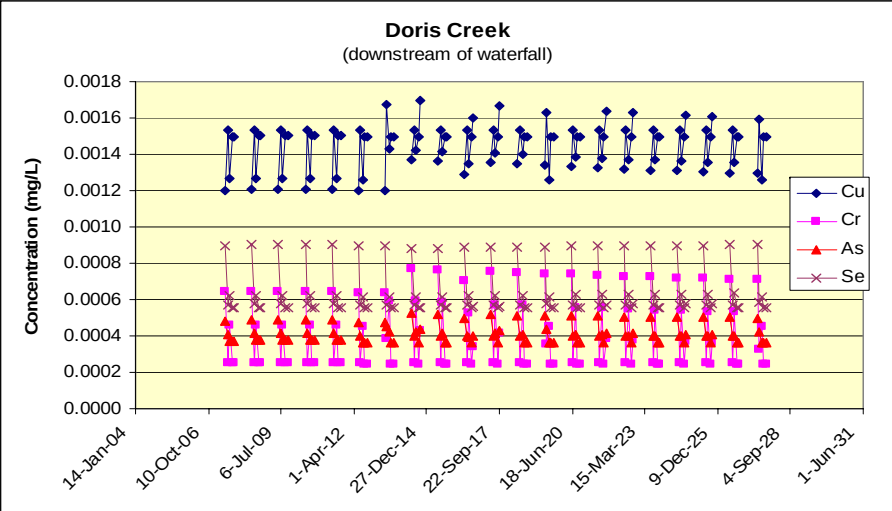
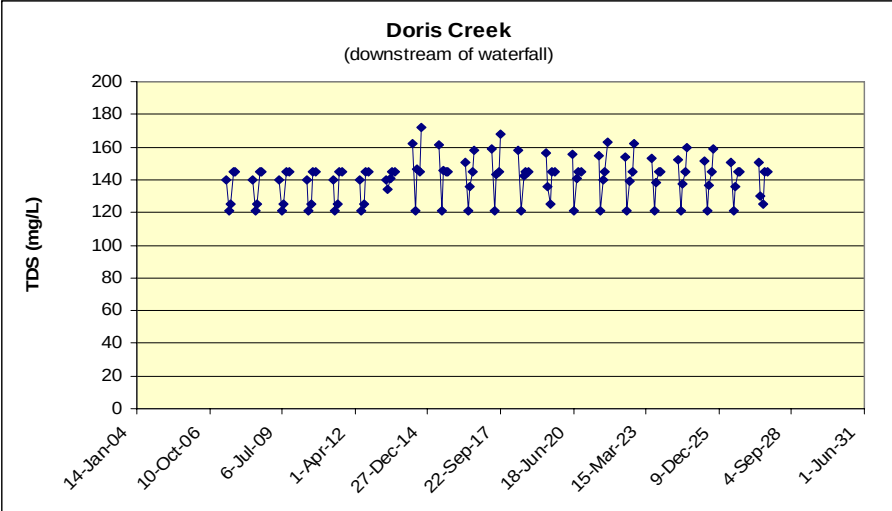
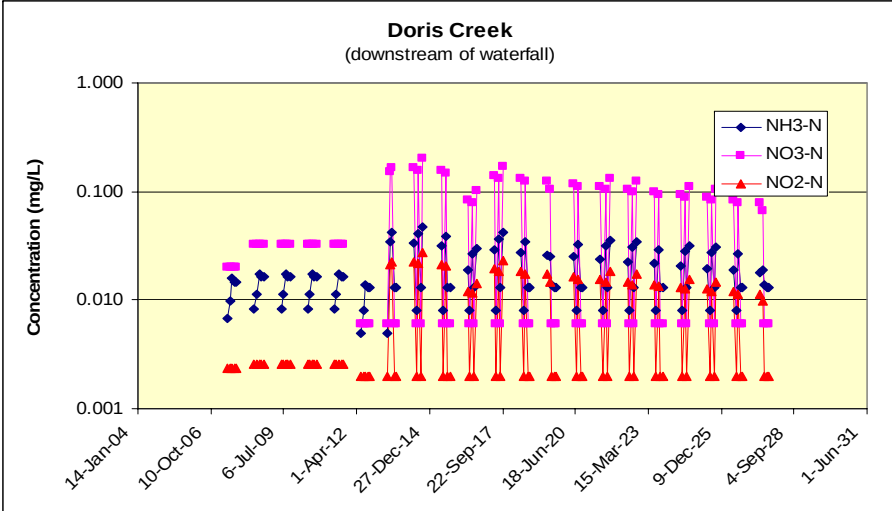
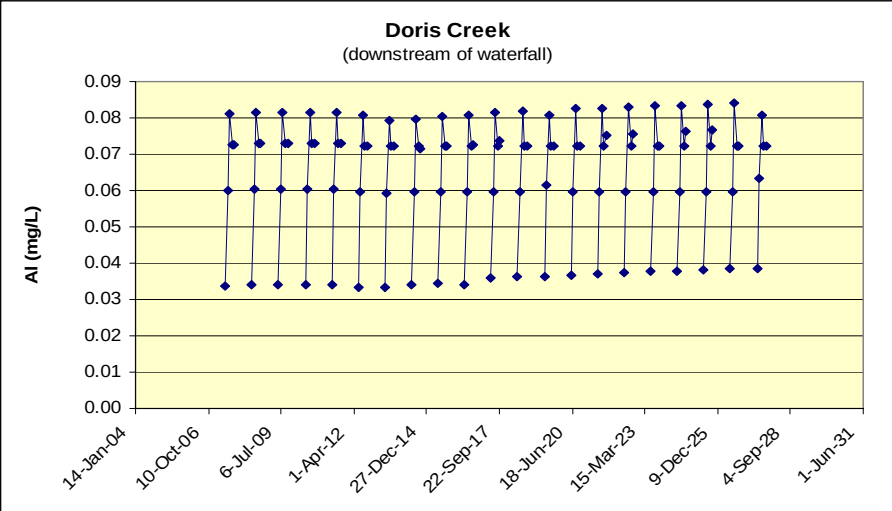
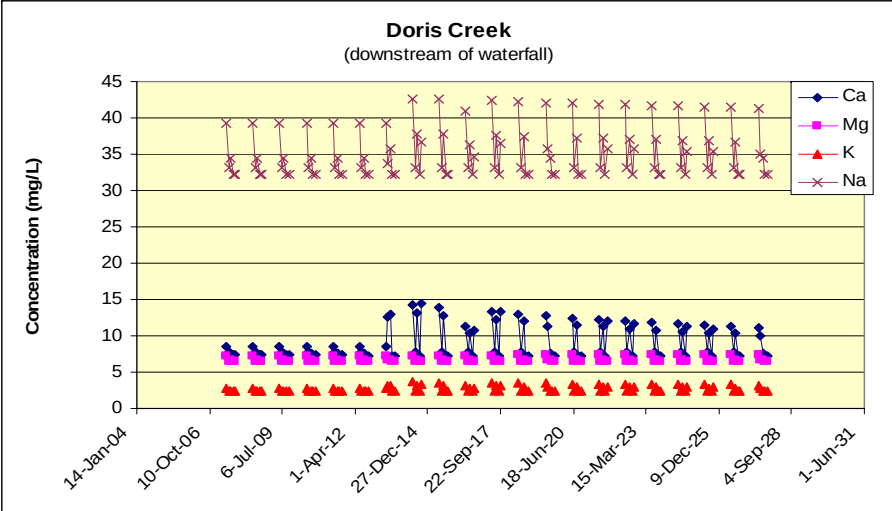
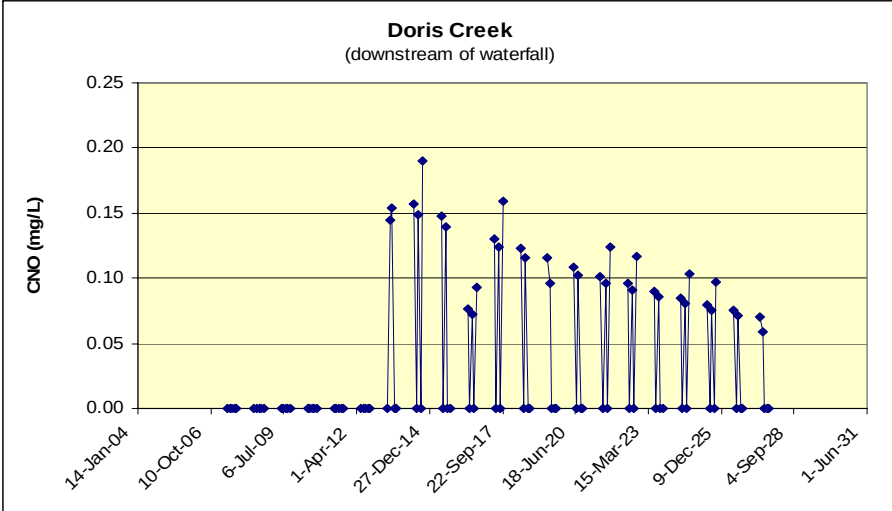
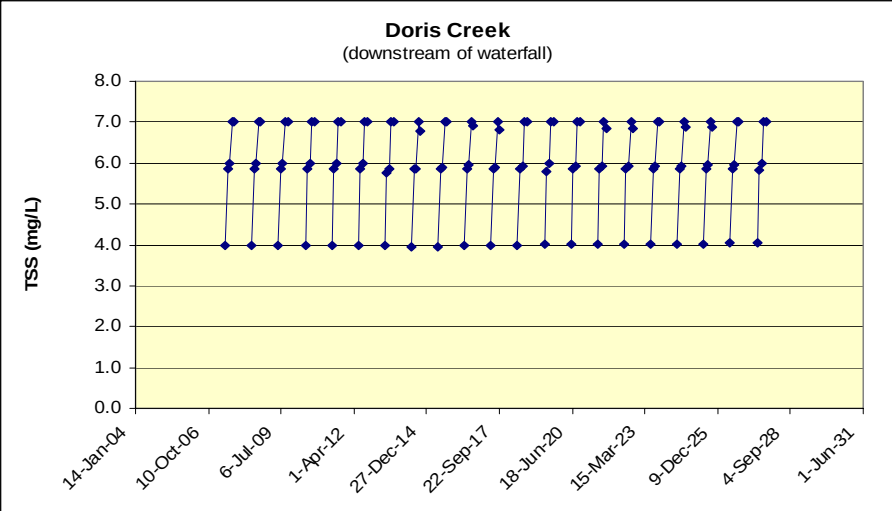
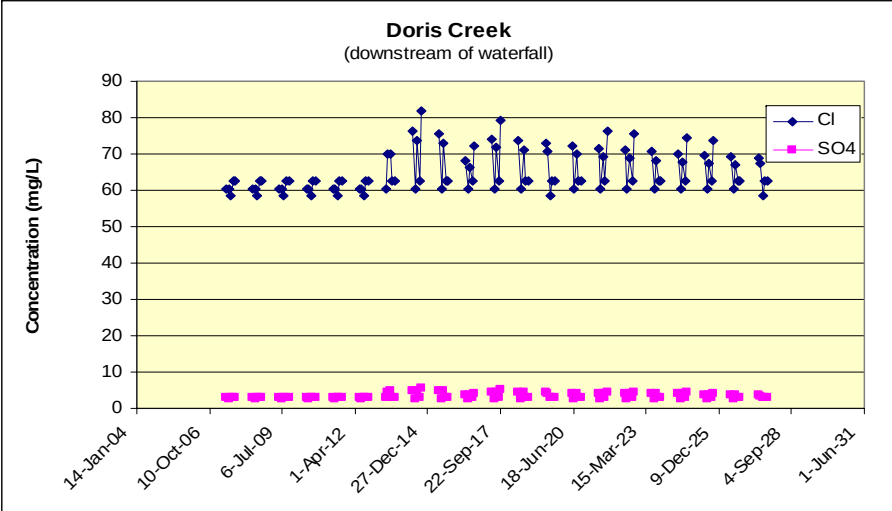
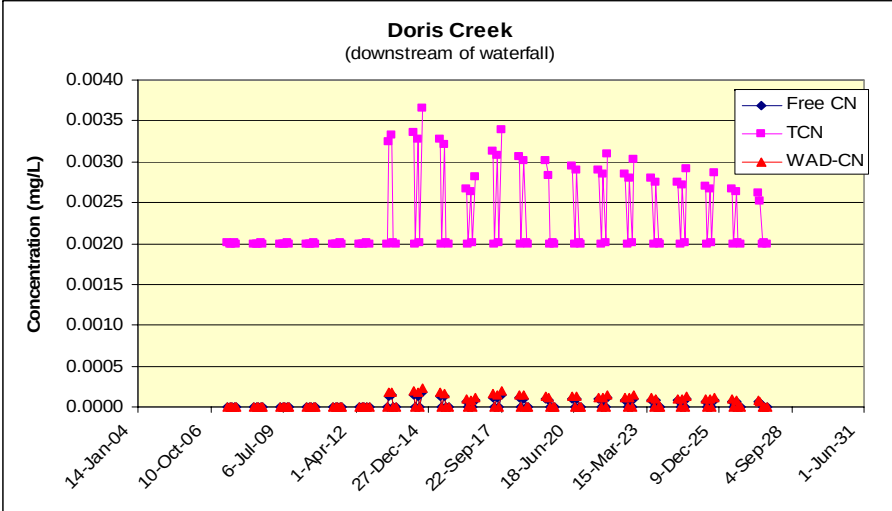


Table H-7-A-1
Scenario 7

OUTPUT SUMMARY						Fraction of CCME in Doris Creek (%)		
Discharge rate		m ³ /year						
Degradation None		Tail Lk Cu < CME Year 34						
Maximum Concentration		MMER	CCME	Tail Lake Year 2	Doris Creek Year 8	L'Roberts L Year 8		
pH			6 to 9	7 to 8	7 to 8	7 to 8	3%	
TDS	mg/L			646	172	178		
TSS	mg/L			5.0	7.0	8.1		
Free CN	mg/L		0.005	0.0052	0.00017	0.00009		
Total CN	mg/L	1.0		0.051	0.004	0.003		
WAD CN	mg/L			0.0069	0.0002	0.0001		
CNO	mg/L			5.7	0.19	0.10		
SCN	mg/L			0.078	0.003	0.001		
Sulphate	mg/L			72	5.5	5.8		
Chloride	mg/L			419	82	77		
Total Ammonia	mg/L		0.97	0.86	0.047	0.025		5%
Nitrate	mg/L		2.9	4.7	0.20	0.11		7%
Nitrite	mg/L		0.018	0.64	0.027	0.015		149%
Alkalinity	mg/L			48	28	26		
OrthoPhosphate-P	mg/L			0.1328	0.0059	0.0037		
Phosphate-P	mg/L			0.1361	0.0273	0.0263		
Org. Carbon	mg/L			6.6	7.5	7.1		
Hardness CaCO3	mg/L			90	47	46		
Total Metals								
Aluminum Al	mg/L		0.1	0.16	0.08	0.25	84%	
Antimony Sb	mg/L			0.0122	0.0031	0.0019	10%	
Arsenic As	mg/L	0.5	0.005	0.00	0.0005	0.0005		
Barium Ba	mg/L			0.0085	0.0033	0.0052		
Beryllium Be	mg/L			0.00051	0.00003	0.00002	10%	
Bismuth Bi	mg/L			0.01167	0.00048	0.00033		
Boron B	mg/L			0.036	0.035	0.030		
Cadmium Cd	mg/L		0.000038	0.000044	0.0000039	0.0000153	10%	
Calcium Ca	mg/L			194	14	11	77%	
Chromium Cr	mg/L		0.001	0.0052	0.0008	0.001		
Cobalt Co	mg/L			0.0081	0.0011	0.0005		
Copper Cu	mg/L	0.3	0.002	0.007	0.00169	0.0020	85%	
Iron Fe	mg/L		0.3	0.18	0.13	0.28	42%	
Lead Pb	mg/L	0.2	0.002	0.00033	0.00007	0.00026	3%	
Lithium Li	mg/L			0.0056	0.0030	0.0029	90%	
Magnesium Mg	mg/L			8.1	7.3	7.3		
Manganese Mn	mg/L			0.022	0.021	0.024		
Mercury Hg	mg/L		0.0001	0.0000124	0.00000123	0.0000009	1%	
Molybdenum Mo	mg/L		0.073	0.0070	0.00039	0.00033	1%	
Nickel Ni	mg/L	0.5	0.025	0.007	0.0007	0.0007	3%	
Phosphorus P	mg/L			0.201	0.029	0.027	7%	
Potassium K	mg/L			32	3.6	3.2		
Selenium Se	mg/L		0.001	0.00101	0.0009	0.00084		
Silicon SiO2	mg/L			3.2	0.61	0.57	4%	
Silver Ag	mg/L		0.0001	0.00011	0.0000069	0.0000057		
Sodium Na	mg/L			116	43	40		
Strontium Sr	mg/L			0.073	0.043	0.047	12%	
Tellurium Te	mg/L			0.054	0.050	0.052		
Thallium Tl	mg/L		0.0008	0.000040	0.000031	0.0020		
Thorium Th	mg/L			0.000047	0.0000025	0.0000013	4%	
Tin Sn	mg/L			0.00186	0.00045	0.00004		
Titanium Ti	mg/L			0.0141	0.0064	0.0064		
Uranium U	mg/L			0.000079	0.000040	0.000044	12%	
Vanadium V	mg/L			0.0028	0.0006	0.0005		
Zinc Zn	mg/L	0.5	0.03	0.018	0.0035	0.0055		
Zirconium Zr	mg/L			0.0056	0.0050	0.0052		

Table H-7-A-2
Scenario 7

Water Quality in TAIL LAKE

Date		Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter													
TDS	mg/L	92	124	155	213	204	215	237	249	261	278	293	307
TSS	mg/L	1.6	1.6	1.6	2.5	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3
Free CN	mg/L	0.00050	0.00096	0.00140	0.00180	0.00176	0.00195	0.00222	0.00242	0.00262	0.00286	0.00309	0.00329
Total CN	mg/L	0.006	0.010	0.014	0.019	0.018	0.020	0.023	0.025	0.027	0.029	0.031	0.033
WAD CN	mg/L	0.0007	0.0013	0.0019	0.0024	0.0024	0.0026	0.0030	0.0032	0.0035	0.0038	0.0041	0.0044
CNO	mg/L	0.55	1.05	1.54	1.98	1.94	2.15	2.44	2.66	2.88	3.14	3.40	3.62
SCN	mg/L	0.008	0.014	0.021	0.027	0.026	0.029	0.033	0.036	0.039	0.043	0.046	0.049
Sulphate	mg/L	7.5	13.4	19.1	26.4	26.3	28.9	32.7	35.3	37.7	40.8	43.7	46.2
Chloride	mg/L	37	57	76	112	112	121	135	144	151	161	171	179
Total Ammonia	mg/L	0.070	0.132	0.193	0.307	0.318	0.348	0.397	0.425	0.449	0.479	0.508	0.534
Nitrate	mg/L	0.35	0.66	0.97	1.71	1.81	1.98	2.26	2.40	2.51	2.66	2.80	2.93
Nitrite	mg/L	0.054	0.102	0.149	0.202	0.201	0.222	0.252	0.274	0.294	0.319	0.343	0.364
Alkalinity	mg/L	16	18	21	29	28	29	31	32	32	33	35	36
OrthoPhosphate-P	mg/L	0.0107	0.0195	0.0280	0.0363	0.0354	0.0390	0.0442	0.0481	0.0519	0.0565	0.0609	0.0648
Phosphate-P	mg/L	0.0142	0.0228	0.0313	0.0413	0.0397	0.0430	0.0481	0.0518	0.0555	0.0600	0.0644	0.0682
Org. Carbon	mg/L	3.0	2.9	2.8	4.4	4.1	3.9	4.0	3.8	3.7	3.6	3.6	3.5
Hardness CaCO3	mg/L	23	29	35	48	47	49	53	55	57	60	62	65
Total Metals													
Aluminum Al	mg/L	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03
Antimony Sb	mg/L	0.0007	0.0012	0.0017	0.0037	0.0040	0.0043	0.0050	0.0052	0.0054	0.0056	0.0058	0.0060
Arsenic As	mg/L	0.0003	0.0004	0.0006	0.0009	0.0009	0.0010	0.0011	0.0012	0.0012	0.0013	0.0014	0.0014
Barium Ba	mg/L	0.0015	0.0022	0.0028	0.0038	0.0037	0.0040	0.0044	0.0047	0.0049	0.0052	0.0055	0.0058
Beryllium Be	mg/L	0.00012	0.00014	0.00016	0.00027	0.00027	0.00027	0.00029	0.00030	0.00030	0.00030	0.00031	0.00032
Bismuth Bi	mg/L	0.00057	0.00108	0.00158	0.00343	0.00376	0.00409	0.00467	0.00490	0.00504	0.00526	0.00548	0.00567
Boron B	mg/L	0.007	0.008	0.009	0.015	0.015	0.015	0.016	0.016	0.017	0.017	0.017	0.018
Cadmium Cd	mg/L	0.0000044	0.0000074	0.0000104	0.0000171	0.0000177	0.0000192	0.0000218	0.0000231	0.0000242	0.0000257	0.0000271	0.0000284
Calcium Ca	mg/L	21	38	54	70	69	76	86	93	101	109	118	125
Chromium Cr	mg/L	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003
Cobalt Co	mg/L	0.0008	0.0015	0.0022	0.0029	0.0029	0.0031	0.0036	0.0039	0.0042	0.0045	0.0049	0.0052
Copper Cu	mg/L	0.0011	0.0017	0.0023	0.0031	0.0030	0.0032	0.0036	0.0038	0.0041	0.0044	0.0047	0.0049
Iron Fe	mg/L	0.02	0.02	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Lead Pb	mg/L	0.00005	0.00007	0.00009	0.00014	0.00015	0.00016	0.00017	0.00018	0.00019	0.00020	0.00021	0.00021
Lithium Li	mg/L	0.0019	0.0020	0.0022	0.0033	0.0031	0.0031	0.0033	0.0033	0.0033	0.0033	0.0034	0.0034
Magnesium Mg	mg/L	2.5	2.9	3.3	4.9	4.7	4.8	5.2	5.3	5.4	5.6	5.7	5.9
Manganese Mn	mg/L	0.002	0.004	0.006	0.008	0.008	0.009	0.010	0.011	0.012	0.013	0.014	0.014
Mercury Hg	mg/L	0.0000006	0.0000009	0.0000012	0.0000020	0.0000020	0.0000021	0.0000024	0.0000025	0.0000026	0.0000028	0.0000029	0.0000030
Molybdenum Mo	mg/L	0.00072	0.00133	0.00193	0.00251	0.00246	0.00271	0.00307	0.00334	0.00360	0.00392	0.00423	0.00450
Nickel Ni	mg/L	0.0008	0.0013	0.0018	0.0026	0.0026	0.0028	0.0031	0.0033	0.0035	0.0038	0.0041	0.0043
Phosphorus P	mg/L	0.020	0.033	0.047	0.065	0.064	0.070	0.079	0.085	0.091	0.098	0.104	0.110
Potassium K	mg/L	3.8	6.6	9.3	12.1	11.9	13.0	14.6	15.8	17.0	18.4	19.8	21.0
Selenium Se	mg/L	0.00022	0.00022	0.00023	0.00036	0.00034	0.00034	0.00035	0.00035	0.00035	0.00035	0.00035	0.00036
Silicon SiO2	mg/L	0.70	0.92	1.13	1.61	1.55	1.62	1.78	1.86	1.94	2.05	2.15	2.24
Silver Ag	mg/L	0.0000525	0.0000535	0.0000545	0.0000900	0.0000857	0.0000820	0.0000835	0.0000818	0.0000804	0.0000803	0.0000803	0.0000803
Sodium Na	mg/L	11	13	15	22	21	22	24	24	25	26	27	28
Strontium Sr	mg/L	0.017	0.021	0.026	0.037	0.036	0.037	0.041	0.043	0.044	0.047	0.049	0.051
Tellurium Te	mg/L	0.025	0.024	0.023	0.036	0.033	0.032	0.033	0.032	0.031	0.030	0.029	0.029
Thallium Tl	mg/L	0.000017	0.000018	0.000019	0.000029	0.000028	0.000028	0.000029	0.000029	0.000029	0.000030	0.000030	0.000030
Thorium Th	mg/L				0.000007	0.000009	0.000010	0.000011	0.000011	0.000011	0.000010	0.000010	0.000010
Tin Sn	mg/L	0.00013	0.00021	0.00028	0.00059	0.00066	0.00071	0.00081	0.00084	0.00086	0.00089	0.00091	0.00094
Titanium Ti	mg/L	0.0030	0.0030	0.0029	0.0046	0.0043	0.0041	0.0043	0.0041	0.0040	0.0040	0.0039	0.0039
Uranium U	mg/L	0.000025	0.000024	0.000024	0.000044	0.000043	0.000041	0.000042	0.000041	0.000039	0.000039	0.000038	0.000037
Vanadium V	mg/L	0.0004	0.0005	0.0007	0.0012	0.0012	0.0013	0.0014	0.0014	0.0015	0.0016	0.0016	0.0017
Zinc Zn	mg/L	0.0020	0.0034	0.0048	0.0066	0.0066	0.0072	0.0084	0.0091	0.0096	0.0104	0.0111	0.0117
Zirconium Zr	mg/L	0.0025	0.0024	0.0023	0.0038	0.0035	0.0034	0.0035	0.0034	0.0033	0.0032	0.0031	0.0031

Table H-7-A-2
Scenario 7

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter													
TDS	mg/L	322	336	351	373	367	379	396	406	414	425	436	445
TSS	mg/L	2.3	2.3	2.3	2.5	2.5	2.5	2.6	2.6	2.6	2.6	2.6	2.6
Free CN	mg/L	0.00351	0.00372	0.00393	0.00412	0.00406	0.00422	0.00444	0.00458	0.00471	0.00487	0.00503	0.00517
Total CN	mg/L	0.035	0.037	0.039	0.041	0.040	0.042	0.044	0.046	0.047	0.048	0.050	0.051
WAD CN	mg/L	0.0047	0.0050	0.0052	0.0055	0.0054	0.0056	0.0059	0.0061	0.0063	0.0065	0.0067	0.0069
CNO	mg/L	3.86	4.09	4.32	4.53	4.46	4.64	4.88	5.04	5.18	5.36	5.53	5.68
SCN	mg/L	0.053	0.056	0.059	0.062	0.061	0.063	0.067	0.069	0.071	0.073	0.075	0.078
Sulphate	mg/L	49.1	51.7	54.4	57.9	57.4	59.6	62.7	64.7	66.2	68.2	70.2	71.9
Chloride	mg/L	189	197	206	223	222	230	242	248	253	259	266	272
Total Ammonia	mg/L	0.563	0.589	0.617	0.676	0.679	0.706	0.746	0.767	0.781	0.801	0.820	0.837
Nitrate	mg/L	3.07	3.21	3.34	3.73	3.78	3.93	4.16	4.27	4.33	4.43	4.52	4.60
Nitrite	mg/L	0.387	0.409	0.431	0.457	0.452	0.470	0.495	0.511	0.524	0.540	0.557	0.571
Alkalinity	mg/L	37	38	39	42	41	42	44	45	45	46	47	47
OrthoPhosphate-P	mg/L	0.0691	0.0730	0.0771	0.0809	0.0797	0.0827	0.0870	0.0899	0.0923	0.0954	0.0984	0.1011
Phosphate-P	mg/L	0.0724	0.0763	0.0803	0.0846	0.0833	0.0863	0.0906	0.0933	0.0957	0.0987	0.1017	0.1043
Org. Carbon	mg/L	3.4	3.4	3.3	3.7	3.7	3.7	3.7	3.7	3.6	3.6	3.5	3.5
Hardness CaCO3	mg/L	68	70	73	77	77	79	82	84	85	87	89	90
Total Metals													
Aluminum Al	mg/L	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0063	0.0065	0.0067	0.0077	0.0079	0.0082	0.0088	0.0089	0.0090	0.0092	0.0093	0.0094
Arsenic As	mg/L	0.0015	0.0016	0.0017	0.0018	0.0018	0.0019	0.0020	0.0020	0.0020	0.0021	0.0022	0.0022
Barium Ba	mg/L	0.0061	0.0064	0.0067	0.0071	0.0070	0.0072	0.0076	0.0078	0.0079	0.0082	0.0084	0.0085
Beryllium Be	mg/L	0.00032	0.00033	0.00034	0.00039	0.00039	0.00040	0.00042	0.00042	0.00042	0.00043	0.00043	0.00044
Bismuth Bi	mg/L	0.00588	0.00608	0.00628	0.00728	0.00748	0.00779	0.00827	0.00845	0.00852	0.00865	0.00878	0.00889
Boron B	mg/L	0.018	0.018	0.018	0.021	0.021	0.022	0.022	0.023	0.023	0.023	0.023	0.024
Cadmium Cd	mg/L	0.0000298	0.0000311	0.0000324	0.0000358	0.0000360	0.0000374	0.0000395	0.0000406	0.0000412	0.0000422	0.0000431	0.0000439
Calcium Ca	mg/L	133	141	148	156	154	160	168	173	178	184	189	194
Chromium Cr	mg/L	0.004	0.004	0.004	0.004	0.004	0.004	0.005	0.005	0.005	0.005	0.005	0.005
Cobalt Co	mg/L	0.0055	0.0058	0.0061	0.0065	0.0064	0.0067	0.0070	0.0072	0.0074	0.0077	0.0079	0.0081
Copper Cu	mg/L	0.0052	0.0055	0.0058	0.0061	0.0060	0.0062	0.0065	0.0067	0.0069	0.0071	0.0073	0.0075
Iron Fe	mg/L	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00022	0.00023	0.00024	0.00027	0.00027	0.00028	0.00029	0.00030	0.00030	0.00031	0.00031	0.00032
Lithium Li	mg/L	0.0035	0.0036	0.0036	0.0040	0.0039	0.0040	0.0041	0.0042	0.0042	0.0042	0.0042	0.0043
Magnesium Mg	mg/L	6.1	6.2	6.4	6.9	6.9	7.1	7.4	7.5	7.5	7.6	7.8	7.9
Manganese Mn	mg/L	0.015	0.016	0.017	0.018	0.018	0.018	0.019	0.020	0.021	0.021	0.022	0.022
Mercury Hg	mg/L	0.0000032	0.0000033	0.0000034	0.0000038	0.0000038	0.0000039	0.0000042	0.0000042	0.0000043	0.0000044	0.0000045	0.0000046
Molybdenum Mo	mg/L	0.00480	0.00507	0.00536	0.00563	0.00555	0.00576	0.00606	0.00626	0.00642	0.00664	0.00685	0.00703
Nickel Ni	mg/L	0.0045	0.0048	0.0050	0.0053	0.0053	0.0055	0.0058	0.0059	0.0060	0.0062	0.0064	0.0065
Phosphorus P	mg/L	0.117	0.123	0.129	0.138	0.137	0.142	0.149	0.154	0.157	0.162	0.166	0.170
Potassium K	mg/L	22.3	23.6	24.9	26.1	25.8	26.7	28.1	29.0	29.7	30.7	31.6	32.5
Selenium Se	mg/L	0.00036	0.00036	0.00036	0.00041	0.00040	0.00041	0.00042	0.00042	0.00042	0.00042	0.00042	0.00043
Silicon SiO2	mg/L	2.35	2.44	2.54	2.72	2.69	2.77	2.90	2.97	3.02	3.09	3.16	3.22
Silver Ag	mg/L	0.0000804	0.0000805	0.0000807	0.0000931	0.0000935	0.0000939	0.0000963	0.0000961	0.0000953	0.0000951	0.0000950	0.0000949
Sodium Na	mg/L	30	31	32	34	33	34	36	37	37	38	39	39
Strontium Sr	mg/L	0.053	0.055	0.058	0.062	0.061	0.063	0.066	0.067	0.068	0.070	0.071	0.073
Tellurium Te	mg/L	0.028	0.028	0.027	0.031	0.030	0.030	0.031	0.030	0.030	0.029	0.029	0.029
Thallium Tl	mg/L	0.000031	0.000031	0.000031	0.000035	0.000035	0.000035	0.000037	0.000037	0.000037	0.000037	0.000037	0.000038
Thorium Th	mg/L	0.000010	0.000010	0.000009	0.000013	0.000015	0.000015	0.000017	0.000017	0.000016	0.000016	0.000016	0.000016
Tin Sn	mg/L	0.00097	0.00100	0.00103	0.00119	0.00122	0.00127	0.00135	0.00138	0.00138	0.00140	0.00142	0.00143
Titanium Ti	mg/L	0.0038	0.0038	0.0037	0.0042	0.0042	0.0042	0.0043	0.0042	0.0042	0.0041	0.0041	0.0040
Uranium U	mg/L	0.000037	0.000036	0.000036	0.000043	0.000044	0.000045	0.000046	0.000045	0.000044	0.000044	0.000043	0.000043
Vanadium V	mg/L	0.0017	0.0018	0.0019	0.0021	0.0021	0.0022	0.0023	0.0023	0.0024	0.0024	0.0024	0.0025
Zinc Zn	mg/L	0.0124	0.0130	0.0137	0.0145	0.0144	0.0149	0.0158	0.0162	0.0166	0.0171	0.0176	0.0180
Zirconium Zr	mg/L	0.0030	0.0030	0.0029	0.0033	0.0033	0.0033	0.0034	0.0034	0.0033	0.0032	0.0032	0.0031

Table H-7-A-2
Scenario 7

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter													
TDS	mg/L	450	458	466	481	465	469	479	481	485	492	499	505
TSS	mg/L	2.5	2.5	2.5	2.7	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Free CN	mg/L	0.00511	0.00509	0.00507	0.00504	0.00474	0.00467	0.00467	0.00460	0.00455	0.00453	0.00451	0.00449
Total CN	mg/L	0.051	0.050	0.050	0.050	0.047	0.046	0.046	0.046	0.045	0.045	0.045	0.045
WAD CN	mg/L	0.0068	0.0068	0.0068	0.0067	0.0063	0.0062	0.0062	0.0061	0.0061	0.0060	0.0060	0.0060
CNO	mg/L	5.62	5.60	5.57	5.54	5.22	5.14	5.14	5.06	5.01	4.98	4.96	4.94
SCN	mg/L	0.077	0.076	0.076	0.076	0.071	0.070	0.070	0.069	0.068	0.068	0.068	0.067
Sulphate	mg/L	71.4	71.4	71.3	72.0	68.5	67.9	68.4	67.7	67.2	67.1	67.1	67.0
Chloride	mg/L	279	287	296	310	305	311	322	327	332	339	346	353
Total Ammonia	mg/L	0.833	0.834	0.835	0.861	0.830	0.829	0.841	0.835	0.831	0.831	0.832	0.834
Nitrate	mg/L	4.56	4.55	4.53	4.71	4.56	4.55	4.61	4.57	4.52	4.51	4.49	4.48
Nitrite	mg/L	0.578	0.588	0.598	0.612	0.591	0.595	0.608	0.611	0.616	0.624	0.633	0.642
Alkalinity	mg/L	47	47	46	48	46	45	46	45	45	44	44	44
OrthoPhosphate-P	mg/L	0.1043	0.1080	0.1118	0.1154	0.1127	0.1150	0.1188	0.1208	0.1233	0.1265	0.1298	0.1328
Phosphate-P	mg/L	0.1075	0.1112	0.1150	0.1190	0.1161	0.1184	0.1222	0.1242	0.1267	0.1299	0.1332	0.1361
Org. Carbon	mg/L	3.4	3.4	3.4	3.8	3.7	3.7	3.8	3.7	3.7	3.7	3.7	3.7
Hardness CaCO3	mg/L	89	89	89	90	86	85	86	84	84	83	83	83
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0096	0.0098	0.0100	0.0108	0.0108	0.0110	0.0115	0.0116	0.0117	0.0118	0.0120	0.0122
Arsenic As	mg/L	0.0022	0.0022	0.0022	0.0022	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021
Barium Ba	mg/L	0.0085	0.0084	0.0084	0.0085	0.0081	0.0080	0.0081	0.0080	0.0079	0.0079	0.0079	0.0078
Beryllium Be	mg/L	0.00044	0.00044	0.00044	0.00048	0.00048	0.00048	0.00049	0.00049	0.00049	0.00050	0.00050	0.00050
Bismuth Bi	mg/L	0.00904	0.00924	0.00944	0.01029	0.01030	0.01054	0.01096	0.01108	0.01118	0.01134	0.01151	0.01167
Boron B	mg/L	0.023	0.023	0.023	0.025	0.024	0.024	0.025	0.024	0.024	0.024	0.024	0.024
Cadmium Cd	mg/L	0.0000435	0.0000433	0.0000431	0.0000440	0.0000421	0.0000418	0.0000421	0.0000416	0.0000412	0.0000410	0.0000409	0.0000407
Calcium Ca	mg/L	192	192	191	190	179	177	177	174	173	172	171	171
Chromium Cr	mg/L	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Cobalt Co	mg/L	0.0080	0.0080	0.0080	0.0080	0.0076	0.0075	0.0075	0.0074	0.0073	0.0073	0.0073	0.0073
Copper Cu	mg/L	0.0074	0.0074	0.0073	0.0074	0.0070	0.0069	0.0069	0.0068	0.0068	0.0067	0.0067	0.0067
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00032	0.00032	0.00032	0.00033	0.00032	0.00032	0.00033	0.00033	0.00033	0.00033	0.00033	0.00033
Lithium Li	mg/L	0.0042	0.0042	0.0042	0.0045	0.0043	0.0043	0.0044	0.0043	0.0043	0.0043	0.0043	0.0043
Magnesium Mg	mg/L	7.8	7.8	7.8	8.1	7.8	7.8	7.9	7.8	7.7	7.7	7.7	7.7
Manganese Mn	mg/L	0.022	0.022	0.022	0.022	0.021	0.021	0.021	0.021	0.020	0.020	0.020	0.020
Mercury Hg	mg/L	0.0000045	0.0000045	0.0000045	0.0000046	0.0000044	0.0000044	0.0000044	0.0000044	0.0000043	0.0000043	0.0000043	0.0000043
Molybdenum Mo	mg/L	0.00696	0.00693	0.00690	0.00688	0.00648	0.00639	0.00640	0.00630	0.00624	0.00621	0.00619	0.00617
Nickel Ni	mg/L	0.0065	0.0065	0.0065	0.0066	0.0063	0.0062	0.0063	0.0062	0.0062	0.0062	0.0062	0.0061
Phosphorus P	mg/L	0.173	0.177	0.181	0.186	0.181	0.183	0.187	0.189	0.191	0.194	0.198	0.201
Potassium K	mg/L	32.1	32.0	31.8	31.8	30.0	29.6	29.6	29.1	28.8	28.7	28.6	28.5
Selenium Se	mg/L	0.00042	0.00042	0.00042	0.00045	0.00043	0.00043	0.00044	0.00043	0.00043	0.00042	0.00042	0.00042
Silicon SiO2	mg/L	3.19	3.18	3.17	3.22	3.07	3.04	3.05	3.01	2.98	2.97	2.96	2.95
Silver Ag	mg/L	0.0000944	0.0000944	0.0000945	0.0001036	0.0001024	0.0001020	0.0001032	0.0001023	0.0001017	0.0001017	0.0001017	0.0001017
Sodium Na	mg/L	39	39	39	39	38	37	37	37	36	36	36	36
Strontium Sr	mg/L	0.072	0.072	0.071	0.073	0.069	0.069	0.069	0.068	0.068	0.067	0.067	0.067
Tellurium Te	mg/L	0.028	0.028	0.028	0.031	0.031	0.031	0.031	0.031	0.031	0.030	0.030	0.030
Thallium Tl	mg/L	0.000037	0.000037	0.000037	0.000039	0.000038	0.000038	0.000038	0.000038	0.000037	0.000037	0.000037	0.000037
Thorium Th	mg/L	0.000016	0.000015	0.000015	0.000017	0.000017	0.000018	0.000018	0.000018	0.000018	0.000018	0.000018	0.000018
Tin Sn	mg/L	0.00146	0.00148	0.00151	0.00165	0.00166	0.00169	0.00176	0.00178	0.00179	0.00182	0.00184	0.00186
Titanium Ti	mg/L	0.0040	0.0040	0.0040	0.0044	0.0044	0.0044	0.0045	0.0044	0.0044	0.0044	0.0044	0.0044
Uranium U	mg/L	0.000043	0.000042	0.000042	0.000047	0.000047	0.000047	0.000048	0.000048	0.000047	0.000047	0.000047	0.000047
Vanadium V	mg/L	0.0025	0.0025	0.0025	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0028	0.0028	0.0028
Zinc Zn	mg/L	0.0179	0.0178	0.0178	0.0179	0.0170	0.0168	0.0170	0.0168	0.0167	0.0166	0.0166	0.0166
Zirconium Zr	mg/L	0.0031	0.0031	0.0031	0.0034	0.0034	0.0034	0.0035	0.0034	0.0034	0.0034	0.0034	0.0034

Table H-7-A-2
Scenario 7

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter													
TDS	mg/L	504	503	501	506	484	479	481	475	472	470	469	468
TSS	mg/L	2.5	2.5	2.5	2.7	2.6	2.6	2.7	2.6	2.6	2.6	2.6	2.6
Free CN	mg/L	0.00448	0.00447	0.00446	0.00444	0.00422	0.00417	0.00418	0.00413	0.00410	0.00408	0.00408	0.00407
Total CN	mg/L	0.045	0.044	0.044	0.044	0.042	0.042	0.042	0.041	0.041	0.041	0.041	0.041
WAD CN	mg/L	0.0060	0.0060	0.0059	0.0059	0.0056	0.0056	0.0056	0.0055	0.0055	0.0054	0.0054	0.0054
CNO	mg/L	4.93	4.92	4.90	4.89	4.64	4.59	4.60	4.54	4.51	4.49	4.48	4.48
SCN	mg/L	0.067	0.067	0.067	0.067	0.063	0.063	0.063	0.062	0.061	0.061	0.061	0.061
Sulphate	mg/L	66.8	66.7	66.5	66.4	63.2	62.5	62.6	61.9	61.4	61.2	61.1	61.0
Chloride	mg/L	352	351	350	351	334	331	332	328	325	324	323	323
Total Ammonia	mg/L	0.831	0.829	0.827	0.835	0.799	0.793	0.798	0.789	0.783	0.781	0.779	0.778
Nitrate	mg/L	4.47	4.46	4.45	4.52	4.34	4.31	4.34	4.30	4.26	4.25	4.24	4.24
Nitrite	mg/L	0.639	0.638	0.636	0.636	0.605	0.599	0.601	0.594	0.589	0.587	0.586	0.585
Alkalinity	mg/L	44	44	44	45	43	43	44	43	43	43	42	42
OrthoPhosphate-P	mg/L	0.1324	0.1321	0.1317	0.1314	0.1248	0.1235	0.1237	0.1222	0.1212	0.1209	0.1206	0.1204
Phosphate-P	mg/L	0.1357	0.1354	0.1350	0.1351	0.1284	0.1271	0.1273	0.1257	0.1247	0.1244	0.1241	0.1239
Org. Carbon	mg/L	3.6	3.6	3.6	4.0	3.9	3.9	4.0	4.0	3.9	3.9	3.9	3.9
Hardness CaCO3	mg/L	82	82	82	83	80	80	80	79	79	79	78	78
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0121	0.0121	0.0121	0.0120	0.0114	0.0113	0.0113	0.0112	0.0111	0.0111	0.0111	0.0110
Arsenic As	mg/L	0.0021	0.0021	0.0020	0.0021	0.0020	0.0020	0.0020	0.0020	0.0019	0.0019	0.0019	0.0019
Barium Ba	mg/L	0.0078	0.0078	0.0078	0.0078	0.0075	0.0074	0.0075	0.0074	0.0073	0.0073	0.0073	0.0073
Beryllium Be	mg/L	0.00050	0.00050	0.00050	0.00051	0.00049	0.00049	0.00049	0.00048	0.00048	0.00048	0.00048	0.00048
Bismuth Bi	mg/L	0.01163	0.01160	0.01157	0.01154	0.01096	0.01084	0.01086	0.01073	0.01064	0.01061	0.01059	0.01057
Boron B	mg/L	0.024	0.024	0.024	0.025	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024
Cadmium Cd	mg/L	0.0000406	0.0000405	0.0000404	0.0000413	0.0000397	0.0000395	0.0000399	0.0000395	0.0000392	0.0000391	0.0000390	0.0000389
Calcium Ca	mg/L	170	170	169	169	161	159	159	157	156	155	155	155
Chromium Cr	mg/L	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004
Cobalt Co	mg/L	0.0072	0.0072	0.0072	0.0072	0.0068	0.0068	0.0068	0.0067	0.0066	0.0066	0.0066	0.0066
Copper Cu	mg/L	0.0067	0.0066	0.0066	0.0067	0.0064	0.0063	0.0063	0.0062	0.0062	0.0062	0.0062	0.0061
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00033	0.00033	0.00033	0.00033	0.00032	0.00032	0.00032	0.00031	0.00031	0.00031	0.00031	0.00031
Lithium Li	mg/L	0.0043	0.0043	0.0043	0.0044	0.0043	0.0043	0.0043	0.0043	0.0042	0.0042	0.0042	0.0042
Magnesium Mg	mg/L	7.7	7.7	7.6	7.9	7.6	7.5	7.6	7.5	7.5	7.4	7.4	7.4
Manganese Mn	mg/L	0.020	0.020	0.020	0.020	0.019	0.019	0.019	0.019	0.018	0.018	0.018	0.018
Mercury Hg	mg/L	0.0000043	0.0000043	0.0000043	0.0000043	0.0000042	0.0000042	0.0000042	0.0000042	0.0000041	0.0000041	0.0000041	0.0000041
Molybdenum Mo	mg/L	0.00615	0.00613	0.00612	0.00610	0.00580	0.00574	0.00575	0.00568	0.00563	0.00561	0.00560	0.00559
Nickel Ni	mg/L	0.0061	0.0061	0.0061	0.0061	0.0058	0.0058	0.0058	0.0057	0.0057	0.0056	0.0056	0.0056
Phosphorus P	mg/L	0.200	0.200	0.199	0.199	0.190	0.188	0.188	0.186	0.185	0.184	0.184	0.183
Potassium K	mg/L	28.4	28.3	28.3	28.3	26.9	26.6	26.7	26.3	26.1	26.1	26.0	26.0
Selenium Se	mg/L	0.00042	0.00042	0.00042	0.00044	0.00043	0.00043	0.00044	0.00043	0.00043	0.00043	0.00043	0.00042
Silicon SiO2	mg/L	2.94	2.93	2.93	2.98	2.85	2.83	2.85	2.82	2.79	2.79	2.78	2.78
Silver Ag	mg/L	0.0001014	0.0001012	0.0001009	0.0001074	0.0001052	0.0001044	0.0001049	0.0001038	0.0001030	0.0001027	0.0001024	0.0001023
Sodium Na	mg/L	36	36	36	37	35	35	35	35	34	34	34	34
Strontium Sr	mg/L	0.067	0.067	0.066	0.067	0.065	0.064	0.065	0.064	0.063	0.063	0.063	0.063
Tellurium Te	mg/L	0.030	0.030	0.030	0.033	0.032	0.032	0.033	0.033	0.032	0.032	0.032	0.032
Thallium Tl	mg/L	0.000037	0.000037	0.000036	0.000038	0.000037	0.000037	0.000038	0.000037	0.000037	0.000037	0.000037	0.000037
Thorium Th	mg/L	0.000018	0.000018	0.000018	0.000019	0.000019	0.000020	0.000020	0.000020	0.000020	0.000020	0.000020	0.000020
Tin Sn	mg/L	0.00186	0.00185	0.00185	0.00185	0.00177	0.00175	0.00176	0.00174	0.00172	0.00172	0.00172	0.00171
Titanium Ti	mg/L	0.0044	0.0043	0.0043	0.0047	0.0046	0.0046	0.0046	0.0046	0.0046	0.0046	0.0045	0.0045
Uranium U	mg/L	0.000047	0.000046	0.000046	0.000051	0.000051	0.000051	0.000051	0.000051	0.000050	0.000050	0.000050	0.000050
Vanadium V	mg/L	0.0028	0.0028	0.0028	0.0028	0.0027	0.0027	0.0027	0.0026	0.0026	0.0026	0.0026	0.0026
Zinc Zn	mg/L	0.0165	0.0165	0.0165	0.0165	0.0157	0.0155	0.0156	0.0155	0.0153	0.0153	0.0153	0.0152
Zirconium Zr	mg/L	0.0033	0.0033	0.0033	0.0036	0.0036	0.0036	0.0037	0.0036	0.0036	0.0036	0.0036	0.0036

Table H-7-A-2
Scenario 7

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter													
TDS	mg/L	468	467	466	470	451	448	449	445	441	440	439	439
TSS	mg/L	2.6	2.6	2.6	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.6	2.6
Free CN	mg/L	0.00406	0.00405	0.00404	0.00403	0.00385	0.00381	0.00382	0.00378	0.00375	0.00374	0.00373	0.00372
Total CN	mg/L	0.041	0.040	0.040	0.040	0.039	0.038	0.038	0.038	0.038	0.037	0.037	0.037
WAD CN	mg/L	0.0054	0.0054	0.0054	0.0054	0.0051	0.0051	0.0051	0.0050	0.0050	0.0050	0.0050	0.0050
CNO	mg/L	4.47	4.46	4.45	4.43	4.23	4.19	4.20	4.15	4.12	4.11	4.10	4.10
SCN	mg/L	0.061	0.061	0.061	0.060	0.058	0.057	0.057	0.057	0.056	0.056	0.056	0.056
Sulphate	mg/L	60.9	60.7	60.6	60.5	57.9	57.3	57.5	56.8	56.4	56.3	56.1	56.1
Chloride	mg/L	322	322	321	321	308	305	306	303	300	300	299	298
Total Ammonia	mg/L	0.776	0.775	0.773	0.780	0.750	0.746	0.750	0.743	0.738	0.736	0.734	0.733
Nitrate	mg/L	4.23	4.22	4.21	4.27	4.12	4.10	4.13	4.10	4.07	4.05	4.05	4.04
Nitrite	mg/L	0.584	0.583	0.581	0.581	0.556	0.551	0.553	0.547	0.543	0.541	0.540	0.539
Alkalinity	mg/L	42	42	42	43	42	42	42	42	41	41	41	41
OrthoPhosphate-P	mg/L	0.1202	0.1199	0.1197	0.1194	0.1140	0.1130	0.1132	0.1119	0.1111	0.1108	0.1106	0.1104
Phosphate-P	mg/L	0.1237	0.1234	0.1231	0.1232	0.1177	0.1167	0.1169	0.1156	0.1147	0.1144	0.1142	0.1140
Org. Carbon	mg/L	3.9	3.9	3.9	4.2	4.1	4.1	4.2	4.2	4.1	4.1	4.1	4.1
Hardness CaCO3	mg/L	78	78	78	79	77	76	77	76	75	75	75	75
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0110	0.0110	0.0110	0.0109	0.0105	0.0104	0.0104	0.0103	0.0102	0.0102	0.0101	0.0101
Arsenic As	mg/L	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0018	0.0018	0.0018	0.0018	0.0018
Barium Ba	mg/L	0.0073	0.0073	0.0072	0.0073	0.0070	0.0070	0.0070	0.0069	0.0069	0.0069	0.0068	0.0068
Beryllium Be	mg/L	0.00048	0.00048	0.00047	0.00049	0.00047	0.00047	0.00047	0.00046	0.00046	0.00046	0.00046	0.00046
Bismuth Bi	mg/L	0.01055	0.01053	0.01051	0.01048	0.01001	0.00991	0.00993	0.00982	0.00975	0.00972	0.00970	0.00969
Boron B	mg/L	0.024	0.024	0.023	0.024	0.024	0.023	0.024	0.023	0.023	0.023	0.023	0.023
Cadmium Cd	mg/L	0.0000389	0.0000388	0.0000387	0.0000395	0.0000382	0.0000380	0.0000384	0.0000380	0.0000377	0.0000376	0.0000376	0.0000375
Calcium Ca	mg/L	155	155	154	154	147	146	146	145	144	143	143	143
Chromium Cr	mg/L	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Cobalt Co	mg/L	0.0066	0.0066	0.0066	0.0065	0.0062	0.0062	0.0062	0.0061	0.0061	0.0061	0.0061	0.0060
Copper Cu	mg/L	0.0061	0.0061	0.0061	0.0061	0.0059	0.0058	0.0059	0.0058	0.0057	0.0057	0.0057	0.0057
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00031	0.00031	0.00031	0.00031	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00029
Lithium Li	mg/L	0.0042	0.0042	0.0042	0.0043	0.0042	0.0042	0.0043	0.0042	0.0042	0.0042	0.0042	0.0042
Magnesium Mg	mg/L	7.4	7.4	7.4	7.5	7.3	7.3	7.3	7.3	7.2	7.2	7.2	7.2
Manganese Mn	mg/L	0.018	0.018	0.018	0.018	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017
Mercury Hg	mg/L	0.0000041	0.0000041	0.0000041	0.0000042	0.0000040	0.0000040	0.0000040	0.0000040	0.0000040	0.0000040	0.0000039	0.0000039
Molybdenum Mo	mg/L	0.00558	0.00557	0.00556	0.00555	0.00530	0.00525	0.00526	0.00520	0.00516	0.00515	0.00514	0.00513
Nickel Ni	mg/L	0.0056	0.0056	0.0056	0.0056	0.0054	0.0053	0.0053	0.0053	0.0052	0.0052	0.0052	0.0052
Phosphorus P	mg/L	0.183	0.183	0.182	0.183	0.175	0.173	0.174	0.172	0.171	0.170	0.170	0.170
Potassium K	mg/L	25.9	25.9	25.8	25.8	24.7	24.4	24.5	24.2	24.1	24.0	23.9	23.9
Selenium Se	mg/L	0.00042	0.00042	0.00042	0.00044	0.00044	0.00043	0.00044	0.00043	0.00043	0.00043	0.00043	0.00043
Silicon SiO2	mg/L	2.77	2.76	2.76	2.80	2.70	2.68	2.70	2.67	2.65	2.64	2.64	2.64
Silver Ag	mg/L	0.0001021	0.0001019	0.0001016	0.0001075	0.0001055	0.0001048	0.0001054	0.0001043	0.0001035	0.0001033	0.0001030	0.0001029
Sodium Na	mg/L	34	34	34	35	34	33	34	33	33	33	33	33
Strontium Sr	mg/L	0.063	0.063	0.063	0.063	0.061	0.061	0.061	0.061	0.060	0.060	0.060	0.060
Tellurium Te	mg/L	0.032	0.032	0.032	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034
Thallium Tl	mg/L	0.000037	0.000037	0.000037	0.000038	0.000038	0.000037	0.000038	0.000038	0.000037	0.000037	0.000037	0.000037
Thorium Th	mg/L	0.000020	0.000020	0.000020	0.000021	0.000021	0.000021	0.000022	0.000022	0.000022	0.000022	0.000022	0.000022
Tin Sn	mg/L	0.00171	0.00171	0.00170	0.00171	0.00164	0.00162	0.00163	0.00161	0.00160	0.00160	0.00159	0.00159
Titanium Ti	mg/L	0.0045	0.0045	0.0045	0.0048	0.0047	0.0047	0.0048	0.0047	0.0047	0.0047	0.0047	0.0047
Uranium U	mg/L	0.000050	0.000050	0.000050	0.000054	0.000053	0.000053	0.000054	0.000054	0.000053	0.000053	0.000053	0.000053
Vanadium V	mg/L	0.0026	0.0026	0.0026	0.0026	0.0025	0.0025	0.0025	0.0025	0.0024	0.0024	0.0024	0.0024
Zinc Zn	mg/L	0.0152	0.0152	0.0151	0.0151	0.0145	0.0144	0.0145	0.0143	0.0142	0.0142	0.0142	0.0141
Zirconium Zr	mg/L	0.0036	0.0036	0.0036	0.0038	0.0038	0.0038	0.0039	0.0038	0.0038	0.0038	0.0038	0.0038

Table H-7-A-2
Scenario 7

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter													
TDS	mg/L	438	437	436	440	424	421	423	419	416	415	414	414
TSS	mg/L	2.6	2.6	2.6	2.8	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Free CN	mg/L	0.00372	0.00371	0.00370	0.00369	0.00354	0.00351	0.00352	0.00348	0.00346	0.00345	0.00344	0.00344
Total CN	mg/L	0.037	0.037	0.037	0.037	0.036	0.035	0.035	0.035	0.035	0.035	0.035	0.035
WAD CN	mg/L	0.0050	0.0049	0.0049	0.0049	0.0047	0.0047	0.0047	0.0046	0.0046	0.0046	0.0046	0.0046
CNO	mg/L	4.09	4.08	4.07	4.06	3.89	3.86	3.87	3.83	3.80	3.79	3.79	3.78
SCN	mg/L	0.056	0.056	0.056	0.055	0.053	0.053	0.053	0.052	0.052	0.052	0.052	0.052
Sulphate	mg/L	56.0	55.9	55.7	55.7	53.5	53.0	53.2	52.6	52.3	52.1	52.0	51.9
Chloride	mg/L	298	297	297	297	286	284	284	282	280	279	278	278
Total Ammonia	mg/L	0.732	0.730	0.729	0.735	0.710	0.707	0.711	0.705	0.700	0.698	0.697	0.696
Nitrate	mg/L	4.03	4.03	4.02	4.07	3.95	3.93	3.96	3.93	3.90	3.89	3.88	3.88
Nitrite	mg/L	0.539	0.538	0.536	0.536	0.515	0.512	0.513	0.508	0.504	0.503	0.502	0.501
Alkalinity	mg/L	41	41	41	42	41	41	41	41	40	40	40	40
OrthoPhosphate-P	mg/L	0.1102	0.1100	0.1098	0.1095	0.1051	0.1042	0.1044	0.1033	0.1026	0.1024	0.1022	0.1020
Phosphate-P	mg/L	0.1138	0.1136	0.1134	0.1134	0.1089	0.1080	0.1083	0.1071	0.1064	0.1061	0.1059	0.1058
Org. Carbon	mg/L	4.1	4.1	4.1	4.3	4.3	4.3	4.4	4.3	4.3	4.3	4.3	4.3
Hardness CaCO3	mg/L	75	75	74	76	73	73	74	73	72	72	72	72
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Antimony Sb	mg/L	0.0101	0.0101	0.0101	0.0101	0.0096	0.0096	0.0096	0.0095	0.0094	0.0094	0.0094	0.0094
Arsenic As	mg/L	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0017	0.0017	0.0017	0.0017	0.0017
Barium Ba	mg/L	0.0068	0.0068	0.0068	0.0069	0.0066	0.0066	0.0066	0.0065	0.0065	0.0065	0.0065	0.0065
Beryllium Be	mg/L	0.00046	0.00046	0.00045	0.00047	0.00045	0.00045	0.00045	0.00045	0.00044	0.00044	0.00044	0.00044
Bismuth Bi	mg/L	0.00967	0.00965	0.00963	0.00961	0.00921	0.00914	0.00916	0.00906	0.00900	0.00898	0.00896	0.00895
Boron B	mg/L	0.023	0.023	0.023	0.024	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023
Cadmium Cd	mg/L	0.0000375	0.0000374	0.0000373	0.0000380	0.0000369	0.0000368	0.0000371	0.0000368	0.0000366	0.0000365	0.0000364	0.0000363
Calcium Ca	mg/L	142	142	142	142	136	135	135	134	133	133	132	132
Chromium Cr	mg/L	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Cobalt Co	mg/L	0.0060	0.0060	0.0060	0.0060	0.0058	0.0057	0.0057	0.0057	0.0056	0.0056	0.0056	0.0056
Copper Cu	mg/L	0.0057	0.0057	0.0057	0.0057	0.0055	0.0055	0.0055	0.0054	0.0054	0.0054	0.0054	0.0053
Iron Fe	mg/L	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lead Pb	mg/L	0.00029	0.00029	0.00029	0.00030	0.00029	0.00029	0.00029	0.00029	0.00028	0.00028	0.00028	0.00028
Lithium Li	mg/L	0.0041	0.0041	0.0041	0.0043	0.0042	0.0042	0.0042	0.0042	0.0041	0.0041	0.0041	0.0041
Magnesium Mg	mg/L	7.2	7.1	7.1	7.3	7.1	7.1	7.1	7.1	7.0	7.0	7.0	7.0
Manganese Mn	mg/L	0.017	0.017	0.017	0.017	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016
Mercury Hg	mg/L	0.0000039	0.0000039	0.0000039	0.0000040	0.0000039	0.0000039	0.0000039	0.0000039	0.0000038	0.0000038	0.0000038	0.0000038
Molybdenum Mo	mg/L	0.00512	0.00511	0.00510	0.00509	0.00488	0.00484	0.00485	0.00480	0.00477	0.00476	0.00475	0.00474
Nickel Ni	mg/L	0.0052	0.0052	0.0052	0.0052	0.0050	0.0049	0.0050	0.0049	0.0049	0.0049	0.0049	0.0048
Phosphorus P	mg/L	0.169	0.169	0.169	0.169	0.162	0.161	0.162	0.160	0.159	0.158	0.158	0.158
Potassium K	mg/L	23.9	23.8	23.8	23.8	22.8	22.7	22.7	22.5	22.3	22.3	22.2	22.2
Selenium Se	mg/L	0.00043	0.00043	0.00043	0.00045	0.00044	0.00044	0.00044	0.00044	0.00044	0.00043	0.00043	0.00043
Silicon SiO2	mg/L	2.63	2.63	2.62	2.66	2.57	2.56	2.57	2.55	2.53	2.53	2.52	2.52
Silver Ag	mg/L	0.0001027	0.0001025	0.0001023	0.0001076	0.0001058	0.0001052	0.0001057	0.0001048	0.0001040	0.0001038	0.0001036	0.0001034
Sodium Na	mg/L	33	33	33	33	32	32	32	32	32	32	32	32
Strontium Sr	mg/L	0.060	0.060	0.059	0.060	0.058	0.058	0.058	0.058	0.057	0.057	0.057	0.057
Tellurium Te	mg/L	0.034	0.034	0.034	0.036	0.035	0.035	0.036	0.036	0.035	0.035	0.035	0.035
Thallium Tl	mg/L	0.000037	0.000037	0.000037	0.000038	0.000038	0.000038	0.000038	0.000038	0.000037	0.000037	0.000037	0.000037
Thorium Th	mg/L	0.000022	0.000022	0.000022	0.000023	0.000023	0.000023	0.000024	0.000023	0.000023	0.000023	0.000023	0.000023
Tin Sn	mg/L	0.00159	0.00159	0.00158	0.00159	0.00153	0.00152	0.00152	0.00151	0.00150	0.00150	0.00149	0.00149
Titanium Ti	mg/L	0.0047	0.0047	0.0047	0.0049	0.0048	0.0048	0.0049	0.0049	0.0048	0.0048	0.0048	0.0048
Uranium U	mg/L	0.000053	0.000053	0.000053	0.000056	0.000056	0.000056	0.000056	0.000056	0.000056	0.000055	0.000055	0.000055
Vanadium V	mg/L	0.0024	0.0024	0.0024	0.0024	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023
Zinc Zn	mg/L	0.0141	0.0141	0.0141	0.0141	0.0135	0.0134	0.0135	0.0134	0.0133	0.0133	0.0132	0.0132
Zirconium Zr	mg/L	0.0038	0.0038	0.0038	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040	0.0040

Table H-7-A-2
Scenario 7

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter													
TDS	mg/L	413	412	411	466	489	542	601	646	642	642	642	642
TSS	mg/L	2.7	2.7	2.7	2.9	2.8	2.8	2.9	2.9	2.9	2.9	2.9	2.9
Free CN	mg/L	0.00343	0.00343	0.00342	0.00341	0.00320	0.00322	0.00326	0.00323	0.00321	0.00321	0.00321	0.00321
Total CN	mg/L	0.035	0.035	0.034	0.034	0.032	0.033	0.033	0.033	0.032	0.032	0.032	0.032
WAD CN	mg/L	0.0046	0.0046	0.0046	0.0045	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043
CNO	mg/L	3.77	3.77	3.76	3.75	3.52	3.54	3.59	3.55	3.53	3.53	3.53	3.53
SCN	mg/L	0.051	0.051	0.051	0.051	0.048	0.048	0.049	0.048	0.048	0.048	0.048	0.048
Sulphate	mg/L	51.9	51.8	51.7	51.6	48.5	48.8	49.4	49.0	48.6	48.6	48.6	48.6
Chloride	mg/L	278	277	276	310	323	356	392	419	416	416	416	416
Total Ammonia	mg/L	0.695	0.693	0.692	0.690	0.648	0.652	0.661	0.654	0.650	0.650	0.650	0.650
Nitrate	mg/L	3.87	3.86	3.86	3.85	3.61	3.63	3.68	3.64	3.62	3.62	3.62	3.62
Nitrite	mg/L	0.501	0.500	0.499	0.497	0.467	0.469	0.476	0.471	0.468	0.468	0.468	0.468
Alkalinity	mg/L	40	40	40	41	39	39	40	40	39	39	39	39
OrthoPhosphate-P	mg/L	0.1019	0.1017	0.1015	0.1013	0.0951	0.0956	0.0969	0.0960	0.0953	0.0953	0.0953	0.0953
Phosphate-P	mg/L	0.1056	0.1054	0.1052	0.1058	0.0997	0.1003	0.1017	0.1008	0.1001	0.1001	0.1001	0.1001
Org. Carbon	mg/L	4.3	4.3	4.3	4.5	4.4	4.4	4.5	4.5	4.4	4.4	4.4	4.4
Hardness CaCO3	mg/L	72	72	72	73	69	70	71	70	70	70	70	70
Total Metals													
Aluminum Al	mg/L	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Antimony Sb	mg/L	0.0094	0.0093	0.0093	0.0093	0.0087	0.0088	0.0089	0.0088	0.0088	0.0088	0.0088	0.0088
Arsenic As	mg/L	0.0017	0.0017	0.0017	0.0017	0.0016	0.0016	0.0017	0.0017	0.0016	0.0016	0.0016	0.0016
Barium Ba	mg/L	0.0065	0.0064	0.0064	0.0065	0.0061	0.0062	0.0063	0.0062	0.0062	0.0062	0.0062	0.0062
Beryllium Be	mg/L	0.00044	0.00044	0.00044	0.00045	0.00042	0.00042	0.00043	0.00043	0.00042	0.00042	0.00042	0.00042
Bismuth Bi	mg/L	0.00893	0.00892	0.00890	0.00887	0.00833	0.00838	0.00849	0.00841	0.00835	0.00835	0.00835	0.00835
Boron B	mg/L	0.023	0.023	0.023	0.024	0.023	0.023	0.024	0.024	0.024	0.024	0.024	0.024
Cadmium Cd	mg/L	0.0000363	0.0000362	0.0000361	0.0000364	0.0000343	0.0000346	0.0000351	0.0000348	0.0000345	0.0000345	0.0000345	0.0000345
Calcium Ca	mg/L	132	132	131	134	129	133	138	139	138	138	138	138
Chromium Cr	mg/L	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Cobalt Co	mg/L	0.0056	0.0056	0.0056	0.0056	0.0052	0.0052	0.0053	0.0053	0.0052	0.0052	0.0052	0.0052
Copper Cu	mg/L	0.0053	0.0053	0.0053	0.0054	0.0051	0.0051	0.0052	0.0051	0.0051	0.0051	0.0051	0.0051
Iron Fe	mg/L	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Lead Pb	mg/L	0.00028	0.00028	0.00028	0.00028	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027
Lithium Li	mg/L	0.0041	0.0041	0.0041	0.0043	0.0041	0.0042	0.0043	0.0042	0.0042	0.0042	0.0042	0.0042
Magnesium Mg	mg/L	7.0	6.9	6.9	7.2	6.9	6.9	7.1	7.0	7.0	7.0	7.0	7.0
Manganese Mn	mg/L	0.016	0.016	0.016	0.016	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015
Mercury Hg	mg/L	0.0000038	0.0000038	0.0000038	0.0000043	0.0000043	0.0000044	0.0000046	0.0000046	0.0000046	0.0000046	0.0000046	0.0000046
Molybdenum Mo	mg/L	0.00473	0.00472	0.00471	0.00471	0.00443	0.00446	0.00452	0.00447	0.00444	0.00444	0.00444	0.00444
Nickel Ni	mg/L	0.0048	0.0048	0.0048	0.0048	0.0046	0.0046	0.0046	0.0046	0.0046	0.0046	0.0046	0.0046
Phosphorus P	mg/L	0.158	0.157	0.157	0.157	0.148	0.148	0.150	0.149	0.148	0.148	0.148	0.148
Potassium K	mg/L	22.2	22.1	22.1	22.1	20.9	21.0	21.3	21.1	21.0	21.0	21.0	21.0
Selenium Se	mg/L	0.00043	0.00043	0.00043	0.00047	0.00047	0.00047	0.00049	0.00048	0.00048	0.00048	0.00048	0.00048
Silicon SiO2	mg/L	2.51	2.51	2.50	2.55	2.42	2.44	2.48	2.46	2.45	2.45	2.45	2.45
Silver Ag	mg/L	0.0001033	0.0001031	0.0001028	0.0001071	0.0001026	0.0001031	0.0001046	0.0001036	0.0001029	0.0001029	0.0001029	0.0001029
Sodium Na	mg/L	32	32	31	50	65	82	100	116	115	115	115	115
Strontium Sr	mg/L	0.057	0.057	0.057	0.058	0.055	0.056	0.057	0.056	0.056	0.056	0.056	0.056
Tellurium Te	mg/L	0.035	0.035	0.035	0.037	0.036	0.036	0.037	0.037	0.036	0.036	0.036	0.036
Thallium Tl	mg/L	0.000037	0.000037	0.000037	0.000038	0.000036	0.000037	0.000038	0.000037	0.000037	0.000037	0.000037	0.000037
Thorium Th	mg/L	0.000023	0.000023	0.000023	0.000025	0.000024	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025
Tin Sn	mg/L	0.00149	0.00149	0.00148	0.00148	0.00140	0.00141	0.00143	0.00142	0.00141	0.00141	0.00141	0.00141
Titanium Ti	mg/L	0.0048	0.0048	0.0048	0.0054	0.0054	0.0055	0.0057	0.0056	0.0056	0.0056	0.0056	0.0056
Uranium U	mg/L	0.000055	0.000055	0.000055	0.000058	0.000056	0.000057	0.000058	0.000057	0.000057	0.000057	0.000057	0.000057
Vanadium V	mg/L	0.0023	0.0023	0.0023	0.0023	0.0022	0.0022	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023
Zinc Zn	mg/L	0.0132	0.0132	0.0131	0.0132	0.0124	0.0125	0.0127	0.0126	0.0125	0.0125	0.0125	0.0125
Zirconium Zr	mg/L	0.0040	0.0039	0.0039	0.0041	0.0040	0.0040	0.0041	0.0041	0.0041	0.0041	0.0041	0.0041

Table H-7-A-2
Scenario 7

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter													
TDS	mg/L	642	642	642	618	624	613	622	612	612	612	612	612
TSS	mg/L	2.9	2.9	2.9	2.9	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1
Free CN	mg/L	0.00321	0.00321	0.00321	0.00307	0.00308	0.00303	0.00307	0.00302	0.00302	0.00302	0.00302	0.00302
Total CN	mg/L	0.032	0.032	0.032	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031
WAD CN	mg/L	0.0043	0.0043	0.0043	0.0041	0.0041	0.0040	0.0041	0.0040	0.0040	0.0040	0.0040	0.0040
CNO	mg/L	3.53	3.53	3.53	3.37	3.39	3.33	3.37	3.32	3.32	3.32	3.32	3.32
SCN	mg/L	0.048	0.048	0.048	0.046	0.046	0.045	0.046	0.045	0.045	0.045	0.045	0.045
Sulphate	mg/L	48.6	48.6	48.6	46.6	46.9	46.0	46.7	45.9	45.9	45.9	45.9	45.9
Chloride	mg/L	416	416	416	401	405	398	404	398	398	398	398	398
Total Ammonia	mg/L	0.650	0.650	0.650	0.621	0.625	0.614	0.622	0.612	0.612	0.612	0.612	0.612
Nitrate	mg/L	3.62	3.62	3.62	3.46	3.48	3.41	3.46	3.40	3.40	3.40	3.40	3.40
Nitrite	mg/L	0.468	0.468	0.468	0.447	0.450	0.442	0.448	0.440	0.440	0.440	0.440	0.440
Alkalinity	mg/L	39	39	39	39	40	39	40	39	39	39	39	39
OrthoPhosphate-P	mg/L	0.0953	0.0953	0.0953	0.0912	0.0918	0.0901	0.0913	0.0898	0.0898	0.0898	0.0898	0.0898
Phosphate-P	mg/L	0.1001	0.1001	0.1001	0.0965	0.0975	0.0958	0.0972	0.0956	0.0956	0.0956	0.0956	0.0956
Org. Carbon	mg/L	4.4	4.4	4.4	4.5	4.7	4.6	4.7	4.6	4.6	4.6	4.6	4.6
Hardness CaCO3	mg/L	70	70	70	68	69	68	69	68	68	68	68	68
Total Metals													
Aluminum Al	mg/L	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Antimony Sb	mg/L	0.0088	0.0088	0.0088	0.0084	0.0085	0.0083	0.0084	0.0083	0.0083	0.0083	0.0083	0.0083
Arsenic As	mg/L	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016
Barium Ba	mg/L	0.0062	0.0062	0.0062	0.0060	0.0060	0.0059	0.0060	0.0059	0.0059	0.0059	0.0059	0.0059
Beryllium Be	mg/L	0.00042	0.00042	0.00042	0.00041	0.00042	0.00041	0.00042	0.00041	0.00041	0.00041	0.00041	0.00041
Bismuth Bi	mg/L	0.00835	0.00835	0.00835	0.00798	0.00803	0.00788	0.00799	0.00786	0.00786	0.00786	0.00786	0.00786
Boron B	mg/L	0.024	0.024	0.024	0.024	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
Cadmium Cd	mg/L	0.0000345	0.0000345	0.0000345	0.0000334	0.0000337	0.0000332	0.0000337	0.0000331	0.0000331	0.0000331	0.0000331	0.0000331
Calcium Ca	mg/L	138	138	138	133	133	131	133	131	131	131	131	131
Chromium Cr	mg/L	0.004	0.004	0.004	0.003	0.004	0.003	0.004	0.003	0.003	0.003	0.003	0.003
Cobalt Co	mg/L	0.0052	0.0052	0.0052	0.0050	0.0050	0.0050	0.0050	0.0049	0.0049	0.0049	0.0049	0.0049
Copper Cu	mg/L	0.0051	0.0051	0.0051	0.0049	0.0050	0.0049	0.0050	0.0049	0.0049	0.0049	0.0049	0.0049
Iron Fe	mg/L	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Lead Pb	mg/L	0.00027	0.00027	0.00027	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026
Lithium Li	mg/L	0.0042	0.0042	0.0042	0.0042	0.0043	0.0043	0.0044	0.0043	0.0043	0.0043	0.0043	0.0043
Magnesium Mg	mg/L	7.0	7.0	7.0	6.9	7.1	7.0	7.2	7.1	7.1	7.1	7.1	7.1
Manganese Mn	mg/L	0.015	0.015	0.015	0.015	0.015	0.014	0.015	0.015	0.015	0.015	0.015	0.015
Mercury Hg	mg/L	0.0000046	0.0000046	0.0000046	0.0000049	0.0000052	0.0000052	0.0000054	0.0000053	0.0000053	0.0000053	0.0000053	0.0000053
Molybdenum Mo	mg/L	0.00444	0.00444	0.00444	0.00426	0.00429	0.00422	0.00427	0.00420	0.00420	0.00420	0.00420	0.00420
Nickel Ni	mg/L	0.0046	0.0046	0.0046	0.0044	0.0044	0.0044	0.0044	0.0043	0.0043	0.0043	0.0043	0.0043
Phosphorus P	mg/L	0.148	0.148	0.148	0.142	0.143	0.140	0.142	0.140	0.140	0.140	0.140	0.140
Potassium K	mg/L	21.0	21.0	21.0	20.2	20.4	20.0	20.3	20.0	20.0	20.0	20.0	20.0
Selenium Se	mg/L	0.00048	0.00048	0.00048	0.00050	0.00053	0.00052	0.00054	0.00053	0.00053	0.00053	0.00053	0.00053
Silicon SiO2	mg/L	2.45	2.45	2.45	2.39	2.43	2.39	2.44	2.40	2.40	2.40	2.40	2.40
Silver Ag	mg/L	0.0001029	0.0001029	0.0001029	0.0001027	0.0001054	0.0001035	0.0001050	0.0001033	0.0001033	0.0001033	0.0001033	0.0001033
Sodium Na	mg/L	115	115	115	112	113	112	114	112	112	112	112	112
Strontium Sr	mg/L	0.056	0.056	0.056	0.055	0.056	0.055	0.056	0.055	0.055	0.055	0.055	0.055
Tellurium Te	mg/L	0.036	0.036	0.036	0.037	0.038	0.038	0.039	0.038	0.038	0.038	0.038	0.038
Thallium Tl	mg/L	0.000037	0.000037	0.000037	0.000037	0.000038	0.000037	0.000038	0.000037	0.000037	0.000037	0.000037	0.000037
Thorium Th	mg/L	0.000025	0.000025	0.000025	0.000026	0.000027	0.000027	0.000027	0.000027	0.000027	0.000027	0.000027	0.000027
Tin Sn	mg/L	0.00141	0.00141	0.00141	0.00135	0.00136	0.00134	0.00136	0.00134	0.00134	0.00134	0.00134	0.00134
Titanium Ti	mg/L	0.0056	0.0056	0.0056	0.0060	0.0063	0.0063	0.0065	0.0064	0.0064	0.0064	0.0064	0.0064
Uranium U	mg/L	0.000057	0.000057	0.000057	0.000058	0.000059	0.000059	0.000060	0.000059	0.000059	0.000059	0.000059	0.000059
Vanadium V	mg/L	0.0023	0.0023	0.0023	0.0022	0.0023	0.0022	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023
Zinc Zn	mg/L	0.0125	0.0125	0.0125	0.0121	0.0122	0.0120	0.0122	0.0120	0.0120	0.0120	0.0120	0.0120
Zirconium Zr	mg/L	0.0041	0.0041	0.0041	0.0041	0.0042	0.0042	0.0043	0.0042	0.0042	0.0042	0.0042	0.0042

Table H-7-A-2
Scenario 7

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE											
Date		Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter													
TDS	mg/L	612	612	612	589	595	585	594	588	584	584	584	584
TSS	mg/L	3.1	3.1	3.1	3.1	3.2	3.2	3.3	3.3	3.2	3.2	3.2	3.2
Free CN	mg/L	0.00302	0.00302	0.00302	0.00288	0.00290	0.00285	0.00288	0.00286	0.00284	0.00284	0.00284	0.00284
Total CN	mg/L	0.031	0.031	0.031	0.029	0.030	0.029	0.029	0.029	0.029	0.029	0.029	0.029
WAD CN	mg/L	0.0040	0.0040	0.0040	0.0038	0.0039	0.0038	0.0038	0.0038	0.0038	0.0038	0.0038	0.0038
CNO	mg/L	3.32	3.32	3.32	3.17	3.19	3.13	3.17	3.14	3.12	3.12	3.12	3.12
SCN	mg/L	0.045	0.045	0.045	0.043	0.044	0.043	0.043	0.043	0.043	0.043	0.043	0.043
Sulphate	mg/L	45.9	45.9	45.9	44.0	44.3	43.5	44.1	43.6	43.4	43.4	43.4	43.4
Chloride	mg/L	398	398	398	383	388	381	387	383	380	380	380	380
Total Ammonia	mg/L	0.612	0.612	0.612	0.585	0.589	0.578	0.586	0.580	0.576	0.576	0.576	0.576
Nitrate	mg/L	3.40	3.40	3.40	3.25	3.27	3.21	3.26	3.22	3.20	3.20	3.20	3.20
Nitrite	mg/L	0.440	0.440	0.440	0.421	0.424	0.416	0.421	0.417	0.414	0.414	0.414	0.414
Alkalinity	mg/L	39	39	39	38	39	39	39	39	39	39	39	39
OrthoPhosphate-P	mg/L	0.0898	0.0898	0.0898	0.0859	0.0865	0.0849	0.0861	0.0852	0.0846	0.0846	0.0846	0.0846
Phosphate-P	mg/L	0.0956	0.0956	0.0956	0.0922	0.0931	0.0915	0.0928	0.0919	0.0913	0.0913	0.0913	0.0913
Org. Carbon	mg/L	4.6	4.6	4.6	4.7	4.8	4.8	4.9	4.9	4.8	4.8	4.8	4.8
Hardness CaCO3	mg/L	68	68	68	67	68	67	68	68	67	67	67	67
Total Metals													
Aluminum Al	mg/L	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Antimony Sb	mg/L	0.0083	0.0083	0.0083	0.0079	0.0080	0.0078	0.0079	0.0079	0.0078	0.0078	0.0078	0.0078
Arsenic As	mg/L	0.0016	0.0016	0.0016	0.0015	0.0016	0.0015	0.0016	0.0015	0.0015	0.0015	0.0015	0.0015
Barium Ba	mg/L	0.0059	0.0059	0.0059	0.0058	0.0058	0.0057	0.0058	0.0058	0.0057	0.0057	0.0057	0.0057
Beryllium Be	mg/L	0.00041	0.00041	0.00041	0.00040	0.00041	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040
Bismuth Bi	mg/L	0.00786	0.00786	0.00786	0.00751	0.00756	0.00742	0.00752	0.00744	0.00739	0.00739	0.00739	0.00739
Boron B	mg/L	0.025	0.025	0.025	0.025	0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.026
Cadmium Cd	mg/L	0.0000331	0.0000331	0.0000331	0.0000320	0.0000324	0.0000318	0.0000323	0.0000320	0.0000318	0.0000318	0.0000318	0.0000318
Calcium Ca	mg/L	131	131	131	125	126	124	126	124	123	123	123	123
Chromium Cr	mg/L	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Cobalt Co	mg/L	0.0049	0.0049	0.0049	0.0047	0.0048	0.0047	0.0047	0.0047	0.0047	0.0047	0.0047	0.0047
Copper Cu	mg/L	0.0049	0.0049	0.0049	0.0047	0.0048	0.0047	0.0048	0.0047	0.0047	0.0047	0.0047	0.0047
Iron Fe	mg/L	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Lead Pb	mg/L	0.00026	0.00026	0.00026	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025
Lithium Li	mg/L	0.0043	0.0043	0.0043	0.0043	0.0044	0.0044	0.0045	0.0044	0.0044	0.0044	0.0044	0.0044
Magnesium Mg	mg/L	7.1	7.1	7.1	7.0	7.2	7.1	7.2	7.2	7.1	7.1	7.1	7.1
Manganese Mn	mg/L	0.015	0.015	0.015	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014
Mercury Hg	mg/L	0.0000053	0.0000053	0.0000053	0.0000056	0.0000059	0.0000059	0.0000061	0.0000061	0.0000060	0.0000060	0.0000060	0.0000060
Molybdenum Mo	mg/L	0.00420	0.00420	0.00420	0.00403	0.00406	0.00399	0.00404	0.00400	0.00398	0.00398	0.00398	0.00398
Nickel Ni	mg/L	0.0043	0.0043	0.0043	0.0042	0.0042	0.0041	0.0042	0.0042	0.0041	0.0041	0.0041	0.0041
Phosphorus P	mg/L	0.140	0.140	0.140	0.134	0.135	0.132	0.134	0.133	0.132	0.132	0.132	0.132
Potassium K	mg/L	20.0	20.0	20.0	19.2	19.4	19.1	19.3	19.1	19.0	19.0	19.0	19.0
Selenium Se	mg/L	0.00053	0.00053	0.00053	0.00055	0.00057	0.00057	0.00059	0.00058	0.00058	0.00058	0.00058	0.00058
Silicon SiO2	mg/L	2.40	2.40	2.40	2.35	2.38	2.35	2.39	2.37	2.35	2.35	2.35	2.35
Silver Ag	mg/L	0.0001033	0.0001033	0.0001033	0.0001031	0.0001058	0.0001039	0.0001054	0.0001043	0.0001036	0.0001036	0.0001036	0.0001036
Sodium Na	mg/L	112	112	112	109	110	109	110	109	109	109	109	109
Strontium Sr	mg/L	0.055	0.055	0.055	0.054	0.055	0.054	0.055	0.055	0.055	0.055	0.055	0.055
Tellurium Te	mg/L	0.038	0.038	0.038	0.038	0.040	0.039	0.040	0.040	0.040	0.040	0.040	0.040
Thallium Tl	mg/L	0.000037	0.000037	0.000037	0.000037	0.000038	0.000037	0.000038	0.000038	0.000037	0.000037	0.000037	0.000037
Thorium Th	mg/L	0.000027	0.000027	0.000027	0.000028	0.000029	0.000029	0.000029	0.000029	0.000029	0.000029	0.000029	0.000029
Tin Sn	mg/L	0.00134	0.00134	0.00134	0.00129	0.00130	0.00128	0.00130	0.00128	0.00128	0.00128	0.00128	0.00128
Titanium Ti	mg/L	0.0064	0.0064	0.0064	0.0068	0.0071	0.0071	0.0073	0.0072	0.0072	0.0072	0.0072	0.0072
Uranium U	mg/L	0.000059	0.000059	0.000059	0.000059	0.000061	0.000060	0.000062	0.000061	0.000061	0.000061	0.000061	0.000061
Vanadium V	mg/L	0.0023	0.0023	0.0023	0.0022	0.0023	0.0022	0.0023	0.0023	0.0022	0.0022	0.0022	0.0022
Zinc Zn	mg/L	0.0120	0.0120	0.0120	0.0115	0.0116	0.0114	0.0117	0.0116	0.0115	0.0115	0.0115	0.0115
Zirconium Zr	mg/L	0.0042	0.0042	0.0042	0.0042	0.0044	0.0043	0.0044	0.0044	0.0043	0.0043	0.0043	0.0043

Table H-7-A-2
Scenario 7

Water Quality in TAIL LAKE		Water Quality in TAIL LAKE										
Date		Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16
Parameter												
TDS	mg/L	584	584	584	567	575	565	574	565	565	565	565
TSS	mg/L	3.2	3.2	3.2	3.5	3.7	3.6	3.8	3.7	3.7	3.7	3.7
Free CN	mg/L	0.00284	0.00284	0.00284	0.00271	0.00273	0.00268	0.00271	0.00267	0.00267	0.00267	0.00267
Total CN	mg/L	0.029	0.029	0.029	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028
WAD CN	mg/L	0.0038	0.0038	0.0038	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036	0.0036
CNO	mg/L	3.12	3.12	3.12	2.98	3.00	2.95	2.99	2.94	2.94	2.94	2.94
SCN	mg/L	0.043	0.043	0.043	0.041	0.041	0.040	0.041	0.040	0.040	0.040	0.040
Sulphate	mg/L	43.4	43.4	43.4	41.6	41.9	41.2	41.8	41.1	41.1	41.1	41.1
Chloride	mg/L	380	380	380	370	375	369	375	370	370	370	370
Total Ammonia	mg/L	0.576	0.576	0.576	0.551	0.555	0.544	0.552	0.543	0.543	0.543	0.543
Nitrate	mg/L	3.20	3.20	3.20	3.06	3.08	3.02	3.06	3.01	3.01	3.01	3.01
Nitrite	mg/L	0.414	0.414	0.414	0.396	0.399	0.391	0.397	0.390	0.390	0.390	0.390
Alkalinity	mg/L	39	39	39	39	40	40	41	40	40	40	40
OrthoPhosphate-P	mg/L	0.0846	0.0846	0.0846	0.0811	0.0816	0.0801	0.0812	0.0799	0.0799	0.0799	0.0799
Phosphate-P	mg/L	0.0913	0.0913	0.0913	0.0889	0.0901	0.0886	0.0900	0.0886	0.0886	0.0886	0.0886
Org. Carbon	mg/L	4.8	4.8	4.8	5.1	5.4	5.3	5.5	5.4	5.4	5.4	5.4
Hardness CaCO3	mg/L	67	67	67	67	69	68	69	68	68	68	68
Total Metals												
Aluminum Al	mg/L	0.07	0.07	0.07	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Antimony Sb	mg/L	0.0078	0.0078	0.0078	0.0075	0.0075	0.0074	0.0075	0.0074	0.0074	0.0074	0.0074
Arsenic As	mg/L	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Barium Ba	mg/L	0.0057	0.0057	0.0057	0.0056	0.0057	0.0056	0.0057	0.0057	0.0057	0.0057	0.0057
Beryllium Be	mg/L	0.00040	0.00040	0.00040	0.00040	0.00041	0.00040	0.00040	0.00040	0.00040	0.00040	0.00040
Bismuth Bi	mg/L	0.00739	0.00739	0.00739	0.00707	0.00711	0.00698	0.00708	0.00696	0.00696	0.00696	0.00696
Boron B	mg/L	0.026	0.026	0.026	0.027	0.029	0.028	0.029	0.029	0.029	0.029	0.029
Cadmium Cd	mg/L	0.0000318	0.0000318	0.0000318	0.0000310	0.0000315	0.0000311	0.0000316	0.0000311	0.0000311	0.0000311	0.0000311
Calcium Ca	mg/L	123	123	123	119	120	117	119	117	117	117	117
Chromium Cr	mg/L	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Cobalt Co	mg/L	0.0047	0.0047	0.0047	0.0045	0.0045	0.0044	0.0045	0.0044	0.0044	0.0044	0.0044
Copper Cu	mg/L	0.0047	0.0047	0.0047	0.0046	0.0047	0.0046	0.0047	0.0046	0.0046	0.0046	0.0046
Iron Fe	mg/L	0.08	0.08	0.08	0.09	0.10	0.10	0.11	0.11	0.11	0.11	0.11
Lead Pb	mg/L	0.00025	0.00025	0.00025	0.00024	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025
Lithium Li	mg/L	0.0044	0.0044	0.0044	0.0046	0.0048	0.0048	0.0049	0.0048	0.0048	0.0048	0.0048
Magnesium Mg	mg/L	7.1	7.1	7.1	7.3	7.6	7.5	7.7	7.6	7.6	7.6	7.6
Manganese Mn	mg/L	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014
Mercury Hg	mg/L	0.0000060	0.0000060	0.0000060	0.0000068	0.0000073	0.0000073	0.0000076	0.0000075	0.0000075	0.0000075	0.0000075
Molybdenum Mo	mg/L	0.00398	0.00398	0.00398	0.00383	0.00386	0.00379	0.00385	0.00378	0.00378	0.00378	0.00378
Nickel Ni	mg/L	0.0041	0.0041	0.0041	0.0040	0.0041	0.0040	0.0041	0.0040	0.0040	0.0040	0.0040
Phosphorus P	mg/L	0.132	0.132	0.132	0.127	0.128	0.125	0.127	0.125	0.125	0.125	0.125
Potassium K	mg/L	19.0	19.0	19.0	18.4	18.7	18.4	18.7	18.4	18.4	18.4	18.4
Selenium Se	mg/L	0.00058	0.00058	0.00058	0.00063	0.00067	0.00067	0.00070	0.00069	0.00069	0.00069	0.00069
Silicon SiO2	mg/L	2.35	2.35	2.35	2.35	2.41	2.38	2.43	2.39	2.39	2.39	2.39
Silver Ag	mg/L	0.0001036	0.0001036	0.0001036	0.0001072	0.0001117	0.0001097	0.0001113	0.0001095	0.0001095	0.0001095	0.0001095
Sodium Na	mg/L	109	109	109	107	110	108	110	109	109	109	109
Strontium Sr	mg/L	0.055	0.055	0.055	0.055	0.056	0.056	0.057	0.056	0.056	0.056	0.056
Tellurium Te	mg/L	0.040	0.040	0.040	0.042	0.044	0.043	0.045	0.044	0.044	0.044	0.044
Thallium Tl	mg/L	0.000037	0.000037	0.000037	0.000038	0.000039	0.000039	0.000040	0.000039	0.000039	0.000039	0.000039
Thorium Th	mg/L	0.000029	0.000029	0.000029	0.000031	0.000033	0.000033	0.000034	0.000034	0.000034	0.000034	0.000034
Tin Sn	mg/L	0.00128	0.00128	0.00128	0.00123	0.00125	0.00123	0.00125	0.00123	0.00123	0.00123	0.00123
Titanium Ti	mg/L	0.0072	0.0072	0.0072	0.0080	0.0086	0.0086	0.0089	0.0089	0.0089	0.0089	0.0089
Uranium U	mg/L	0.000061	0.000061	0.000061	0.000064	0.000067	0.000067	0.000068	0.000067	0.000067	0.000067	0.000067
Vanadium V	mg/L	0.0022	0.0022	0.0022	0.0023	0.0024	0.0023	0.0024	0.0024	0.0024	0.0024	0.0024
Zinc Zn	mg/L	0.0115	0.0115	0.0115	0.0111	0.0112	0.0111	0.0113	0.0112	0.0112	0.0112	0.0112
Zirconium Zr	mg/L	0.0043	0.0043	0.0043	0.0045	0.0047	0.0047	0.0048	0.0048	0.0048	0.0048	0.0048

Table H 7-A-3
Scenario 7

Loadings to Tail Lake (kg/month)												
Date	Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter												
TDS	81148	78530	81148	150703	117270	90424	92405	84787	78530	81148	81148	73295
TSS	183	177	183	2146	1086	462	524	274	177	183	183	166
Free CN	1.10	1.06	1.10	1.06	1.10	1.10	1.06	1.10	1.06	1.10	1.10	0.99
Total CN	11	10	11	12	11	11	11	11	10	11	11	10
WAD CN	1.47	1.42	1.47	1.42	1.47	1.47	1.42	1.47	1.42	1.47	1.47	1.32
CNO	1210	1171	1210	1171	1210	1210	1171	1210	1171	1210	1210	1093
SCN	16	16	16	16	16	16	16	16	16	16	16	15
Sulphate	14302	13840	14302	18918	17414	15481	15443	14832	13840	14302	14302	12918
Chloride	49110	47526	49110	91129	76393	58686	60024	53101	47526	49110	49110	44357
Total Ammonia	149	145	149	289	239	187	195	167	145	149	149	135
Nitrate	758	733	758	1857	1454	1051	1108	889	733	758	758	684
Nitrite	116	112	116	139	133	123	121	119	112	116	116	105
Alkalinity	6928	6704	6928	23107	16259	9432	9595	7686	6704	6928	6928	6257
OrthoPhosphate-P	21	21	21	22	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	26	23	22	21	21	21	21	21	19
Org. Carbon				3936.71	2107.15	556.60	578.13	151.66				
Hardness CaCO3	14992	14508	14992	36160	27936	18424	18902	16144	14508	14992	14992	13541
Total Metals												
Aluminum Al	4.47	4.33	4.47	24.30	13.63	11.10	9.94	6.21	4.33	4.47	4.47	4.04
Antimony Sb	1.32	1.28	1.32	4.71	3.47	2.25	2.47	1.73	1.28	1.32	1.32	1.19
Arsenic As	0.39	0.38	0.39	0.75	0.63	0.48	0.49	0.43	0.38	0.39	0.39	0.36
Barium Ba	1.56	1.51	1.56	2.79	2.26	1.87	1.84	1.66	1.51	1.56	1.56	1.41
Beryllium Be	0.05	0.05	0.05	0.29	0.18	0.08	0.09	0.06	0.05	0.05	0.05	0.04
Bismuth Bi	1.23	1.19	1.23	4.56	3.31	2.11	2.31	1.62	1.19	1.23	1.23	1.11
Boron B	2.80	2.71	2.80	13.93	9.39	5.14	5.42	3.61	2.71	2.80	2.80	2.53
Cadmium Cd	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Calcium Ca	40484	39178	40484	43723	42947	41449	40324	40818	39178	40484	40484	36566
Chromium Cr	1.02	0.99	1.02	1.43	1.37	1.15	1.07	1.05	0.99	1.02	1.02	0.92
Cobalt Co	1.67	1.62	1.67	1.88	1.83	1.73	1.70	1.70	1.62	1.67	1.67	1.51
Copper Cu	1.46	1.41	1.46	2.11	1.83	1.55	1.53	1.49	1.41	1.46	1.46	1.32
Iron Fe	4.63	4.48	4.63	34.23	16.22	12.50	12.63	6.83	4.48	4.63	4.63	4.18
Lead Pb	0.05	0.05	0.05	0.15	0.11	0.07	0.07	0.06	0.05	0.05	0.05	0.04
Lithium Li	0.46	0.45	0.46	2.86	1.60	0.83	0.90	0.59	0.45	0.46	0.46	0.42
Magnesium Mg	1082	1047	1082	4100	2705	1678	1692	1262	1047	1082	1082	977
Manganese Mn	4.56	4.41	4.56	5.41	5.07	4.90	4.89	4.70	4.41	4.56	4.56	4.12
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	1.48	1.43	1.48	1.53	1.53	1.49	1.45	1.48	1.43	1.48	1.48	1.34
Nickel Ni	1.26	1.22	1.26	1.93	1.65	1.40	1.39	1.31	1.22	1.26	1.26	1.14
Phosphorus P	33	32	33	48	41	36	36	35	32	33	33	30
Potassium K	6696	6480	6696	7597	7267	6853	6723	6762	6480	6696	6696	6048
Selenium Se	0.04	0.04	0.04	0.33	0.18	0.08	0.08	0.05	0.04	0.04	0.04	0.03
Silicon SiO2	556	538	556	1235	893	667	678	596	538	556	556	502
Silver Ag	0.01	0.01	0.01	0.09	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sodium Na	6353	6148	6353	16493	12040	8044	8267	6910	6148	6353	6353	5739
Strontium Sr	12	12	12	27	21	15	16	13	12	12	12	11
Tellurium Te	0.02	0.02	0.02	32.86	15.09	4.67	5.81	1.54	0.02	0.02	0.02	0.02
Thallium Tl	0.00	0.00	0.00	0.03	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.02	0.01	0.00	0.01	0.00				
Tin Sn	0.18	0.18	0.18	0.77	0.60	0.35	0.39	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.10	0.09	0.10	4.23	2.03	0.71	0.85	0.30	0.09	0.10	0.10	0.09
Uranium U	0.00	0.00	0.00	0.05	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.36	0.35	0.36	1.23	0.86	0.53	0.54	0.43	0.35	0.36	0.36	0.33
Zinc Zn	3.5	3.4	3.5	4.7	4.2	3.9	4.6	3.8	3.4	3.5	3.5	3.2
Zirconium Zr				3.61	1.71	0.55	0.69	0.19				

Table H 7-A-3
Scenario 7

Loadings to Tail Lake (kg/month)												
Date	Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter												
TDS	81148	78530	81148	115080	99822	85977	85770	83053	78530	81148	81148	73295
TSS	183	177	183	1174	650	328	358	231	177	183	183	166
Free CN	1.10	1.06	1.10	1.06	1.10	1.10	1.06	1.10	1.06	1.10	1.10	0.99
Total CN	11	10	11	11	11	11	10	11	10	11	11	10
WAD CN	1.47	1.42	1.47	1.42	1.47	1.47	1.42	1.47	1.42	1.47	1.47	1.32
CNO	1210	1171	1210	1171	1210	1210	1171	1210	1171	1210	1210	1093
SCN	16	16	16	16	16	16	16	16	16	16	16	15
Sulphate	14302	13840	14302	18280	17044	15390	15282	14790	13840	14302	14302	12918
Chloride	49110	47526	49110	81737	70577	57174	57979	52566	47526	49110	49110	44357
Total Ammonia	149	145	149	288	238	187	194	166	145	149	149	135
Nitrate	758	733	758	1855	1453	1051	1108	888	733	758	758	684
Nitrite	116	112	116	139	132	123	121	119	112	116	116	105
Alkalinity	6928	6704	6928	15011	11752	8232	8213	7325	6704	6928	6928	6257
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	24	22	22	21	21	21	21	21	19
Org. Carbon				1993.64	1089.31	289.74	301.68	79.38				
Hardness CaCO3	14992	14508	14992	25473	21683	16779	16801	15595	14508	14992	14992	13541
Total Metals												
Aluminum Al	4.47	4.33	4.47	18.95	11.95	9.07	8.72	5.89	4.33	4.47	4.47	4.04
Antimony Sb	1.32	1.28	1.32	4.67	3.44	2.22	2.44	1.72	1.28	1.32	1.32	1.19
Arsenic As	0.39	0.38	0.39	0.69	0.59	0.47	0.47	0.43	0.38	0.39	0.39	0.36
Barium Ba	1.56	1.51	1.56	2.25	1.98	1.74	1.72	1.62	1.51	1.56	1.56	1.41
Beryllium Be	0.05	0.05	0.05	0.23	0.15	0.08	0.09	0.06	0.05	0.05	0.05	0.04
Bismuth Bi	1.23	1.19	1.23	4.55	3.31	2.10	2.31	1.62	1.19	1.23	1.23	1.11
Boron B	2.80	2.71	2.80	10.05	7.21	4.44	4.66	3.41	2.71	2.80	2.80	2.53
Cadmium Cd	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Calcium Ca	40484	39178	40484	42045	42100	41130	39959	40723	39178	40484	40484	36566
Chromium Cr	1.02	0.99	1.02	1.31	1.26	1.11	1.06	1.04	0.99	1.02	1.02	0.92
Cobalt Co	1.67	1.62	1.67	1.85	1.81	1.73	1.69	1.70	1.62	1.67	1.67	1.51
Copper Cu	1.46	1.41	1.46	1.82	1.68	1.52	1.49	1.48	1.41	1.46	1.46	1.32
Iron Fe	4.63	4.48	4.63	20.62	11.28	9.00	9.08	5.91	4.48	4.63	4.63	4.18
Lead Pb	0.05	0.05	0.05	0.13	0.10	0.07	0.07	0.06	0.05	0.05	0.05	0.04
Lithium Li	0.46	0.45	0.46	1.77	1.11	0.68	0.72	0.54	0.45	0.46	0.46	0.42
Magnesium Mg	1082	1047	1082	2778	2034	1439	1443	1197	1047	1082	1082	977
Manganese Mn	4.56	4.41	4.56	5.15	4.96	4.79	4.74	4.66	4.41	4.56	4.56	4.12
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	1.48	1.43	1.48	1.50	1.52	1.49	1.45	1.48	1.43	1.48	1.48	1.34
Nickel Ni	1.26	1.22	1.26	1.76	1.57	1.38	1.36	1.31	1.22	1.26	1.26	1.14
Phosphorus P	33	32	33	45	40	36	36	35	32	33	33	30
Potassium K	6696	6480	6696	7085	7015	6788	6620	6735	6480	6696	6696	6048
Selenium Se	0.04	0.04	0.04	0.20	0.12	0.06	0.07	0.05	0.04	0.04	0.04	0.03
Silicon SiO2	556	538	556	944	762	627	628	583	538	556	556	502
Silver Ag	0.01	0.01	0.01	0.06	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Sodium Na	6353	6148	6353	11409	9306	7239	7261	6647	6148	6353	6353	5739
Strontium Sr	12	12	12	20	17	14	14	13	12	12	12	11
Tellurium Te	0.02	0.02	0.02	16.66	7.82	2.44	3.05	0.82	0.02	0.02	0.02	0.02
Thallium Tl	0.00	0.00	0.00	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.02	0.01	0.00	0.01	0.00				
Tin Sn	0.18	0.18	0.18	0.74	0.56	0.33	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.10	0.09	0.10	2.29	1.15	0.44	0.52	0.22	0.09	0.10	0.10	0.09
Uranium U	0.00	0.00	0.00	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.36	0.35	0.36	1.08	0.79	0.52	0.54	0.43	0.35	0.36	0.36	0.33
Zinc Zn	3.5	3.4	3.5	4.4	4.1	3.8	4.1	3.7	3.4	3.5	3.5	3.2
Zirconium Zr				1.99	0.98	0.33	0.41	0.12				

Table H 7-A-3
Scenario 7

Loadings to Tail Lake (kg/month)												
Date	Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter												
TDS	50662	49028	50662	84845	68991	55405	56142	52535	49028	50662	50662	45759
TSS				977	458	142	178	47				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate	1289	1247	1289	5573	3962	2349	2652	1765	1247	1289	1289	1164
Chloride	49110	47526	49110	81544	70462	57145	57940	52556	47526	49110	49110	44357
Total Ammonia	25	24	25	153	104	58	68	40	24	25	25	22
Nitrate	29	28	29	1036	654	292	365	147	28	29	29	26
Nitrite	64	62	64	86	79	71	70	67	62	64	64	58
Alkalinity				8140	4735	1281	1482	390				
OrthoPhosphate-P	21	21	21	21	22	21	21	21	21	21	21	19
Phosphate-P	21	21	21	24	22	22	21	21	21	21	21	19
Org. Carbon				1953.66	1069.17	284.58	296.43	78.04				
Hardness CaCO3				10745	6568	1755	2253	593				
Total Metals												
Aluminum Al	0.81	0.78	0.81	12.35	6.42	4.59	4.16	1.87	0.78	0.81	0.81	0.73
Antimony Sb	1.21	1.17	1.21	4.55	3.32	2.11	2.32	1.61	1.17	1.21	1.21	1.09
Arsenic As	0.03	0.03	0.03	0.26	0.18	0.08	0.10	0.05	0.03	0.03	0.03	0.02
Barium Ba	0.06	0.06	0.06	0.78	0.47	0.24	0.26	0.12	0.06	0.06	0.06	0.05
Beryllium Be	0.03	0.03	0.03	0.20	0.12	0.06	0.06	0.04	0.03	0.03	0.03	0.03
Bismuth Bi	1.21	1.17	1.21	4.52	3.28	2.08	2.29	1.60	1.17	1.21	1.21	1.09
Boron B	0.60	0.58	0.60	7.15	4.54	2.05	2.29	1.13	0.58	0.60	0.60	0.55
Cadmium Cd	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Calcium Ca	263	254	263	2914	1755	857	970	479	254	263	263	237
Chromium Cr	0.07	0.06	0.07	0.37	0.29	0.15	0.13	0.09	0.06	0.07	0.07	0.06
Cobalt Co	0.06	0.06	0.06	0.28	0.19	0.11	0.13	0.08	0.06	0.06	0.06	0.05
Copper Cu	0.03	0.03	0.03	0.41	0.24	0.09	0.10	0.05	0.03	0.03	0.03	0.03
Iron Fe	0.23	0.23	0.23	15.40	6.36	4.35	4.53	1.41	0.23	0.23	0.23	0.21
Lead Pb	0.01	0.01	0.01	0.08	0.05	0.03	0.03	0.02	0.01	0.01	0.01	0.01
Lithium Li	0.06	0.06	0.06	1.34	0.69	0.27	0.32	0.13	0.06	0.06	0.06	0.05
Magnesium Mg	121	117	121	1804	1049	470	504	233	117	121	121	110
Manganese Mn	0.16	0.15	0.16	0.88	0.55	0.39	0.47	0.26	0.15	0.16	0.16	0.14
Mercury Hg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molybdenum Mo	0.01	0.01	0.01	0.08	0.05	0.02	0.03	0.02	0.01	0.01	0.01	0.01
Nickel Ni	0.12	0.12	0.12	0.64	0.42	0.24	0.26	0.17	0.12	0.12	0.12	0.11
Phosphorus P	23	22	23	33	29	25	25	24	22	23	23	21
Potassium K	25	24	25	614	336	114	161	63	24	25	25	23
Selenium Se	0.00	0.00	0.00	0.15	0.07	0.02	0.03	0.01	0.00	0.00	0.00	0.00
Silicon SiO2	10	9	10	377	193	72	88	32	9	10	10	9
Silver Ag	0.00	0.00	0.00	0.05	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Sodium Na	12	12	12	5163	2908	881	1104	301	12	12	12	11
Strontium Sr	0	0	0	8	5	2	2	1	0	0	0	0
Tellurium Te				16.30	7.65	2.38	2.97	0.78				
Thallium Tl	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn	0.18	0.18	0.18	0.73	0.55	0.33	0.37	0.25	0.18	0.18	0.18	0.16
Titanium Ti	0.06	0.06	0.06	2.20	1.09	0.39	0.48	0.18	0.06	0.06	0.06	0.05
Uranium U	0.00	0.00	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vanadium V	0.18	0.18	0.18	0.87	0.59	0.33	0.36	0.24	0.18	0.18	0.18	0.16
Zinc Zn	0.2	0.2	0.2	1.1	0.8	0.5	0.9	0.4	0.2	0.2	0.2	0.2
Zirconium Zr				1.83	0.89	0.29	0.36	0.10				

Table H 7-A-3
Scenario 7

Loadings to Tail Lake (kg/month)												
Date	Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter												
TDS				35406	18127	4692	7039	1853				
TSS				966	453	141	176	46				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				781	475	135	220	62				
Chloride				9334	6042	1595	2170	571				
Total Ammonia				61	37	16	21	7				
Nitrate				470	291	122	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				8047	4683	1267	1466	386				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1931.25	1057.38	281.52	293.30	77.23				
Hardness CaCO3				10622	6495	1736	2229	587				
Total Metals												
Aluminum Al				9.60	4.41	3.26	2.73	0.84				
Antimony Sb				0.06	0.05	0.03	0.05	0.01				
Arsenic As				0.16	0.10	0.04	0.04	0.01				
Barium Ba				0.55	0.30	0.13	0.14	0.04				
Beryllium Be				0.08	0.04	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				4.86	2.89	1.00	1.14	0.33				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				1919	1035	402	471	131				
Chromium Cr				0.14	0.12	0.05	0.01	0.00				
Cobalt Co				0.05	0.03	0.01	0.01	0.00				
Copper Cu				0.32	0.17	0.04	0.05	0.01				
Iron Fe				14.52	5.76	3.95	4.09	1.11				
Lead Pb				0.04	0.02	0.01	0.01	0.00				
Lithium Li				1.10	0.52	0.16	0.20	0.05				
Magnesium Mg				1339	714	259	272	72				
Manganese Mn				0.28	0.12	0.11	0.17	0.05				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.19	0.09	0.03	0.03	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				515	265	70	112	30				
Selenium Se				0.15	0.07	0.02	0.03	0.01				
Silicon SiO2				337	165	55	69	19				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				5060	2844	851	1070	282				
Strontium Sr				7	4	1	2	0				
Tellurium Te				16.11	7.56	2.35	2.94	0.77				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.05	0.06	0.02	0.02	0.01				
Titanium Ti				1.95	0.92	0.29	0.36	0.09				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.19	0.10	0.02	0.01	0.00				
Zinc Zn				0.4	0.2	0.1	0.5	0.1				
Zirconium Zr				1.81	0.88	0.29	0.36	0.10				

Table H 7-A-3
Scenario 7

Loadings to Tail Lake (kg/month)												
Date	Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter												
TDS				35064	17953	4647	6972	1836				
TSS				956	449	139	174	46				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				775	471	134	218	62				
Chloride				9244	5984	1580	2150	566				
Total Ammonia				61	37	16	21	7				
Nitrate				469	291	122	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				7969	4638	1255	1453	382				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1912.61	1047.23	278.83	290.50	76.49				
Hardness CaCO3				10519	6433	1719	2208	581				
Total Metals												
Aluminum Al				9.55	4.39	3.24	2.72	0.84				
Antimony Sb				0.06	0.05	0.03	0.04	0.01				
Arsenic As				0.16	0.10	0.04	0.04	0.01				
Barium Ba				0.54	0.30	0.13	0.14	0.04				
Beryllium Be				0.08	0.04	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				4.83	2.86	1.00	1.13	0.33				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				1903	1027	399	467	130				
Chromium Cr				0.14	0.12	0.04	0.01	0.00				
Cobalt Co				0.05	0.03	0.01	0.01	0.00				
Copper Cu				0.31	0.17	0.04	0.05	0.01				
Iron Fe				14.39	5.71	3.91	4.06	1.10				
Lead Pb				0.04	0.02	0.01	0.01	0.00				
Lithium Li				1.09	0.52	0.16	0.20	0.05				
Magnesium Mg				1326	707	256	269	72				
Manganese Mn				0.28	0.12	0.11	0.17	0.04				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.19	0.09	0.03	0.03	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				510	263	70	111	29				
Selenium Se				0.15	0.07	0.02	0.03	0.01				
Silicon SiO2				334	164	54	68	19				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				5011	2816	843	1060	279				
Strontium Sr				7	4	1	2	0				
Tellurium Te				15.96	7.49	2.33	2.91	0.77				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.05	0.06	0.02	0.02	0.01				
Titanium Ti				1.93	0.91	0.28	0.36	0.09				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.19	0.10	0.02	0.01	0.00				
Zinc Zn				0.4	0.2	0.1	0.5	0.1				
Zirconium Zr				1.79	0.87	0.28	0.36	0.10				

Table H 7-A-3
Scenario 7

Loadings to Tail Lake (kg/month)												
Date	Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter												
TDS				34727	17778	4602	6905	1818				
TSS				947	444	138	173	45				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				769	467	133	217	61				
Chloride				9155	5926	1565	2129	561				
Total Ammonia				61	37	16	21	7				
Nitrate				469	291	122	157	55				
Nitrite				11	7	3	4	1				
Alkalinity				7892	4593	1243	1439	379				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				3	1	0	0	0				
Org. Carbon				1894.18	1037.06	276.13	287.70	75.75				
Hardness CaCO3				10418	6371	1703	2187	576				
Total Metals												
Aluminum Al				9.49	4.38	3.22	2.71	0.84				
Antimony Sb				0.06	0.05	0.03	0.04	0.01				
Arsenic As				0.16	0.10	0.04	0.04	0.01				
Barium Ba				0.54	0.29	0.13	0.14	0.04				
Beryllium Be				0.08	0.04	0.01	0.01	0.00				
Bismuth Bi				0.03	0.02	0.01	0.01	0.00				
Boron B				4.79	2.84	0.99	1.12	0.32				
Cadmium Cd				0.01	0.00	0.00	0.00	0.00				
Calcium Ca				1887	1018	396	463	129				
Chromium Cr				0.14	0.12	0.04	0.01	0.00				
Cobalt Co				0.05	0.03	0.01	0.01	0.00				
Copper Cu				0.31	0.16	0.04	0.05	0.01				
Iron Fe				14.26	5.66	3.88	4.02	1.09				
Lead Pb				0.04	0.02	0.01	0.01	0.00				
Lithium Li				1.08	0.51	0.16	0.20	0.05				
Magnesium Mg				1313	700	254	267	71				
Manganese Mn				0.28	0.12	0.11	0.17	0.04				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.03	0.02	0.00	0.00	0.00				
Nickel Ni				0.19	0.09	0.03	0.03	0.01				
Phosphorus P				6	3	1	1	0				
Potassium K				505	260	69	110	29				
Selenium Se				0.15	0.07	0.02	0.02	0.01				
Silicon SiO2				332	163	54	68	19				
Silver Ag				0.04	0.02	0.00	0.00	0.00				
Sodium Na				4963	2789	835	1049	276				
Strontium Sr				7	4	1	2	0				
Tellurium Te				15.80	7.42	2.31	2.88	0.76				
Thallium Tl				0.01	0.01	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.05	0.06	0.02	0.02	0.01				
Titanium Ti				1.91	0.90	0.28	0.35	0.09				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.19	0.09	0.02	0.01	0.00				
Zinc Zn				0.4	0.2	0.1	0.5	0.1				
Zirconium Zr				1.78	0.86	0.28	0.35	0.10				

Table H 7-A-3
Scenario 7

Loadings to Tail Lake (kg/month)												
Date	Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter												
TDS				412597	395813	382784	385081	380021				
TSS				1520	713	222	278	73				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				616	373	94	167	44				
Chloride				255243	243666	234255	235401	231711				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				7815	4547	1234	1431	377				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				7	3	1	1	0				
Org. Carbon				1875.53	1026.68	274.26	286.21	75.35				
Hardness CaCO3				10315	6307	1691	2175	573				
Total Metals												
Aluminum Al				55.65	25.39	9.47	10.51	2.77				
Antimony Sb				0.05	0.04	0.03	0.04	0.01				
Arsenic As				0.15	0.08	0.02	0.03	0.01				
Barium Ba				0.52	0.28	0.12	0.13	0.03				
Beryllium Be				0.06	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.01	0.00	0.00	0.00				
Boron B				10.05	5.16	1.64	1.94	0.51				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				24373	23353	22673	22740	22397				
Chromium Cr				0.22	0.16	0.05	0.02	0.01				
Cobalt Co				0.06	0.03	0.01	0.01	0.00				
Copper Cu				0.44	0.22	0.06	0.07	0.02				
Iron Fe				62.21	28.02	10.77	12.66	3.33				
Lead Pb				0.03	0.01	0.00	0.00	0.00				
Lithium Li				1.52	0.71	0.22	0.28	0.07				
Magnesium Mg				1945	992	343	380	100				
Manganese Mn				1.42	0.65	0.28	0.37	0.10				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.10	0.05	0.01	0.02	0.00				
Nickel Ni				0.21	0.10	0.03	0.03	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				1020	500	144	203	54				
Selenium Se				0.33	0.16	0.05	0.06	0.01				
Silicon SiO2				404	190	59	74	19				
Silver Ag				0.03	0.02	0.00	0.00	0.00				
Sodium Na				139824	132699	127743	128303	126271				
Strontium Sr				10	5	2	2	1				
Tellurium Te				15.63	7.33	2.29	2.86	0.75				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.04	0.05	0.01	0.02	0.00				
Titanium Ti				4.74	2.22	0.69	0.87	0.23				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.57	0.27	0.07	0.08	0.02				
Zinc Zn				0.5	0.2	0.1	0.5	0.1				
Zirconium Zr				1.58	0.74	0.23	0.29	0.08				

Table H 7-A-3
Scenario 7

Loadings to Tail Lake (kg/month)												
Date	Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter												
TDS				34267	17647	4568	6865	1807				
TSS				1515	715	222	278	73				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				614	374	94	166	44				
Chloride				24765	13308	3860	5005	1318				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				7788	4559	1233	1430	377				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				7	3	1	1	0				
Org. Carbon				1869.12	1029.39	274.09	286.03	75.31				
Hardness CaCO3				10280	6323	1690	2174	572				
Total Metals												
Aluminum Al				55.46	25.46	9.47	10.50	2.77				
Antimony Sb				0.05	0.04	0.03	0.04	0.01				
Arsenic As				0.15	0.08	0.02	0.03	0.01				
Barium Ba				0.52	0.28	0.12	0.13	0.03				
Beryllium Be				0.06	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.01	0.00	0.00	0.00				
Boron B				10.01	5.17	1.64	1.94	0.51				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				2091	1081	398	465	122				
Chromium Cr				0.21	0.16	0.05	0.02	0.01				
Cobalt Co				0.06	0.03	0.01	0.01	0.00				
Copper Cu				0.44	0.22	0.06	0.07	0.02				
Iron Fe				62.00	28.09	10.76	12.65	3.33				
Lead Pb				0.03	0.01	0.00	0.00	0.00				
Lithium Li				1.51	0.71	0.22	0.28	0.07				
Magnesium Mg				1939	995	343	379	100				
Manganese Mn				1.42	0.65	0.28	0.37	0.10				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.10	0.05	0.01	0.02	0.00				
Nickel Ni				0.21	0.10	0.03	0.03	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				1016	502	144	203	54				
Selenium Se				0.33	0.16	0.05	0.06	0.01				
Silicon SiO2				403	190	59	74	19				
Silver Ag				0.03	0.02	0.00	0.00	0.00				
Sodium Na				14230	7173	2196	2756	726				
Strontium Sr				10	6	2	2	1				
Tellurium Te				15.58	7.35	2.28	2.86	0.75				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.04	0.05	0.01	0.02	0.00				
Titanium Ti				4.72	2.23	0.69	0.87	0.23				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.57	0.27	0.07	0.08	0.02				
Zinc Zn				0.5	0.2	0.1	0.5	0.1				
Zirconium Zr				1.57	0.74	0.23	0.29	0.08				

Table H 7-A-3
Scenario 7

Loadings to Tail Lake (kg/month)												
Date	Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter												
TDS				34277	17652	4569	6867	1808				
TSS				1515	715	222	278	73				
Free CN												
Total CN				1	0	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				614	374	94	167	44				
Chloride				24772	13312	3861	5007	1318				
Total Ammonia				2	1	0	2	0				
Nitrate				2	1	0	0	0				
Nitrite				1	0	0	0	0				
Alkalinity				7790	4560	1234	1431	377				
OrthoPhosphate-P				1	0	0	0	0				
Phosphate-P				7	3	1	1	0				
Org. Carbon				1869.66	1029.68	274.17	286.11	75.33				
Hardness CaCO3				10283	6325	1691	2174	572				
Total Metals												
Aluminum Al				55.47	25.47	9.47	10.51	2.77				
Antimony Sb				0.05	0.04	0.03	0.04	0.01				
Arsenic As				0.15	0.08	0.02	0.03	0.01				
Barium Ba				0.52	0.28	0.12	0.13	0.03				
Beryllium Be				0.06	0.03	0.00	0.00	0.00				
Bismuth Bi				0.01	0.01	0.00	0.00	0.00				
Boron B				10.02	5.17	1.64	1.94	0.51				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				2092	1081	398	465	122				
Chromium Cr				0.21	0.16	0.05	0.02	0.01				
Cobalt Co				0.06	0.03	0.01	0.01	0.00				
Copper Cu				0.44	0.22	0.06	0.07	0.02				
Iron Fe				62.02	28.10	10.77	12.65	3.33				
Lead Pb				0.03	0.01	0.00	0.00	0.00				
Lithium Li				1.51	0.71	0.22	0.28	0.07				
Magnesium Mg				1939	995	343	380	100				
Manganese Mn				1.42	0.65	0.28	0.37	0.10				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.10	0.05	0.01	0.02	0.00				
Nickel Ni				0.21	0.10	0.03	0.03	0.01				
Phosphorus P				3	1	0	0	0				
Potassium K				1017	502	144	203	54				
Selenium Se				0.33	0.16	0.05	0.06	0.01				
Silicon SiO2				403	190	59	74	19				
Silver Ag				0.03	0.02	0.00	0.00	0.00				
Sodium Na				14234	7175	2197	2757	726				
Strontium Sr				10	6	2	2	1				
Tellurium Te				15.58	7.36	2.29	2.86	0.75				
Thallium Tl				0.01	0.00	0.00	0.00	0.00				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				0.04	0.05	0.01	0.02	0.00				
Titanium Ti				4.73	2.23	0.69	0.87	0.23				
Uranium U				0.03	0.01	0.00	0.00	0.00				
Vanadium V				0.57	0.27	0.07	0.08	0.02				
Zinc Zn				0.5	0.2	0.1	0.5	0.1				
Zirconium Zr				1.57	0.74	0.23	0.29	0.08				

Table H 7-A-3
Scenario 7

Loadings to Tail Lake (kg/month)												
Date	Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16	Year 10 Jan-17
Parameter												
TDS				63612	32759	8480	12743	3355				
TSS				2812	1328	412	516	136				
Free CN												
Total CN				1	1	0	0	0				
WAD CN												
CNO												
SCN												
Sulphate				1139	693	174	309	81				
Chloride				45973	24705	7166	9292	2446				
Total Ammonia				3	1	0	3	1				
Nitrate				3	2	1	1	0				
Nitrite				1	1	0	0	0				
Alkalinity				14457	8463	2290	2655	699				
OrthoPhosphate-P				1	1	0	0	0				
Phosphate-P				12	5	1	2	0				
Org. Carbon				3469.76	1910.91	508.81	530.98	139.80				
Hardness CaCO3				19084	11738	3138	4035	1062				
Total Metals												
Aluminum Al				102.95	47.26	17.57	19.50	5.13				
Antimony Sb				0.10	0.08	0.05	0.07	0.02				
Arsenic As				0.27	0.15	0.04	0.05	0.01				
Barium Ba				0.96	0.53	0.23	0.25	0.06				
Beryllium Be				0.12	0.05	0.00	0.00	0.00				
Bismuth Bi				0.02	0.01	0.00	0.00	0.00				
Boron B				18.59	9.59	3.05	3.59	0.95				
Cadmium Cd				0.00	0.00	0.00	0.00	0.00				
Calcium Ca				3882	2007	738	863	227				
Chromium Cr				0.40	0.29	0.10	0.05	0.01				
Cobalt Co				0.10	0.05	0.01	0.02	0.00				
Copper Cu				0.82	0.41	0.10	0.13	0.03				
Iron Fe				115.10	52.15	19.98	23.48	6.18				
Lead Pb				0.05	0.02	0.01	0.00	0.00				
Lithium Li				2.81	1.33	0.41	0.52	0.14				
Magnesium Mg				3599	1846	637	704	185				
Manganese Mn				2.63	1.21	0.51	0.69	0.18				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				0.18	0.09	0.02	0.03	0.01				
Nickel Ni				0.40	0.19	0.05	0.06	0.02				
Phosphorus P				5	1	0	0	0				
Potassium K				1887	932	266	377	99				
Selenium Se				0.61	0.29	0.08	0.10	0.03				
Silicon SiO2				748	353	110	137	36				
Silver Ag				0.06	0.03	0.00	0.00	0.00				
Sodium Na				26416	13316	4077	5116	1347				
Strontium Sr				19	10	3	4	1				
Tellurium Te				28.92	13.65	4.24	5.31	1.40				
Thallium Tl				0.02	0.01	0.00	0.00	0.00				
Thorium Th				0.03	0.01	0.00	0.00	0.00				
Tin Sn				0.07	0.09	0.03	0.03	0.01				
Titanium Ti				8.77	4.14	1.29	1.61	0.42				
Uranium U				0.05	0.02	0.00	0.00	0.00				
Vanadium V				1.06	0.50	0.13	0.14	0.04				
Zinc Zn				1.0	0.5	0.3	1.0	0.3				
Zirconium Zr				2.92	1.38	0.43	0.54	0.14				

Table H-7-A-1
Scenario 7

OUTPUT SUMMARY							Fraction of CCME in Doris Creek (%)
Discharge rate		m3/year					
Degradation None		Tail Lk Cu < CME Year		34			
		MMER	CCME	Tail Lake Year 2	Doris Creek Year 8	L'Roberts L Year 8	
Maximum Concentration							
pH			6 to 9	7 to 8	7 to 8	7 to 8	
TDS	mg/L			646	172	178	
TSS	mg/L			5.0	7.0	8.1	
Free CN	mg/L		0.005	0.0052	0.00017	0.00009	3%
Total CN	mg/L	1.0		0.051	0.004	0.003	
WAD CN	mg/L			0.0069	0.0002	0.0001	
CNO	mg/L			5.7	0.19	0.10	
SCN	mg/L			0.078	0.003	0.001	
Sulphate	mg/L			72	5.5	5.8	
Chloride	mg/L			419	82	77	
Total Ammonia	mg/L		0.97	0.86	0.047	0.025	5%
Nitrate	mg/L		2.9	4.7	0.20	0.11	7%
Nitrite	mg/L		0.018	0.64	0.027	0.015	149%
Alkalinity	mg/L			48	28	26	
OrthoPhosphate-P	mg/L			0.1328	0.0059	0.0037	
Phosphate-P	mg/L			0.1361	0.0273	0.0263	
Org. Carbon	mg/L			6.6	7.5	7.1	
Hardness CaCO3	mg/L			90	47	46	
Total Metals							
Aluminum Al	mg/L		0.1	0.16	0.08	0.25	84%
Antimony Sb	mg/L			0.0122	0.0031	0.0019	
Arsenic As	mg/L	0.5	0.005	0.00	0.0005	0.0005	10%
Barium Ba	mg/L			0.0085	0.0033	0.0052	
Beryllium Be	mg/L			0.00051	0.00003	0.00002	
Bismuth Bi	mg/L			0.01167	0.00048	0.00033	
Boron B	mg/L			0.036	0.035	0.030	
Cadmium Cd	mg/L		0.000038	0.000044	0.0000039	0.0000153	10%
Calcium Ca	mg/L			194	14	11	
Chromium Cr	mg/L		0.001	0.0052	0.001	0.001	77%
Cobalt Co	mg/L			0.0081	0.0011	0.0005	
Copper Cu	mg/L	0.3	0.002	0.007	0.0017	0.0020	85%
Iron Fe	mg/L		0.3	0.18	0.13	0.28	42%
Lead Pb	mg/L	0.2	0.002	0.00033	0.00007	0.00026	3%
Lithium Li	mg/L			0.0056	0.0030	0.0029	
Magnesium Mg	mg/L			8.1	7.3	7.3	
Manganese Mn	mg/L			0.022	0.021	0.024	
Mercury Hg	mg/L		0.0001	0.0000124	0.0000012	0.0000009	1%
Molybdenum Mo	mg/L		0.073	0.0070	0.00039	0.00033	1%
Nickel Ni	mg/L	0.5	0.025	0.007	0.0007	0.0007	3%
Phosphorus P	mg/L			0.201	0.029	0.027	
Potassium K	mg/L			32	3.6	3.2	
Selenium Se	mg/L		0.001	0.00101	0.00090	0.00084	90%
Silicon SiO2	mg/L			3.2	0.61	0.57	
Silver Ag	mg/L		0.0001	0.00011	0.0000069	0.0000057	7%
Sodium Na	mg/L			116	43	40	
Strontium Sr	mg/L			0.073	0.043	0.047	
Tellurium Te	mg/L			0.054	0.050	0.052	
Thallium Tl	mg/L		0.0008	0.000040	0.000031	0.002001	4%
Thorium Th	mg/L			0.000047	0.0000025	0.0000013	
Tin Sn	mg/L			0.00186	0.00045	0.00004	
Titanium Ti	mg/L			0.0141	0.0064	0.0064	
Uranium U	mg/L			0.000079	0.000040	0.000044	
Vanadium V	mg/L			0.0028	0.0006	0.0005	
Zinc Zn	mg/L	0.5	0.03	0.018	0.0035	0.0055	12%
Zirconium Zr	mg/L			0.0056	0.0050	0.0052	

Table H-7-A-2
Scenario 7

Water Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter													
TDS	mg/L				140	121	125	145	145				
TSS	mg/L				4.0	5.9	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				2.8	2.7	2.9	3.0	3.0				
Chloride	mg/L				61	61	59	63	63				
Total Ammonia	mg/L				0.007	0.010	0.016	0.015	0.015				
Nitrate	mg/L				0.02	0.02	0.02	0.02	0.02				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				28	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00000	0.00000	0.00000	0.00000				
Bismuth Bi	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000029	0.0000029	0.0000024	0.0000024	0.0000024				
Calcium Ca	mg/L				8	8	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.024	0.020	0.020				
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000014	0.0000016	0.0000012	0.0000013	0.0000013				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000031	0.000039	0.000032	0.000032				
Vanadium V	mg/L				0.0006	0.0000	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0032	0.0028	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-7-A-2
Scenario 7

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter													
TDS	mg/L				140	121	125	145	145				
TSS	mg/L				4.0	5.9	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				2.8	2.7	2.9	3.0	3.0				
Chloride	mg/L				61	61	59	63	63				
Total Ammonia	mg/L				0.008	0.011	0.017	0.016	0.016				
Nitrate	mg/L				0.03	0.03	0.03	0.03	0.03				
Nitrite	mg/L				0.003	0.003	0.003	0.003	0.003				
Alkalinity	mg/L				28	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca	mg/L				9	8	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.024	0.020	0.020				
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.51	0.51	0.51	0.51	0.51				
Silver Ag	mg/L				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-7-A-2
Scenario 7

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter													
TDS	mg/L				140	121	125	145	145				
TSS	mg/L				4.0	5.9	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				2.8	2.7	2.9	3.0	3.0				
Chloride	mg/L				61	61	59	63	63				
Total Ammonia	mg/L				0.008	0.011	0.017	0.016	0.016				
Nitrate	mg/L				0.03	0.03	0.03	0.03	0.03				
Nitrite	mg/L				0.003	0.003	0.003	0.003	0.003				
Alkalinity	mg/L				28	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca	mg/L				9	8	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.024	0.020	0.020				
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.51	0.51	0.51	0.51	0.51				
Silver Ag	mg/L				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-7-A-2
Scenario 7

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter													
TDS	mg/L				140	121	125	145	145				
TSS	mg/L				4.0	5.9	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				2.8	2.7	2.9	3.0	3.0				
Chloride	mg/L				61	61	59	63	63				
Total Ammonia	mg/L				0.008	0.011	0.017	0.016	0.016				
Nitrate	mg/L				0.03	0.03	0.03	0.03	0.03				
Nitrite	mg/L				0.003	0.003	0.003	0.003	0.003				
Alkalinity	mg/L				28	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca	mg/L				9	8	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.024	0.020	0.020				
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.51	0.51	0.51	0.51	0.51				
Silver Ag	mg/L				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-7-A-2
Scenario 7

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter													
TDS	mg/L				140	121	125	145	145				
TSS	mg/L				4.0	5.9	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				2.8	2.7	2.9	3.0	3.0				
Chloride	mg/L				61	61	59	63	63				
Total Ammonia	mg/L				0.008	0.011	0.017	0.016	0.016				
Nitrate	mg/L				0.03	0.03	0.03	0.03	0.03				
Nitrite	mg/L				0.003	0.003	0.003	0.003	0.003				
Alkalinity	mg/L				28	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca	mg/L				9	8	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo	mg/L				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.024	0.020	0.020				
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.51	0.51	0.51	0.51	0.51				
Silver Ag	mg/L				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000002	0.000002	0.000002	0.000002	0.000002				
Tin Sn	mg/L				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V	mg/L				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-7-A-2
Scenario 7

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter													
TDS	mg/L				140	121	125	145	145				
TSS	mg/L				4.0	5.9	6.0	7.0	7.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				2.8	2.7	2.8	3.0	3.0				
Chloride	mg/L				61	61	59	63	63				
Total Ammonia	mg/L				0.005	0.008	0.014	0.013	0.013				
Nitrate	mg/L				0.01	0.01	0.01	0.01	0.01				
Nitrite	mg/L				0.002	0.002	0.002	0.002	0.002				
Alkalinity	mg/L				28	25	27	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3	mg/L				46	43	43	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00000	0.00000	0.00000	0.00000				
Bismuth Bi	mg/L				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000025	0.0000025	0.0000020	0.0000020	0.0000020				
Calcium Ca	mg/L				8	8	8	7	7				
Chromium Cr	mg/L				0.001	0.000	0.000	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.018	0.024	0.020	0.020				
Potassium K	mg/L				2.8	2.4	2.4	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000008	0.0000010	0.0000006	0.0000007	0.0000007				
Sodium Na	mg/L				39	33	34	32	32				
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L												
Tin Sn	mg/L				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000025	0.000030	0.000038	0.000031	0.000031				
Vanadium V	mg/L				0.0006	0.0000	0.0002	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0032	0.0028	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-7-A-2
Scenario 7

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter													
TDS	mg/L				140	135	141	145	145				
TSS	mg/L				4.0	5.8	5.9	7.0	7.0				
Free CN	mg/L					0.00013	0.00014						
Total CN	mg/L				0.002	0.003	0.003	0.002	0.002				
WAD CN	mg/L					0.0002	0.0002						
CNO	mg/L					0.14	0.15						
SCN	mg/L					0.002	0.002						
Sulphate	mg/L				2.8	4.6	4.8	3.0	3.0				
Chloride	mg/L				61	70	70	63	63				
Total Ammonia	mg/L				0.005	0.034	0.042	0.013	0.013				
Nitrate	mg/L				0.01	0.15	0.16	0.01	0.01				
Nitrite	mg/L				0.002	0.021	0.022	0.002	0.002				
Alkalinity	mg/L				28	26	28	27	27				
OrthoPhosphate-P	mg/L				0.0008	0.0046	0.0049	0.0008	0.0008				
Phosphate-P	mg/L				0.0165	0.0213	0.0273	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3	mg/L				46	44	44	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0004	0.0012	0.0031	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0029	0.0033	0.0031	0.0031	0.0031				
Beryllium Be	mg/L				0.00001	0.00002	0.00002	0.00000	0.00000				
Bismuth Bi	mg/L				0.00003	0.00037	0.00039	0.00003	0.00003				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000025	0.0000038	0.0000034	0.0000020	0.0000020				
Calcium Ca	mg/L				8	13	13	7	7				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0000	0.0003	0.0011	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0017	0.0014	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.12	0.08	0.09	0.09				
Lead Pb	mg/L				0.00002	0.00007	0.00005	0.00004	0.00004				
Lithium Li	mg/L				0.0028	0.0029	0.0029	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000006	0.0000007	0.0000008	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00016	0.00033	0.00037	0.00016	0.00016				
Nickel Ni	mg/L				0.0004	0.0007	0.0006	0.0004	0.0004				
Phosphorus P	mg/L				0.017	0.023	0.029	0.020	0.020				
Potassium K	mg/L				2.8	3.2	3.2	2.3	2.3				
Selenium Se	mg/L				0.00090	0.00057	0.00061	0.00056	0.00056				
Silicon SiO2	mg/L				0.50	0.58	0.58	0.50	0.50				
Silver Ag	mg/L				0.0000008	0.0000051	0.0000051	0.0000007	0.0000007				
Sodium Na	mg/L				39	34	36	32	32				
Strontium Sr	mg/L				0.041	0.043	0.037	0.040	0.040				
Tellurium Te	mg/L				0.050	0.049	0.049	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L					0.000001	0.000001						
Tin Sn	mg/L				0.00040	0.00044	0.00044	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000025	0.000031	0.000039	0.000031	0.000031				
Vanadium V	mg/L				0.0006	0.0001	0.0003	0.0001	0.0001				
Zinc Zn	mg/L				0.0009	0.0035	0.0033	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-7-A-2
Scenario 7

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter													
TDS	mg/L				162	121	147	145	172				
TSS	mg/L				3.9	5.9	5.9	7.0	6.8				
Free CN	mg/L				0.00014		0.00013		0.00017				
Total CN	mg/L				0.003	0.002	0.003	0.002	0.004				
WAD CN	mg/L				0.0002		0.0002		0.0002				
CNO	mg/L				0.16		0.15		0.19				
SCN	mg/L				0.002		0.002		0.003				
Sulphate	mg/L				4.8	2.7	4.8	3.0	5.5				
Chloride	mg/L				76	61	74	63	82				
Total Ammonia	mg/L				0.034	0.008	0.041	0.013	0.047				
Nitrate	mg/L				0.17	0.01	0.16	0.01	0.20				
Nitrite	mg/L				0.023	0.002	0.022	0.002	0.027				
Alkalinity	mg/L				28	25	28	27	27				
OrthoPhosphate-P	mg/L				0.0049	0.0008	0.0047	0.0008	0.0059				
Phosphate-P	mg/L				0.0202	0.0179	0.0272	0.0195	0.0239				
Org. Carbon	mg/L				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3	mg/L				47	43	44	44	45				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0007	0.0008	0.0031	0.0005	0.0009				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0030	0.0032	0.0031	0.0031	0.0033				
Beryllium Be	mg/L				0.00002	0.00000	0.00002	0.00000	0.00003				
Bismuth Bi	mg/L				0.00040	0.00003	0.00038	0.00003	0.00048				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000039	0.0000025	0.0000034	0.0000020	0.0000038				
Calcium Ca	mg/L				14	8	13	7	14				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0003	0.0001	0.0011	0.0001	0.0004				
Copper Cu	mg/L				0.0014	0.0015	0.0014	0.0015	0.0017				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00003	0.00006	0.00005	0.00004	0.00005				
Lithium Li	mg/L				0.0029	0.0028	0.0029	0.0028	0.0029				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000008	0.0000006	0.0000008	0.0000006	0.0000009				
Molybdenum Mo	mg/L				0.00035	0.00015	0.00036	0.00016	0.00039				
Nickel Ni	mg/L				0.0006	0.0006	0.0006	0.0004	0.0007				
Phosphorus P	mg/L				0.022	0.018	0.029	0.020	0.026				
Potassium K	mg/L				3.6	2.4	3.2	2.3	3.4				
Selenium Se	mg/L				0.00088	0.00057	0.00061	0.00056	0.00055				
Silicon SiO2	mg/L				0.59	0.50	0.58	0.50	0.61				
Silver Ag	mg/L				0.0000054	0.0000010	0.0000052	0.0000007	0.0000066				
Sodium Na	mg/L				43	33	38	32	37				
Strontium Sr	mg/L				0.041	0.042	0.037	0.040	0.041				
Tellurium Te	mg/L				0.049	0.050	0.049	0.050	0.049				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000001		0.000001		0.000002				
Tin Sn	mg/L				0.00044	0.00040	0.00044	0.00040	0.00045				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000030	0.000039	0.000031	0.000033				
Vanadium V	mg/L				0.0006	0.0000	0.0003	0.0001	0.0003				
Zinc Zn	mg/L				0.0014	0.0032	0.0032	0.0017	0.0023				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-7-A-2
Scenario 7

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter													
TDS	mg/L				161	121	146	145	145				
TSS	mg/L				4.0	5.9	5.9	7.0	7.0				
Free CN	mg/L				0.00013		0.00013						
Total CN	mg/L				0.003	0.002	0.003	0.002	0.002				
WAD CN	mg/L				0.0002		0.0002						
CNO	mg/L				0.15		0.14						
SCN	mg/L				0.002		0.002						
Sulphate	mg/L				4.7	2.7	4.7	3.0	3.0				
Chloride	mg/L				75	61	73	63	63				
Total Ammonia	mg/L				0.032	0.008	0.039	0.013	0.013				
Nitrate	mg/L				0.16	0.01	0.15	0.01	0.01				
Nitrite	mg/L				0.021	0.002	0.020	0.002	0.002				
Alkalinity	mg/L				28	25	28	27	27				
OrthoPhosphate-P	mg/L				0.0047	0.0008	0.0045	0.0008	0.0008				
Phosphate-P	mg/L				0.0200	0.0179	0.0270	0.0195	0.0195				
Org. Carbon	mg/L				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3	mg/L				47	43	44	44	44				
Total Metals													
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07				
Antimony Sb	mg/L				0.0007	0.0008	0.0031	0.0005	0.0005				
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba	mg/L				0.0030	0.0032	0.0031	0.0031	0.0031				
Beryllium Be	mg/L				0.00002	0.00000	0.00002	0.00000	0.00000				
Bismuth Bi	mg/L				0.00038	0.00003	0.00036	0.00003	0.00003				
Boron B	mg/L				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd	mg/L				0.0000039	0.0000025	0.0000033	0.0000020	0.0000020				
Calcium Ca	mg/L				14	8	13	7	7				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0003	0.0001	0.0011	0.0001	0.0001				
Copper Cu	mg/L				0.0014	0.0015	0.0014	0.0015	0.0015				
Iron Fe	mg/L				0.05	0.13	0.08	0.09	0.09				
Lead Pb	mg/L				0.00003	0.00006	0.00005	0.00004	0.00004				
Lithium Li	mg/L				0.0029	0.0028	0.0029	0.0028	0.0028				
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5				
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010				
Mercury Hg	mg/L				0.0000008	0.0000006	0.0000008	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00034	0.00015	0.00035	0.00016	0.00016				
Nickel Ni	mg/L				0.0006	0.0006	0.0006	0.0004	0.0004				
Phosphorus P	mg/L				0.022	0.018	0.029	0.020	0.020				
Potassium K	mg/L				3.6	2.4	3.1	2.3	2.3				
Selenium Se	mg/L				0.00088	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2	mg/L				0.58	0.50	0.58	0.50	0.50				
Silver Ag	mg/L				0.0000054	0.0000010	0.0000052	0.0000007	0.0000007				
Sodium Na	mg/L				43	33	38	32	32				
Strontium Sr	mg/L				0.041	0.042	0.037	0.040	0.040				
Tellurium Te	mg/L				0.049	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th	mg/L				0.000001		0.000001						
Tin Sn	mg/L				0.00044	0.00040	0.00044	0.00040	0.00040				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000026	0.000030	0.000039	0.000031	0.000031				
Vanadium V	mg/L				0.0006	0.0000	0.0003	0.0001	0.0001				
Zinc Zn	mg/L				0.0014	0.0032	0.0032	0.0017	0.0017				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-7-A-2
Scenario 7

Water Quality in DORIS CREEK (d/s of tWater Quality in DORIS CREEK (d/s of the waterfall)

Date		Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16
Parameter												
TDS	mg/L				151	121	136	145	158			
TSS	mg/L				4.0	5.9	5.9	7.0	6.9			
Free CN	mg/L				0.00007		0.00007		0.00008			
Total CN	mg/L				0.003	0.002	0.003	0.002	0.003			
WAD CN	mg/L				0.0001		0.0001		0.0001			
CNO	mg/L				0.08		0.07		0.09			
SCN	mg/L				0.001		0.001		0.001			
Sulphate	mg/L				3.8	2.7	3.8	3.0	4.2			
Chloride	mg/L				68	61	66	63	72			
Total Ammonia	mg/L				0.019	0.008	0.027	0.013	0.030			
Nitrate	mg/L				0.08	0.01	0.08	0.01	0.10			
Nitrite	mg/L				0.012	0.002	0.012	0.002	0.014			
Alkalinity	mg/L				28	25	27	27	27			
OrthoPhosphate-P	mg/L				0.0028	0.0008	0.0027	0.0008	0.0033			
Phosphate-P	mg/L				0.0183	0.0179	0.0256	0.0195	0.0217			
Org. Carbon	mg/L				5.5	5.1	7.4	5.0	5.0			
Hardness CaCO3	mg/L				46	43	43	44	45			
Total Metals												
Aluminum Al	mg/L				0.03	0.06	0.08	0.07	0.07			
Antimony Sb	mg/L				0.0005	0.0008	0.0030	0.0005	0.0007			
Arsenic As	mg/L				0.0005	0.0004	0.0004	0.0004	0.0004			
Barium Ba	mg/L				0.0029	0.0032	0.0031	0.0031	0.0032			
Beryllium Be	mg/L				0.00002	0.00000	0.00001	0.00000	0.00002			
Bismuth Bi	mg/L				0.00021	0.00003	0.00020	0.00003	0.00025			
Boron B	mg/L				0.034	0.023	0.023	0.022	0.023			
Cadmium Cd	mg/L				0.0000032	0.0000025	0.0000027	0.0000020	0.0000029			
Calcium Ca	mg/L				11	8	10	7	11			
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000			
Cobalt Co	mg/L				0.0002	0.0001	0.0010	0.0001	0.0002			
Copper Cu	mg/L				0.0013	0.0015	0.0013	0.0015	0.0016			
Iron Fe	mg/L				0.05	0.13	0.09	0.09	0.09			
Lead Pb	mg/L				0.00002	0.00006	0.00004	0.00004	0.00004			
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0029			
Magnesium Mg	mg/L				7.3	6.6	6.6	6.5	6.5			
Manganese Mn	mg/L				0.007	0.021	0.013	0.010	0.010			
Mercury Hg	mg/L				0.0000007	0.0000006	0.0000008	0.0000006	0.0000008			
Molybdenum Mo	mg/L				0.00025	0.00015	0.00027	0.00016	0.00028			
Nickel Ni	mg/L				0.0005	0.0006	0.0005	0.0004	0.0005			
Phosphorus P	mg/L				0.019	0.018	0.026	0.020	0.023			
Potassium K	mg/L				3.2	2.4	2.8	2.3	2.8			
Selenium Se	mg/L				0.00089	0.00057	0.00062	0.00056	0.00056			
Silicon SiO2	mg/L				0.55	0.50	0.55	0.50	0.56			
Silver Ag	mg/L				0.0000033	0.0000010	0.0000033	0.0000007	0.0000041			
Sodium Na	mg/L				41	33	36	32	35			
Strontium Sr	mg/L				0.041	0.042	0.036	0.040	0.040			
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050			
Thallium Tl	mg/L				0.000030	0.000030	0.000030	0.000030	0.000030			
Thorium Th	mg/L				0.000001		0.000001		0.000001			
Tin Sn	mg/L				0.00042	0.00040	0.00042	0.00040	0.00043			
Titanium Ti	mg/L				0.0060	0.0060	0.0061	0.0060	0.0061			
Uranium U	mg/L				0.000026	0.000030	0.000039	0.000031	0.000032			
Vanadium V	mg/L				0.0006	0.0000	0.0003	0.0001	0.0002			
Zinc Zn	mg/L				0.0012	0.0032	0.0030	0.0017	0.0020			
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050			

Table H 7-A-3
Scenario 7**Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter												
TDS				1870379	1004665	436406	647976	226117				
TSS				53439	48680	20948	31282	10916				
Free CN												
Total CN				27	17	7	9	3				
WAD CN												
CNO												
SCN												
Sulphate				37651	22585	9979	13399	4676				
Chloride				808271	501297	204238	279300	97464				
Total Ammonia				91	81	55	66	23				
Nitrate				268	166	70	90	31				
Nitrite				31	19	8	10	4				
Alkalinity				367396	210255	94264	118423	41325				
OrthoPhosphate-P				10	6	3	3	1				
Phosphate-P				220	148	84	87	30				
Org. Carbon				73479	42465	26184	22344	7797				
Hardness CaCO3				607873	354222	148378	196627	68615				
Total Metals												
Aluminum Al				449	498	283	324	113				
Antimony Sb				4.8	6.9	9.9	2.1	0.7				
Arsenic As				6.4	3.4	1.3	1.7	0.6				
Barium Ba				38	26	10	14	5				
Beryllium Be				0.10	0.04	0.02	0.02	0.01				
Bismuth Bi				0.42	0.26	0.11	0.14	0.05				
Boron B				461	187	81	100	35				
Cadmium Cd				0.04	0.02	0.01	0.01	0.00				
Calcium Ca				113461	64901	26613	32783	11440				
Chromium Cr				9	2	2	1	0				
Cobalt Co				0.64	1.13	3.10	0.34	0.12				
Copper Cu				16	13	4	7	2				
Iron Fe				683	1036	296	404	141				
Lead Pb				0.26	0.52	0.13	0.17	0.06				
Lithium Li				37	23	10	13	4				
Magnesium Mg				97557	54374	23120	28953	10103				
Manganese Mn				88	172	46	45	16				
Mercury Hg				0.01	0.01	0.00	0.00	0.00				
Molybdenum Mo				2.10	1.27	0.64	0.72	0.25				
Nickel Ni				5.42	4.72	1.62	1.94	0.68				
Phosphorus P				224	150	85	88	31				
Potassium K				37682	20057	8398	10460	3650				
Selenium Se				12.02	4.75	2.16	2.49	0.87				
Silicon SiO2				6737	4178	1761	2253	786				
Silver Ag				0.02	0.01	0.00	0.01	0.00				
Sodium Na				525050	274268	120101	143600	50110				
Strontium Sr				543	348	125	179	62				
Tellurium Te				668	414	175	223	78				
Thallium Tl				0.40	0.25	0.11	0.13	0.05				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				5.37	3.33	1.40	1.80	0.63				
Titanium Ti				80	50	21	27	9				
Uranium U				0.34	0.25	0.14	0.14	0.05				
Vanadium V				7.40	0.40	0.83	0.63	0.22				
Zinc Zn				12.14	26.26	9.95	7.61	2.66				
Zirconium Zr				67	42	18	22	8				

Table H 7-A-3
Scenario 7**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter												
TDS				1007213	541020	235008	348940	121765				
TSS				28778	26214	11280	16845	5878				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN												
Sulphate				20357	12213	5395	7242	2527				
Chloride				435260	269952	109984	150405	52485				
Total Ammonia				60	50	33	39	14				
Nitrate				231	143	60	77	27				
Nitrite				19	12	5	6	2				
Alkalinity				197845	113224	50762	63772	22254				
OrthoPhosphate-P				5	3	1	2	1				
Phosphate-P				119	80	45	47	16				
Org. Carbon				39569	22868	14100	12032	4199				
Hardness CaCO3				327344	190751	79903	105885	36950				
Total Metals												
Aluminum Al				244	270	153	175	61				
Antimony Sb				2.6	3.7	5.4	1.1	0.4				
Arsenic As				3.5	1.8	0.7	0.9	0.3				
Barium Ba				21	14	6	7	3				
Beryllium Be				0.06	0.03	0.01	0.02	0.01				
Bismuth Bi				0.24	0.15	0.06	0.08	0.03				
Boron B				249	101	44	54	19				
Cadmium Cd				0.02	0.01	0.01	0.01	0.00				
Calcium Ca				61239	35036	14368	17701	6177				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.36	0.62	1.67	0.19	0.07				
Copper Cu				9	7	2	4	1				
Iron Fe				368	558	160	218	76				
Lead Pb				0.15	0.29	0.08	0.09	0.03				
Lithium Li				20	13	5	7	2				
Magnesium Mg				52549	29290	12454	15596	5442				
Manganese Mn				48	93	25	24	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.13	0.68	0.34	0.39	0.13				
Nickel Ni				2.93	2.55	0.87	1.05	0.37				
Phosphorus P				122	82	46	48	17				
Potassium K				20296	10803	4524	5634	1966				
Selenium Se				6.48	2.56	1.17	1.35	0.47				
Silicon SiO2				3654	2266	955	1222	427				
Silver Ag				0.01	0.01	0.00	0.00	0.00				
Sodium Na				282747	147697	64676	77331	26985				
Strontium Sr				292	188	67	96	34				
Tellurium Te				360	223	94	120	42				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				2.90	1.80	0.76	0.97	0.34				
Titanium Ti				43	27	11	14	5				
Uranium U				0.19	0.14	0.07	0.08	0.03				
Vanadium V				4.01	0.23	0.45	0.35	0.12				
Zinc Zn				6.60	14.17	5.37	4.12	1.44				
Zirconium Zr				36	22	9	12	4				

Table H 7-A-3
Scenario 7**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter												
TDS				1007213	541020	235008	348940	121765				
TSS				28778	26214	11280	16845	5878				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN												
Sulphate				20357	12213	5395	7242	2527				
Chloride				435260	269952	109984	150405	52485				
Total Ammonia				60	50	33	39	14				
Nitrate				231	143	60	77	27				
Nitrite				19	12	5	6	2				
Alkalinity				197845	113224	50762	63772	22254				
OrthoPhosphate-P				5	3	1	2	1				
Phosphate-P				119	80	45	47	16				
Org. Carbon				39569	22868	14100	12032	4199				
Hardness CaCO3				327344	190751	79903	105885	36950				
Total Metals												
Aluminum Al				244	270	153	175	61				
Antimony Sb				2.6	3.7	5.4	1.1	0.4				
Arsenic As				3.5	1.8	0.7	0.9	0.3				
Barium Ba				21	14	6	7	3				
Beryllium Be				0.06	0.03	0.01	0.02	0.01				
Bismuth Bi				0.24	0.15	0.06	0.08	0.03				
Boron B				249	101	44	54	19				
Cadmium Cd				0.02	0.01	0.01	0.01	0.00				
Calcium Ca				61239	35036	14368	17701	6177				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.36	0.62	1.67	0.19	0.07				
Copper Cu				9	7	2	4	1				
Iron Fe				368	558	160	218	76				
Lead Pb				0.15	0.29	0.08	0.09	0.03				
Lithium Li				20	13	5	7	2				
Magnesium Mg				52549	29290	12454	15596	5442				
Manganese Mn				48	93	25	24	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.13	0.68	0.34	0.39	0.13				
Nickel Ni				2.93	2.55	0.87	1.05	0.37				
Phosphorus P				122	82	46	48	17				
Potassium K				20296	10803	4524	5634	1966				
Selenium Se				6.48	2.56	1.17	1.35	0.47				
Silicon SiO2				3654	2266	955	1222	427				
Silver Ag				0.01	0.01	0.00	0.00	0.00				
Sodium Na				282747	147697	64676	77331	26985				
Strontium Sr				292	188	67	96	34				
Tellurium Te				360	223	94	120	42				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				2.90	1.80	0.76	0.97	0.34				
Titanium Ti				43	27	11	14	5				
Uranium U				0.19	0.14	0.07	0.08	0.03				
Vanadium V				4.01	0.23	0.45	0.35	0.12				
Zinc Zn				6.60	14.17	5.37	4.12	1.44				
Zirconium Zr				36	22	9	12	4				

Table H 7-A-3
Scenario 7**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter												
TDS				1007213	541020	235008	348940	121765				
TSS				28778	26214	11280	16845	5878				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN												
Sulphate				20357	12213	5395	7242	2527				
Chloride				435260	269952	109984	150405	52485				
Total Ammonia				60	50	33	39	14				
Nitrate				231	143	60	77	27				
Nitrite				19	12	5	6	2				
Alkalinity				197845	113224	50762	63772	22254				
OrthoPhosphate-P				5	3	1	2	1				
Phosphate-P				119	80	45	47	16				
Org. Carbon				39569	22868	14100	12032	4199				
Hardness CaCO3				327344	190751	79903	105885	36950				
Total Metals												
Aluminum Al				244	270	153	175	61				
Antimony Sb				2.6	3.7	5.4	1.1	0.4				
Arsenic As				3.5	1.8	0.7	0.9	0.3				
Barium Ba				21	14	6	7	3				
Beryllium Be				0.06	0.03	0.01	0.02	0.01				
Bismuth Bi				0.24	0.15	0.06	0.08	0.03				
Boron B				249	101	44	54	19				
Cadmium Cd				0.02	0.01	0.01	0.01	0.00				
Calcium Ca				61239	35036	14368	17701	6177				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.36	0.62	1.67	0.19	0.07				
Copper Cu				9	7	2	4	1				
Iron Fe				368	558	160	218	76				
Lead Pb				0.15	0.29	0.08	0.09	0.03				
Lithium Li				20	13	5	7	2				
Magnesium Mg				52549	29290	12454	15596	5442				
Manganese Mn				48	93	25	24	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.13	0.68	0.34	0.39	0.13				
Nickel Ni				2.93	2.55	0.87	1.05	0.37				
Phosphorus P				122	82	46	48	17				
Potassium K				20296	10803	4524	5634	1966				
Selenium Se				6.48	2.56	1.17	1.35	0.47				
Silicon SiO2				3654	2266	955	1222	427				
Silver Ag				0.01	0.01	0.00	0.00	0.00				
Sodium Na				282747	147697	64676	77331	26985				
Strontium Sr				292	188	67	96	34				
Tellurium Te				360	223	94	120	42				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				2.90	1.80	0.76	0.97	0.34				
Titanium Ti				43	27	11	14	5				
Uranium U				0.19	0.14	0.07	0.08	0.03				
Vanadium V				4.01	0.23	0.45	0.35	0.12				
Zinc Zn				6.60	14.17	5.37	4.12	1.44				
Zirconium Zr				36	22	9	12	4				

Table H 7-A-3
Scenario 7**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter												
TDS				1007213	541020	235008	348940	121765				
TSS				28778	26214	11280	16845	5878				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN												
Sulphate				20357	12213	5395	7242	2527				
Chloride				435260	269952	109984	150405	52485				
Total Ammonia				60	50	33	39	14				
Nitrate				231	143	60	77	27				
Nitrite				19	12	5	6	2				
Alkalinity				197845	113224	50762	63772	22254				
OrthoPhosphate-P				5	3	1	2	1				
Phosphate-P				119	80	45	47	16				
Org. Carbon				39569	22868	14100	12032	4199				
Hardness CaCO3				327344	190751	79903	105885	36950				
Total Metals												
Aluminum Al				244	270	153	175	61				
Antimony Sb				2.6	3.7	5.4	1.1	0.4				
Arsenic As				3.5	1.8	0.7	0.9	0.3				
Barium Ba				21	14	6	7	3				
Beryllium Be				0.06	0.03	0.01	0.02	0.01				
Bismuth Bi				0.24	0.15	0.06	0.08	0.03				
Boron B				249	101	44	54	19				
Cadmium Cd				0.02	0.01	0.01	0.01	0.00				
Calcium Ca				61239	35036	14368	17701	6177				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.36	0.62	1.67	0.19	0.07				
Copper Cu				9	7	2	4	1				
Iron Fe				368	558	160	218	76				
Lead Pb				0.15	0.29	0.08	0.09	0.03				
Lithium Li				20	13	5	7	2				
Magnesium Mg				52549	29290	12454	15596	5442				
Manganese Mn				48	93	25	24	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.13	0.68	0.34	0.39	0.13				
Nickel Ni				2.93	2.55	0.87	1.05	0.37				
Phosphorus P				122	82	46	48	17				
Potassium K				20296	10803	4524	5634	1966				
Selenium Se				6.48	2.56	1.17	1.35	0.47				
Silicon SiO2				3654	2266	955	1222	427				
Silver Ag				0.01	0.01	0.00	0.00	0.00				
Sodium Na				282747	147697	64676	77331	26985				
Strontium Sr				292	188	67	96	34				
Tellurium Te				360	223	94	120	42				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th				0.01	0.01	0.00	0.00	0.00				
Tin Sn				2.90	1.80	0.76	0.97	0.34				
Titanium Ti				43	27	11	14	5				
Uranium U				0.19	0.14	0.07	0.08	0.03				
Vanadium V				4.01	0.23	0.45	0.35	0.12				
Zinc Zn				6.60	14.17	5.37	4.12	1.44				
Zirconium Zr				36	22	9	12	4				

Table H 7-A-3
Scenario 7**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter												
TDS				1007213	541020	235008	348940	121765				
TSS				28778	26214	11280	16845	5878				
Free CN												
Total CN				14	9	4	5	2				
WAD CN												
CNO												
SCN												
Sulphate				20180	12103	5349	7183	2507				
Chloride				435260	269952	109984	150405	52485				
Total Ammonia				36	36	26	31	11				
Nitrate				43	27	11	14	5				
Nitrite				14	9	4	5	2				
Alkalinity				197845	113224	50762	63772	22254				
OrthoPhosphate-P				5	3	1	2	1				
Phosphate-P				119	80	45	47	16				
Org. Carbon				39569	22868	14100	12032	4199				
Hardness CaCO3				327344	190751	79903	105885	36950				
Total Metals												
Aluminum Al				239	266	152	174	61				
Antimony Sb				2.6	3.7	5.3	1.1	0.4				
Arsenic As				3.4	1.8	0.7	0.9	0.3				
Barium Ba				21	14	6	7	3				
Beryllium Be				0.04	0.01	0.01	0.01	0.00				
Bismuth Bi				0.22	0.13	0.06	0.07	0.03				
Boron B				247	100	44	54	19				
Cadmium Cd				0.02	0.01	0.00	0.00	0.00				
Calcium Ca				60936	34848	14288	17599	6141				
Chromium Cr				5	1	1	1	0				
Cobalt Co				0.33	0.60	1.67	0.18	0.06				
Copper Cu				9	7	2	4	1				
Iron Fe				367	558	159	217	76				
Lead Pb				0.13	0.27	0.07	0.09	0.03				
Lithium Li				20	12	5	7	2				
Magnesium Mg				52519	29271	12446	15586	5439				
Manganese Mn				47	93	25	24	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.13	0.68	0.34	0.39	0.13				
Nickel Ni				2.91	2.53	0.87	1.04	0.36				
Phosphorus P				119	80	45	47	16				
Potassium K				20288	10798	4522	5631	1965				
Selenium Se				6.46	2.55	1.16	1.34	0.47				
Silicon SiO2				3597	2231	940	1203	420				
Silver Ag				0.01	0.00	0.00	0.00	0.00				
Sodium Na				282739	147693	64674	77328	26984				
Strontium Sr				292	187	67	96	34				
Tellurium Te				360	223	94	120	42				
Thallium Tl				0.22	0.13	0.06	0.07	0.03				
Thorium Th												
Tin Sn				2.88	1.78	0.75	0.96	0.34				
Titanium Ti				43	27	11	14	5				
Uranium U				0.18	0.13	0.07	0.08	0.03				
Vanadium V				3.96	0.20	0.44	0.33	0.12				
Zinc Zn				6.47	14.10	5.34	4.08	1.42				
Zirconium Zr				36	22	9	12	4				

Table H 7-A-3
Scenario 7**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter												
TDS				1007213	624301	277084	348940	121765				
TSS				28778	26725	11519	16845	5878				
Free CN					0.61	0.28						
Total CN				14	15	7	5	2				
WAD CN					0.81	0.37						
CNO					670	303						
SCN					9	4						
Sulphate				20180	21323	9520	7183	2507				
Chloride				435260	325384	137768	150405	52485				
Total Ammonia				36	159	82	31	11				
Nitrate				43	714	322	14	5				
Nitrite				14	98	44	5	2				
Alkalinity				197845	120519	54110	63772	22254				
OrthoPhosphate-P				5	21	10	2	1				
Phosphate-P				119	99	54	47	16				
Org. Carbon				39569	23671	14475	12032	4199				
Hardness CaCO3				327344	203744	85846	105885	36950				
Total Metals												
Aluminum Al				239	275	156	174	61				
Antimony Sb				2.6	5.4	6.1	1.1	0.4				
Arsenic As				3.4	2.1	0.8	0.9	0.3				
Barium Ba				21	15	6	7	3				
Beryllium Be				0.04	0.09	0.04	0.01	0.00				
Bismuth Bi				0.22	1.72	0.77	0.07	0.03				
Boron B				247	105	46	54	19				
Cadmium Cd				0.02	0.02	0.01	0.00	0.00				
Calcium Ca				60936	58848	25398	17599	6141				
Chromium Cr				5	2	1	1	0				
Cobalt Co				0.33	1.60	2.12	0.18	0.06				
Copper Cu				9	8	3	4	1				
Iron Fe				367	568	164	217	76				
Lead Pb				0.13	0.32	0.09	0.09	0.03				
Lithium Li				20	13	6	7	2				
Magnesium Mg				52519	30552	13036	15586	5439				
Manganese Mn				47	96	26	24	9				
Mercury Hg				0.00	0.00	0.00	0.00	0.00				
Molybdenum Mo				1.13	1.52	0.72	0.39	0.13				
Nickel Ni				2.91	3.40	1.26	1.04	0.36				
Phosphorus P				119	108	58	47	16				
Potassium K				20288	14755	6316	5631	1965				
Selenium Se				6.46	2.63	1.20	1.34	0.47				
Silicon SiO2				3597	2687	1148	1203	420				
Silver Ag				0.01	0.02	0.01	0.00	0.00				
Sodium Na				282739	156679	70222	77328	26984				
Strontium Sr				292	198	72	96	34				
Tellurium Te				360	230	97	120	42				
Thallium Tl				0.22	0.14	0.06	0.07	0.03				
Thorium Th					0.00	0.00						
Tin Sn				2.88	2.05	0.87	0.96	0.34				
Titanium Ti				43	28	12	14	5				
Uranium U				0.18	0.14	0.08	0.08	0.03				
Vanadium V				3.96	0.61	0.63	0.33	0.12				
Zinc Zn				6.47	16.46	6.41	4.08	1.42				
Zirconium Zr				36	23	10	12	4				

Table H 7-A-3
Scenario 7

Solute Loadings in DSolute Loadings in DORIS CREEK D/S of waterfall (kg/month)

Date	Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter												
TDS				1221548	541020	288681	348940	153041				
TSS				29732	26214	11542	16845	6034				
Free CN				1.07		0.27		0.15				
Total CN				25	9	6	5	3				
WAD CN				1.43		0.35		0.21				
CNO				1178		292		170				
SCN				16		4		2				
Sulphate				36429	12103	9384	7183	4854				
Chloride				574298	269952	144852	150405	72812				
Total Ammonia				253	36	80	31	42				
Nitrate				1252	27	311	14	179				
Nitrite				171	9	42	5	24				
Alkalinity				211011	113224	54163	63772	24249				
OrthoPhosphate-P				37	3	9	2	5				
Phosphate-P				152	80	54	47	21				
Org. Carbon				41054	22868	14501	12032	4436				
Hardness CaCO3				350670	190751	85869	105885	40443				
Total Metals												
Aluminum Al				256	266	157	174	64				
Antimony Sb				5.5	3.7	6.1	1.1	0.8				
Arsenic As				3.9	1.8	0.8	0.9	0.4				
Barium Ba				23	14	6	7	3				
Beryllium Be				0.18	0.01	0.04	0.01	0.02				
Bismuth Bi				3.01	0.13	0.75	0.07	0.43				
Boron B				255	100	46	54	20				
Cadmium Cd				0.03	0.01	0.01	0.00	0.00				
Calcium Ca				107160	34848	25772	17599	12822				
Chromium Cr				6	1	1	1	0				
Cobalt Co				2.08	0.60	2.10	0.18	0.32				
Copper Cu				10	7	3	4	2				
Iron Fe				387	558	165	217	80				
Lead Pb				0.22	0.27	0.09	0.09	0.04				
Lithium Li				22	12	6	7	3				
Magnesium Mg				54852	29271	13057	15586	5799				
Manganese Mn				53	93	26	24	9				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				2.61	0.68	0.71	0.39	0.35				
Nickel Ni				4.43	2.53	1.25	1.04	0.59				
Phosphorus P				168	80	57	47	24				
Potassium K				27289	10798	6273	5631	2985				
Selenium Se				6.62	2.55	1.21	1.34	0.49				
Silicon SiO2				4414	2231	1149	1203	542				
Silver Ag				0.04	0.00	0.01	0.00	0.01				
Sodium Na				321177	147693	74438	77328	32693				
Strontium Sr				311	187	72	96	36				
Tellurium Te				372	223	97	120	44				
Thallium Tl				0.23	0.13	0.06	0.07	0.03				
Thorium Th				0.01		0.00		0.00				
Tin Sn				3.35	1.78	0.87	0.96	0.40				
Titanium Ti				45	27	12	14	5				
Uranium U				0.20	0.13	0.08	0.08	0.03				
Vanadium V				4.71	0.20	0.64	0.33	0.23				
Zinc Zn				10.66	14.10	6.39	4.08	2.04				
Zirconium Zr				37	22	10	12	4				

Table H 7-A-3
Scenario 7**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter												
TDS				1211704	541020	286220	348940	121765				
TSS				29797	26214	11558	16845	5878				
Free CN				1.01		0.25						
Total CN				25	9	6	5	2				
WAD CN				1.34		0.33						
CNO				1109		274						
SCN				15		4						
Sulphate				35524	12103	9158	7183	2507				
Chloride				568173	269952	143319	150405	52485				
Total Ammonia				240	36	77	31	11				
Nitrate				1180	27	293	14	5				
Nitrite				162	9	40	5	2				
Alkalinity				210901	113224	54135	63772	22254				
OrthoPhosphate-P				35	3	9	2	1				
Phosphate-P				151	80	53	47	16				
Org. Carbon				41120	22868	14518	12032	4199				
Hardness CaCO3				350205	190751	85752	105885	36950				
Total Metals												
Aluminum Al				259	266	158	174	61				
Antimony Sb				5.4	3.7	6.0	1.1	0.4				
Arsenic As				3.9	1.8	0.8	0.9	0.3				
Barium Ba				22	14	6	7	3				
Beryllium Be				0.18	0.01	0.04	0.01	0.00				
Bismuth Bi				2.84	0.13	0.71	0.07	0.03				
Boron B				256	100	46	54	19				
Cadmium Cd				0.03	0.01	0.01	0.00	0.00				
Calcium Ca				104607	34848	25135	17599	6141				
Chromium Cr				6	1	1	1	0				
Cobalt Co				1.98	0.60	2.08	0.18	0.06				
Copper Cu				10	7	3	4	1				
Iron Fe				391	558	166	217	76				
Lead Pb				0.21	0.27	0.09	0.09	0.03				
Lithium Li				22	12	6	7	2				
Magnesium Mg				54878	29271	13063	15586	5439				
Manganese Mn				52	93	26	24	9				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				2.53	0.68	0.69	0.39	0.13				
Nickel Ni				4.36	2.53	1.23	1.04	0.36				
Phosphorus P				165	80	57	47	16				
Potassium K				26958	10798	6190	5631	1965				
Selenium Se				6.64	2.55	1.21	1.34	0.47				
Silicon SiO2				4398	2231	1145	1203	420				
Silver Ag				0.04	0.00	0.01	0.00	0.00				
Sodium Na				320081	147693	74162	77328	26984				
Strontium Sr				311	187	72	96	34				
Tellurium Te				372	223	97	120	42				
Thallium Tl				0.23	0.13	0.06	0.07	0.03				
Thorium Th				0.01		0.00						
Tin Sn				3.33	1.78	0.86	0.96	0.34				
Titanium Ti				45	27	12	14	5				
Uranium U				0.20	0.13	0.08	0.08	0.03				
Vanadium V				4.71	0.20	0.63	0.33	0.12				
Zinc Zn				10.49	14.10	6.34	4.08	1.42				
Zirconium Zr				37	22	10	12	4				

Table H 7-A-3
Scenario 7**Solute Loadings in D/Solute Loadings in DORIS CREEK D/S of waterfall (kg/month)**

Date	Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16	Year 10 Jan-17
Parameter												
TDS				2065468	1004665	485846	647976	255005				
TSS				54520	48680	21263	31282	11105				
Free CN				0.95		0.23		0.14				
Total CN				36	17	9	9	5				
WAD CN				1.26		0.31		0.18				
CNO				1042		258		150				
SCN				14		4		2				
Sulphate				51956	22476	13542	13339	6757				
Chloride				935331	501297	236528	279300	116349				
Total Ammonia				259	66	97	58	48				
Nitrate				1149	50	286	27	163				
Nitrite				165	17	41	9	23				
Alkalinity				380340	210255	97732	118423	43375				
OrthoPhosphate-P				38	6	10	3	5				
Phosphate-P				251	148	92	87	35				
Org. Carbon				75091	42465	26645	22344	8072				
Hardness CaCO3				630283	354222	154282	196627	72096				
Total Metals												
Aluminum Al				467	495	289	322	117				
Antimony Sb				7.4	6.9	10.6	2.0	1.1				
Arsenic As				6.8	3.3	1.4	1.6	0.6				
Barium Ba				40	26	11	14	5				
Beryllium Be				0.21	0.02	0.05	0.01	0.02				
Bismuth Bi				2.87	0.25	0.72	0.13	0.40				
Boron B				468	186	83	100	36				
Cadmium Cd				0.04	0.02	0.01	0.01	0.00				
Calcium Ca				154396	64713	36819	32682	17396				
Chromium Cr				10	2	2	1	1				
Cobalt Co				2.17	1.12	3.49	0.33	0.34				
Copper Cu				18	13	5	7	3				
Iron Fe				709	1036	305	404	146				
Lead Pb				0.32	0.50	0.15	0.16	0.07				
Lithium Li				39	23	10	13	5				
Magnesium Mg				99908	54356	23764	28943	10488				
Manganese Mn				93	172	48	45	16				
Mercury Hg				0.01	0.00	0.00	0.00	0.00				
Molybdenum Mo				3.43	1.27	0.97	0.72	0.44				
Nickel Ni				6.78	4.71	1.96	1.93	0.88				
Phosphorus P				264	148	95	87	37				
Potassium K				44029	20052	10003	10457	4588				
Selenium Se				12.19	4.73	2.22	2.48	0.90				
Silicon SiO2				7466	4143	1953	2234	902				
Silver Ag				0.05	0.01	0.01	0.00	0.01				
Sodium Na				561329	274263	129543	143597	55662				
Strontium Sr				561	348	130	179	65				
Tellurium Te				681	414	178	223	80				
Thallium Tl				0.41	0.25	0.11	0.13	0.05				
Thorium Th				0.01		0.00		0.00				
Tin Sn				5.77	3.31	1.50	1.79	0.69				
Titanium Ti				83	50	22	27	10				
Uranium U				0.35	0.25	0.14	0.14	0.05				
Vanadium V				8.10	0.37	1.02	0.62	0.34				
Zinc Zn				15.86	26.18	10.88	7.57	3.21				
Zirconium Zr				68	41	18	22	8				

Table H-7-A-1
Scenario 7

OUTPUT SUMMARY							Fraction of CCME in Doris Creek (%)
Discharge rate		m3/year					
Degradation None		Tail Lk Cu < CME Year		34			
		MMER	CCME	Tail Lake Year 2	Doris Creek Year 8	L'Roberts L Year 8	
Maximum Concentration							
pH			6 to 9	7 to 8	7 to 8	7 to 8	
TDS	mg/L			646	172	178	
TSS	mg/L			5.0	7.0	8.1	
Free CN	mg/L		0.005	0.0052	0.00017	0.00009	3%
Total CN	mg/L	1.0		0.051	0.004	0.003	
WAD CN	mg/L			0.0069	0.0002	0.0001	
CNO	mg/L			5.7	0.19	0.10	
SCN	mg/L			0.078	0.003	0.001	
Sulphate	mg/L			72	5.5	5.8	
Chloride	mg/L			419	82	77	
Total Ammonia	mg/L		0.97	0.86	0.047	0.025	5%
Nitrate	mg/L		2.9	4.7	0.20	0.11	7%
Nitrite	mg/L		0.018	0.64	0.027	0.015	149%
Alkalinity	mg/L			48	28	26	
OrthoPhosphate-P	mg/L			0.1328	0.0059	0.0037	
Phosphate-P	mg/L			0.1361	0.0273	0.0263	
Org. Carbon	mg/L			6.6	7.5	7.1	
Hardness CaCO3	mg/L			90	47	46	
Total Metals							
Aluminum Al	mg/L		0.1	0.16	0.08	0.25	84%
Antimony Sb	mg/L			0.0122	0.0031	0.0019	
Arsenic As	mg/L	0.5	0.005	0.00	0.0005	0.0005	10%
Barium Ba	mg/L			0.0085	0.0033	0.0052	
Beryllium Be	mg/L			0.00051	0.00003	0.00002	
Bismuth Bi	mg/L			0.01167	0.00048	0.00033	
Boron B	mg/L			0.036	0.035	0.030	
Cadmium Cd	mg/L		0.000038	0.000044	0.0000039	0.0000153	10%
Calcium Ca	mg/L			194	14	11	
Chromium Cr	mg/L		0.001	0.0052	0.001	0.001	77%
Cobalt Co	mg/L			0.0081	0.0011	0.0005	
Copper Cu	mg/L	0.3	0.002	0.007	0.0017	0.0020	85%
Iron Fe	mg/L		0.3	0.18	0.13	0.28	42%
Lead Pb	mg/L	0.2	0.002	0.00033	0.00007	0.00026	3%
Lithium Li	mg/L			0.0056	0.0030	0.0029	
Magnesium Mg	mg/L			8.1	7.3	7.3	
Manganese Mn	mg/L			0.022	0.021	0.024	
Mercury Hg	mg/L		0.0001	0.0000124	0.0000012	0.0000009	1%
Molybdenum Mo	mg/L		0.073	0.0070	0.00039	0.00033	1%
Nickel Ni	mg/L	0.5	0.025	0.007	0.0007	0.0007	3%
Phosphorus P	mg/L			0.201	0.029	0.027	
Potassium K	mg/L			32	3.6	3.2	
Selenium Se	mg/L		0.001	0.00101	0.00090	0.00084	90%
Silicon SiO2	mg/L			3.2	0.61	0.57	
Silver Ag	mg/L		0.0001	0.00011	0.0000069	0.0000057	7%
Sodium Na	mg/L			116	43	40	
Strontium Sr	mg/L			0.073	0.043	0.047	
Tellurium Te	mg/L			0.054	0.050	0.052	
Thallium Tl	mg/L		0.0008	0.000040	0.000031	0.002001	4%
Thorium Th	mg/L			0.000047	0.0000025	0.0000013	
Tin Sn	mg/L			0.00186	0.00045	0.00004	
Titanium Ti	mg/L			0.0141	0.0064	0.0064	
Uranium U	mg/L			0.000079	0.000040	0.000044	
Vanadium V	mg/L			0.0028	0.0006	0.0005	
Zinc Zn	mg/L	0.5	0.03	0.018	0.0035	0.0055	12%
Zirconium Zr	mg/L			0.0056	0.0050	0.0052	

Table H-8-A-1

Table H-7-A-2
Scenario 7

Water Quality in Little Roberst Lake Outflow

Date		Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter													
TDS	mg/L				150	150	140	160	160				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				3.8	3.7	4.7	4.4	4.4				
Chloride	mg/L				61	58	57	65	65				
Total Ammonia	mg/L				0.006	0.006	0.001	0.008	0.008				
Nitrate	mg/L				0.01	0.01	0.01	0.01	0.01				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0010	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0160	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00000	0.00001	0.00000	0.00000				
Bismuth Bi	mg/L				0.00010	0.00010	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000026	0.0000042	0.0000147	0.0000022	0.0000022				
Calcium Ca	mg/L				8	7	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00016	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0005	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.2	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000035	0.0000008	0.0000032	0.0000015	0.0000015				
Sodium Na	mg/L				37	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000000	0.000000	0.000000	0.000000	0.000000				
Tin Sn	mg/L				0.00000	0.00000	0.00000	0.00000	0.00000				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000036	0.000032	0.000034	0.000043	0.000043				
Vanadium V	mg/L				0.0004	0.0001	0.0004	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-7-A-2
Scenario 7

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter													
TDS	mg/L				150	150	140	160	160				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				3.8	3.7	4.7	4.5	4.5				
Chloride	mg/L				61	58	57	65	65				
Total Ammonia	mg/L				0.007	0.007	0.002	0.009	0.009				
Nitrate	mg/L				0.02	0.02	0.01	0.02	0.02				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0010	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0160	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00000	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00010	0.00010	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000028	0.0000044	0.0000149	0.0000024	0.0000024				
Calcium Ca	mg/L				8	7	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00016	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0005	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.2	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000038	0.0000010	0.0000034	0.0000018	0.0000018				
Sodium Na	mg/L				37	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00000	0.00000	0.00000	0.00000	0.00000				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-7-A-2
Scenario 7

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

		Year 3	Year 3	Year 3	Year 3	Year 3	Year 3	Year 3	Year 3	Year 3	Year 3	Year 3	
Date		Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10
Parameter													
TDS	mg/L				150	150	140	160	160				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				3.8	3.7	4.7	4.5	4.5				
Chloride	mg/L				61	58	57	65	65				
Total Ammonia	mg/L				0.007	0.007	0.002	0.009	0.009				
Nitrate	mg/L				0.02	0.02	0.01	0.02	0.02				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0010	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0160	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00000	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00010	0.00010	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000028	0.0000044	0.0000149	0.0000024	0.0000024				
Calcium Ca	mg/L				8	7	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00016	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0005	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.2	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000038	0.0000010	0.0000034	0.0000018	0.0000018				
Sodium Na	mg/L				37	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00000	0.00000	0.00000	0.00000	0.00000				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-7-A-2
Scenario 7

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter													
TDS	mg/L				150	150	140	160	160				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				3.8	3.7	4.7	4.5	4.5				
Chloride	mg/L				61	58	57	65	65				
Total Ammonia	mg/L				0.007	0.007	0.002	0.009	0.009				
Nitrate	mg/L				0.02	0.02	0.01	0.02	0.02				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0010	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0160	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00000	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00010	0.00010	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000028	0.0000044	0.0000149	0.0000024	0.0000024				
Calcium Ca	mg/L				8	7	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00016	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0005	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.2	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000038	0.0000010	0.0000034	0.0000018	0.0000018				
Sodium Na	mg/L				37	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00000	0.00000	0.00000	0.00000	0.00000				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-7-A-2
Scenario 7

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter													
TDS	mg/L				150	150	140	160	160				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				3.8	3.7	4.7	4.5	4.5				
Chloride	mg/L				61	58	57	65	65				
Total Ammonia	mg/L				0.007	0.007	0.002	0.009	0.009				
Nitrate	mg/L				0.02	0.02	0.01	0.02	0.02				
Nitrite	mg/L				0.002	0.002	0.000	0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0010	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0160	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00000	0.00001	0.00001	0.00001				
Bismuth Bi	mg/L				0.00010	0.00010	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000028	0.0000044	0.0000149	0.0000024	0.0000024				
Calcium Ca	mg/L				8	7	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00016	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0005	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.2	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000038	0.0000010	0.0000034	0.0000018	0.0000018				
Sodium Na	mg/L				37	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L				0.000001	0.000001	0.000001	0.000001	0.000001				
Tin Sn	mg/L				0.00000	0.00000	0.00000	0.00000	0.00000				
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000036	0.000032	0.000035	0.000043	0.000043				
Vanadium V	mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-7-A-2
Scenario 7

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter													
TDS	mg/L				150	150	140	160	160				
TSS	mg/L				7.0	8.0	4.0	5.0	5.0				
Free CN	mg/L												
Total CN	mg/L				0.002	0.002	0.002	0.002	0.002				
WAD CN	mg/L												
CNO	mg/L												
SCN	mg/L												
Sulphate	mg/L				3.8	3.7	4.7	4.4	4.4				
Chloride	mg/L				61	58	57	65	65				
Total Ammonia	mg/L				0.005	0.005		0.007	0.007				
Nitrate	mg/L				0.01	0.01		0.01	0.01				
Nitrite	mg/L				0.002	0.002		0.002	0.002				
Alkalinity	mg/L				23	23	24	25	25				
OrthoPhosphate-P	mg/L				0.0010	0.0010	0.0010	0.0010	0.0010				
Phosphate-P	mg/L				0.0240	0.0160	0.0070	0.0190	0.0190				
Org. Carbon	mg/L				6.0	4.0	7.0	5.0	5.0				
Hardness CaCO3	mg/L				43	38	40	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0004	0.0017	0.0012	0.0006	0.0006				
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0051	0.0034	0.0044	0.0042	0.0042				
Beryllium Be	mg/L				0.00001	0.00000	0.00000	0.00000	0.00000				
Bismuth Bi	mg/L				0.00010	0.00010	0.00010	0.00010	0.00010				
Boron B	mg/L				0.029	0.020	0.028	0.026	0.026				
Cadmium Cd	mg/L				0.0000024	0.0000040	0.0000145	0.0000020	0.0000020				
Calcium Ca	mg/L				8	7	7	7	7				
Chromium Cr	mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0001	0.0003	0.0004	0.0001	0.0001				
Copper Cu	mg/L				0.0012	0.0013	0.0016	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg	mg/L				7.0	5.0	5.2	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.012	0.008	0.008				
Mercury Hg	mg/L				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00018	0.00016	0.00024	0.00020	0.00020				
Nickel Ni	mg/L				0.0006	0.0005	0.0006	0.0006	0.0006				
Phosphorus P	mg/L				0.024	0.016	0.007	0.019	0.019				
Potassium K	mg/L				2.7	2.2	2.2	2.5	2.5				
Selenium Se	mg/L				0.00064	0.00037	0.00082	0.00059	0.00059				
Silicon SiO2	mg/L				0.50	0.50	0.50	0.50	0.50				
Silver Ag	mg/L				0.0000032	0.0000005	0.0000029	0.0000013	0.0000013				
Sodium Na	mg/L				37	31	34	36	36				
Strontium Sr	mg/L				0.044	0.037	0.039	0.045	0.045				
Tellurium Te	mg/L				0.050	0.050	0.050	0.050	0.050				
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002000				
Thorium Th	mg/L												
Tin Sn	mg/L												
Titanium Ti	mg/L				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U	mg/L				0.000035	0.000031	0.000034	0.000042	0.000042				
Vanadium V	mg/L				0.0004	0.0001	0.0004	0.0003	0.0003				
Zinc Zn	mg/L				0.0035	0.0017	0.0015	0.0051	0.0051				
Zirconium Zr	mg/L				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H-7-A-2
Scenario 7

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date	Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter												
TDS mg/L				150	159	151	160	160				
TSS mg/L				7.0	8.1	4.1	5.0	5.0				
Free CN mg/L					0.00007	0.00007						
Total CN mg/L				0.002	0.003	0.003	0.002	0.002				
WAD CN mg/L					0.0001	0.0001						
CNO mg/L					0.07	0.08						
SCN mg/L					0.001	0.001						
Sulphate mg/L				3.8	4.7	5.7	4.4	4.4				
Chloride mg/L				61	64	64	65	65				
Total Ammonia mg/L				0.005	0.018	0.014	0.007	0.007				
Nitrate mg/L				0.01	0.08	0.08	0.01	0.01				
Nitrite mg/L				0.002	0.012	0.010	0.002	0.002				
Alkalinity mg/L				23	24	25	25	25				
OrthoPhosphate-P mg/L				0.0010	0.0030	0.0031	0.0010	0.0010				
Phosphate-P mg/L				0.0240	0.0181	0.0092	0.0190	0.0190				
Org. Carbon mg/L				6.0	4.1	7.1	5.0	5.0				
Hardness CaCO3 mg/L				43	39	42	44	44				
Total Metals												
Aluminum Al mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb mg/L				0.0004	0.0019	0.0014	0.0006	0.0006				
Arsenic As mg/L				0.0004	0.0004	0.0005	0.0004	0.0004				
Barium Ba mg/L				0.0051	0.0035	0.0045	0.0042	0.0042				
Beryllium Be mg/L				0.00001	0.00001	0.00001	0.00000	0.00000				
Bismuth Bi mg/L				0.00010	0.00027	0.00029	0.00010	0.00010				
Boron B mg/L				0.029	0.020	0.029	0.026	0.026				
Cadmium Cd mg/L				0.0000024	0.0000047	0.0000153	0.0000020	0.0000020				
Calcium Ca mg/L				8	9	10	7	7				
Chromium Cr mg/L				0.000	0.000	0.001	0.000	0.000				
Cobalt Co mg/L				0.0001	0.0004	0.0005	0.0001	0.0001				
Copper Cu mg/L				0.0012	0.0014	0.0017	0.0018	0.0018				
Iron Fe mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb mg/L				0.00007	0.00005	0.00010	0.00025	0.00025				
Lithium Li mg/L				0.0028	0.0029	0.0029	0.0028	0.0028				
Magnesium Mg mg/L				7.0	5.1	5.3	7.1	7.1				
Manganese Mn mg/L				0.024	0.009	0.013	0.008	0.008				
Mercury Hg mg/L				0.0000006	0.0000007	0.0000007	0.0000006	0.0000006				
Molybdenum Mo mg/L				0.00018	0.00026	0.00033	0.00020	0.00020				
Nickel Ni mg/L				0.0006	0.0006	0.0007	0.0006	0.0006				
Phosphorus P mg/L				0.024	0.019	0.010	0.019	0.019				
Potassium K mg/L				2.7	2.6	2.6	2.5	2.5				
Selenium Se mg/L				0.00064	0.00037	0.00083	0.00059	0.00059				
Silicon SiO2 mg/L				0.50	0.55	0.55	0.50	0.50				
Silver Ag mg/L				0.0000032	0.0000026	0.0000052	0.0000013	0.0000013				
Sodium Na mg/L				37	32	35	36	36				
Strontium Sr mg/L				0.044	0.038	0.040	0.045	0.045				
Tellurium Te mg/L				0.050	0.051	0.051	0.050	0.050				
Thallium Tl mg/L				0.000100	0.000301	0.000301	0.002000	0.002000				
Thorium Th mg/L					0.000000	0.000001						
Tin Sn mg/L					0.00003	0.00003						
Titanium Ti mg/L				0.0060	0.0061	0.0061	0.0060	0.0060				
Uranium U mg/L				0.000035	0.000032	0.000035	0.000042	0.000042				
Vanadium V mg/L				0.0004	0.0001	0.0005	0.0003	0.0003				
Zinc Zn mg/L				0.0035	0.0019	0.0018	0.0051	0.0051				
Zirconium Zr mg/L				0.0050	0.0051	0.0051	0.0050	0.0050				

Table H-7-A-2
Scenario 7

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter													
TDS	mg/L				165	150	154	160	178				
TSS	mg/L				7.1	8.0	4.1	5.0	5.1				
Free CN	mg/L				0.00007		0.00007		0.00009				
Total CN	mg/L				0.003	0.002	0.003	0.002	0.003				
WAD CN	mg/L				0.0001		0.0001		0.0001				
CNO	mg/L				0.08		0.08		0.10				
SCN	mg/L				0.001		0.001		0.001				
Sulphate	mg/L				4.9	3.7	5.7	4.4	5.8				
Chloride	mg/L				70	58	66	65	77				
Total Ammonia	mg/L				0.020	0.005	0.014	0.007	0.025				
Nitrate	mg/L				0.09	0.01	0.08	0.01	0.11				
Nitrite	mg/L				0.013	0.002	0.010	0.002	0.015				
Alkalinity	mg/L				24	23	25	25	26				
OrthoPhosphate-P	mg/L				0.0032	0.0010	0.0031	0.0010	0.0037				
Phosphate-P	mg/L				0.0263	0.0160	0.0092	0.0190	0.0218				
Org. Carbon	mg/L				6.1	4.0	7.1	5.0	5.1				
Hardness CaCO3	mg/L				45	38	42	44	46				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0006	0.0017	0.0013	0.0006	0.0009				
Arsenic As	mg/L				0.0005	0.0003	0.0005	0.0004	0.0005				
Barium Ba	mg/L				0.0052	0.0034	0.0045	0.0042	0.0043				
Beryllium Be	mg/L				0.00002	0.00000	0.00001	0.00000	0.00002				
Bismuth Bi	mg/L				0.00029	0.00010	0.00028	0.00010	0.00033				
Boron B	mg/L				0.030	0.020	0.029	0.026	0.027				
Cadmium Cd	mg/L				0.0000032	0.0000040	0.0000153	0.0000020	0.0000030				
Calcium Ca	mg/L				11	7	10	7	11				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0003	0.0003	0.0005	0.0001	0.0003				
Copper Cu	mg/L				0.0013	0.0013	0.0017	0.0018	0.0020				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00026				
Lithium Li	mg/L				0.0029	0.0028	0.0029	0.0028	0.0029				
Magnesium Mg	mg/L				7.1	5.0	5.3	7.1	7.3				
Manganese Mn	mg/L				0.024	0.008	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000007	0.0000006	0.0000007	0.0000006	0.0000008				
Molybdenum Mo	mg/L				0.00028	0.00016	0.00033	0.00020	0.00032				
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0007				
Phosphorus P	mg/L				0.027	0.016	0.010	0.019	0.023				
Potassium K	mg/L				3.2	2.2	2.6	2.5	3.1				
Selenium Se	mg/L				0.00065	0.00037	0.00083	0.00059	0.00061				
Silicon SiO2	mg/L				0.56	0.50	0.55	0.50	0.57				
Silver Ag	mg/L				0.0000055	0.0000005	0.0000052	0.0000013	0.0000043				
Sodium Na	mg/L				40	31	36	36	39				
Strontium Sr	mg/L				0.045	0.037	0.040	0.045	0.047				
Tellurium Te	mg/L				0.051	0.050	0.051	0.050	0.051				
Thallium Tl	mg/L				0.000101	0.000300	0.000301	0.002000	0.002001				
Thorium Th	mg/L				0.000001		0.000001		0.000001				
Tin Sn	mg/L				0.00003		0.00003		0.00004				
Titanium Ti	mg/L				0.0061	0.0060	0.0061	0.0060	0.0062				
Uranium U	mg/L				0.000036	0.000031	0.000035	0.000042	0.000044				
Vanadium V	mg/L				0.0005	0.0001	0.0005	0.0003	0.0004				
Zinc Zn	mg/L				0.0037	0.0017	0.0018	0.0051	0.0055				
Zirconium Zr	mg/L				0.0051	0.0050	0.0051	0.0050	0.0051				

Table H-7-A-2
Scenario 7

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter													
TDS	mg/L				164	150	153	160	160				
TSS	mg/L				7.1	8.0	4.1	5.0	5.0				
Free CN	mg/L				0.00007		0.00006						
Total CN	mg/L				0.003	0.002	0.003	0.002	0.002				
WAD CN	mg/L				0.0001		0.0001						
CNO	mg/L				0.08		0.07						
SCN	mg/L				0.001		0.001						
Sulphate	mg/L				4.8	3.7	5.6	4.4	4.4				
Chloride	mg/L				70	58	66	65	65				
Total Ammonia	mg/L				0.019	0.005	0.013	0.007	0.007				
Nitrate	mg/L				0.08	0.01	0.07	0.01	0.01				
Nitrite	mg/L				0.012	0.002	0.009	0.002	0.002				
Alkalinity	mg/L				24	23	25	25	25				
OrthoPhosphate-P	mg/L				0.0030	0.0010	0.0029	0.0010	0.0010				
Phosphate-P	mg/L				0.0262	0.0160	0.0091	0.0190	0.0190				
Org. Carbon	mg/L				6.1	4.0	7.1	5.0	5.0				
Hardness CaCO3	mg/L				45	38	42	44	44				
Total Metals													
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15				
Antimony Sb	mg/L				0.0006	0.0017	0.0013	0.0006	0.0006				
Arsenic As	mg/L				0.0005	0.0003	0.0005	0.0004	0.0004				
Barium Ba	mg/L				0.0052	0.0034	0.0045	0.0042	0.0042				
Beryllium Be	mg/L				0.00002	0.00000	0.00001	0.00000	0.00000				
Bismuth Bi	mg/L				0.00028	0.00010	0.00027	0.00010	0.00010				
Boron B	mg/L				0.030	0.020	0.029	0.026	0.026				
Cadmium Cd	mg/L				0.0000032	0.0000040	0.0000152	0.0000020	0.0000020				
Calcium Ca	mg/L				11	7	10	7	7				
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000				
Cobalt Co	mg/L				0.0003	0.0003	0.0005	0.0001	0.0001				
Copper Cu	mg/L				0.0013	0.0013	0.0017	0.0018	0.0018				
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16				
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025				
Lithium Li	mg/L				0.0029	0.0028	0.0029	0.0028	0.0028				
Magnesium Mg	mg/L				7.1	5.0	5.3	7.1	7.1				
Manganese Mn	mg/L				0.024	0.008	0.013	0.008	0.008				
Mercury Hg	mg/L				0.0000007	0.0000006	0.0000007	0.0000006	0.0000006				
Molybdenum Mo	mg/L				0.00028	0.00016	0.00033	0.00020	0.00020				
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006				
Phosphorus P	mg/L				0.027	0.016	0.010	0.019	0.019				
Potassium K	mg/L				3.1	2.2	2.6	2.5	2.5				
Selenium Se	mg/L				0.00065	0.00037	0.00083	0.00059	0.00059				
Silicon SiO2	mg/L				0.55	0.50	0.55	0.50	0.50				
Silver Ag	mg/L				0.0000056	0.0000005	0.0000053	0.0000013	0.0000013				
Sodium Na	mg/L				40	31	36	36	36				
Strontium Sr	mg/L				0.045	0.037	0.040	0.045	0.045				
Tellurium Te	mg/L				0.051	0.050	0.051	0.050	0.050				
Thallium Tl	mg/L				0.000101	0.000300	0.000301	0.002000	0.002000				
Thorium Th	mg/L				0.000001		0.000001						
Tin Sn	mg/L				0.00003		0.00003						
Titanium Ti	mg/L				0.0061	0.0060	0.0062	0.0060	0.0060				
Uranium U	mg/L				0.000036	0.000031	0.000035	0.000042	0.000042				
Vanadium V	mg/L				0.0005	0.0001	0.0005	0.0003	0.0003				
Zinc Zn	mg/L				0.0037	0.0017	0.0018	0.0051	0.0051				
Zirconium Zr	mg/L				0.0051	0.0050	0.0051	0.0050	0.0050				

Table H-7-A-2
Scenario 7

Water Quality in Little Roberst Water Quality in Little Roberst Lake Outflow

Date		Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16
Parameter												
TDS	mg/L				157	150	147	160	169			
TSS	mg/L				7.0	8.0	4.0	5.0	5.1			
Free CN	mg/L				0.00003		0.00003		0.00004			
Total CN	mg/L				0.002	0.002		0.002				
WAD CN	mg/L				0.0000		0.0000		0.0001			
CNO	mg/L				0.04		0.04		0.05			
SCN	mg/L				0.001		0.000		0.001			
Sulphate	mg/L				4.3	3.7	5.2	4.4	5.1			
Chloride	mg/L				66	58	62	65	71			
Total Ammonia	mg/L				0.012	0.005	0.007	0.007	0.016			
Nitrate	mg/L				0.05	0.01	0.04	0.01	0.05			
Nitrite	mg/L				0.007	0.002	0.005	0.002	0.008			
Alkalinity	mg/L				23	23	24	25	26			
OrthoPhosphate-P	mg/L				0.0020	0.0010	0.0020	0.0010	0.0023			
Phosphate-P	mg/L				0.0251	0.0160	0.0081	0.0190	0.0204			
Org. Carbon	mg/L				6.1	4.0	7.1	5.0	5.1			
Hardness CaCO3	mg/L				44	38	41	44	45			
Total Metals												
Aluminum Al	mg/L				0.24	0.11	0.19	0.15	0.15			
Antimony Sb	mg/L				0.0005	0.0017	0.0013	0.0006	0.0007			
Arsenic As	mg/L				0.0004	0.0003	0.0005	0.0004	0.0004			
Barium Ba	mg/L				0.0052	0.0034	0.0045	0.0042	0.0042			
Beryllium Be	mg/L				0.00001	0.00000	0.00001	0.00000	0.00001			
Bismuth Bi	mg/L				0.00019	0.00010	0.00019	0.00010	0.00021			
Boron B	mg/L				0.030	0.020	0.028	0.026	0.027			
Cadmium Cd	mg/L				0.0000028	0.0000040	0.0000149	0.0000020	0.0000025			
Calcium Ca	mg/L				9	7	8	7	9			
Chromium Cr	mg/L				0.001	0.000	0.001	0.000	0.000			
Cobalt Co	mg/L				0.0002	0.0003	0.0004	0.0001	0.0002			
Copper Cu	mg/L				0.0012	0.0013	0.0017	0.0018	0.0019			
Iron Fe	mg/L				0.28	0.14	0.18	0.16	0.16			
Lead Pb	mg/L				0.00007	0.00005	0.00009	0.00025	0.00025			
Lithium Li	mg/L				0.0028	0.0028	0.0028	0.0028	0.0029			
Magnesium Mg	mg/L				7.0	5.0	5.3	7.1	7.2			
Manganese Mn	mg/L				0.024	0.008	0.013	0.008	0.008			
Mercury Hg	mg/L				0.0000007	0.0000006	0.0000007	0.0000006	0.0000007			
Molybdenum Mo	mg/L				0.00023	0.00016	0.00028	0.00020	0.00026			
Nickel Ni	mg/L				0.0007	0.0005	0.0007	0.0006	0.0006			
Phosphorus P	mg/L				0.026	0.016	0.009	0.019	0.021			
Potassium K	mg/L				2.9	2.2	2.4	2.5	2.8			
Selenium Se	mg/L				0.00065	0.00037	0.00083	0.00059	0.00060			
Silicon SiO2	mg/L				0.53	0.50	0.53	0.50	0.54			
Silver Ag	mg/L				0.0000045	0.0000005	0.0000042	0.0000013	0.0000030			
Sodium Na	mg/L				39	31	35	36	38			
Strontium Sr	mg/L				0.045	0.037	0.040	0.045	0.046			
Tellurium Te	mg/L				0.050	0.050	0.051	0.050	0.051			
Thallium Tl	mg/L				0.000100	0.000300	0.000300	0.002000	0.002001			
Thorium Th	mg/L				0.000000		0.000000		0.000001			
Tin Sn	mg/L				0.00002		0.00002		0.00002			
Titanium Ti	mg/L				0.0061	0.0060	0.0061	0.0060	0.0061			
Uranium U	mg/L				0.000036	0.000031	0.000035	0.000042	0.000043			
Vanadium V	mg/L				0.0005	0.0001	0.0005	0.0003	0.0003			
Zinc Zn	mg/L				0.0036	0.0017	0.0017	0.0051	0.0053			
Zirconium Zr	mg/L				0.0051	0.0050	0.0051	0.0050	0.0051			

Table H 7-A-3
Scenario 7

Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 1 Mar-07	Year 1 Apr-07	Year 1 May-07	Year 1 Jun-07	Year 1 Jul-07	Year 1 Aug-07	Year 1 Sep-07	Year 1 Oct-07	Year 1 Nov-07	Year 1 Dec-07	Year 1 Jan-08	Year 1 Feb-08
Parameter												
TDS				140	121	125	145	145				
TSS				4.0	5.9	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN												
Sulphate				2.8	2.7	2.9	3.0	3.0				
Chloride				61	61	59	63	63				
Total Ammonia				0.007	0.010	0.016	0.015	0.015				
Nitrate				0.02	0.02	0.02	0.02	0.02				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00000	0.00000	0.00000	0.00000				
Bismuth Bi				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000029	0.0000029	0.0000024	0.0000024	0.0000024				
Calcium Ca				8	8	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.018	0.024	0.020	0.020				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.50	0.50	0.50	0.50	0.50				
Silver Ag				0.0000014	0.0000016	0.0000012	0.0000013	0.0000013				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000009	0.0000009	0.0000009	0.0000009	0.0000009				
Tin Sn				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000031	0.000039	0.000032	0.000032				
Vanadium V				0.0006	0.0000	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0032	0.0028	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 7-A-3
Scenario 7

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 2 Feb-08	Year 2 Mar-08	Year 2 Apr-08	Year 2 May-08	Year 2 Jun-08	Year 2 Jul-08	Year 2 Aug-08	Year 2 Sep-08	Year 2 Oct-08	Year 2 Nov-08	Year 2 Dec-08	Year 2 Jan-09
Parameter												
TDS				140	121	125	145	145				
TSS				4.0	5.9	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN												
Sulphate				2.8	2.7	2.9	3.0	3.0				
Chloride				61	61	59	63	63				
Total Ammonia				0.008	0.011	0.017	0.016	0.016				
Nitrate				0.03	0.03	0.03	0.03	0.03				
Nitrite				0.003	0.003	0.003	0.003	0.003				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca				9	8	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.018	0.024	0.020	0.020				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.51	0.51	0.51	0.51	0.51				
Silver Ag				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000017	0.0000017	0.0000017	0.0000017	0.0000017				
Tin Sn				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 7-A-3
Scenario 7

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 3 Mar-09	Year 3 Apr-09	Year 3 May-09	Year 3 Jun-09	Year 3 Jul-09	Year 3 Aug-09	Year 3 Sep-09	Year 3 Oct-09	Year 3 Nov-09	Year 3 Dec-09	Year 3 Jan-10	Year 3 Feb-10
Parameter												
TDS				140	121	125	145	145				
TSS				4.0	5.9	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN												
Sulphate				2.8	2.7	2.9	3.0	3.0				
Chloride				61	61	59	63	63				
Total Ammonia				0.008	0.011	0.017	0.016	0.016				
Nitrate				0.03	0.03	0.03	0.03	0.03				
Nitrite				0.003	0.003	0.003	0.003	0.003				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca				9	8	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.018	0.024	0.020	0.020				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.51	0.51	0.51	0.51	0.51				
Silver Ag				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000017	0.0000017	0.0000017	0.0000017	0.0000017				
Tin Sn				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 7-A-3
Scenario 7

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 4 Mar-10	Year 4 Apr-10	Year 4 May-10	Year 4 Jun-10	Year 4 Jul-10	Year 4 Aug-10	Year 4 Sep-10	Year 4 Oct-10	Year 4 Nov-10	Year 4 Dec-10	Year 4 Jan-11	Year 4 Feb-11
Parameter												
TDS				140	121	125	145	145				
TSS				4.0	5.9	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN												
Sulphate				2.8	2.7	2.9	3.0	3.0				
Chloride				61	61	59	63	63				
Total Ammonia				0.008	0.011	0.017	0.016	0.016				
Nitrate				0.03	0.03	0.03	0.03	0.03				
Nitrite				0.003	0.003	0.003	0.003	0.003				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca				9	8	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.018	0.024	0.020	0.020				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.51	0.51	0.51	0.51	0.51				
Silver Ag				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000017	0.0000017	0.0000017	0.0000017	0.0000017				
Tin Sn				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 7-A-3
Scenario 7

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 5 Mar-11	Year 5 Apr-11	Year 5 May-11	Year 5 Jun-11	Year 5 Jul-11	Year 5 Aug-11	Year 5 Sep-11	Year 5 Oct-11	Year 5 Nov-11	Year 5 Dec-11	Year 5 Jan-12	Year 5 Feb-12
Parameter												
TDS				140	121	125	145	145				
TSS				4.0	5.9	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN												
Sulphate				2.8	2.7	2.9	3.0	3.0				
Chloride				61	61	59	63	63				
Total Ammonia				0.008	0.011	0.017	0.016	0.016				
Nitrate				0.03	0.03	0.03	0.03	0.03				
Nitrite				0.003	0.003	0.003	0.003	0.003				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00001	0.00001	0.00001	0.00001				
Bismuth Bi				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B				0.035	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000033	0.0000033	0.0000028	0.0000028	0.0000028				
Calcium Ca				9	8	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000007	0.0000007	0.0000007	0.0000007				
Molybdenum Mo				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.018	0.024	0.020	0.020				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.51	0.51	0.51	0.51	0.51				
Silver Ag				0.0000019	0.0000021	0.0000018	0.0000018	0.0000018				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000017	0.0000017	0.0000017	0.0000017	0.0000017				
Tin Sn				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000031	0.000039	0.000033	0.000033				
Vanadium V				0.0006	0.0001	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0032	0.0029	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 7-A-3
Scenario 7

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 6 Feb-12	Year 6 Mar-12	Year 6 Apr-12	Year 6 May-12	Year 6 Jun-12	Year 6 Jul-12	Year 6 Aug-12	Year 6 Sep-12	Year 6 Oct-12	Year 6 Nov-12	Year 6 Dec-12	Year 6 Jan-13
Parameter												
TDS				140	121	125	145	145				
TSS				4.0	5.9	6.0	7.0	7.0				
Free CN												
Total CN				0.002	0.002	0.002	0.002	0.002				
WAD CN												
CNO												
SCN												
Sulphate				2.8	2.7	2.8	3.0	3.0				
Chloride				61	61	59	63	63				
Total Ammonia				0.005	0.008	0.014	0.013	0.013				
Nitrate				0.01	0.01	0.01	0.01	0.01				
Nitrite				0.002	0.002	0.002	0.002	0.002				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0008	0.0008	0.0008	0.0008	0.0008				
Phosphate-P				0.0165	0.0179	0.0240	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.5	5.0	5.0				
Hardness CaCO3				46	43	43	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0008	0.0028	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0030	0.0031	0.0031				
Beryllium Be				0.00001	0.00000	0.00000	0.00000	0.00000				
Bismuth Bi				0.00003	0.00003	0.00003	0.00003	0.00003				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000025	0.0000025	0.0000020	0.0000020	0.0000020				
Calcium Ca				8	8	8	7	7				
Chromium Cr				0.001	0.000	0.000	0.000	0.000				
Cobalt Co				0.0000	0.0001	0.0009	0.0001	0.0001				
Copper Cu				0.0012	0.0015	0.0013	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000006	0.0000006	0.0000006	0.0000006	0.0000006				
Molybdenum Mo				0.00016	0.00015	0.00018	0.00016	0.00016				
Nickel Ni				0.0004	0.0006	0.0005	0.0004	0.0004				
Phosphorus P				0.017	0.018	0.024	0.020	0.020				
Potassium K				2.8	2.4	2.4	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.50	0.50	0.50	0.50	0.50				
Silver Ag				0.0000008	0.0000010	0.0000006	0.0000007	0.0000007				
Sodium Na				39	33	34	32	32				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th												
Tin Sn				0.00040	0.00040	0.00040	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000025	0.000030	0.000038	0.000031	0.000031				
Vanadium V				0.0006	0.0000	0.0002	0.0001	0.0001				
Zinc Zn				0.0009	0.0032	0.0028	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 7-A-3
Scenario 7

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 7 Mar-13	Year 7 Apr-13	Year 7 May-13	Year 7 Jun-13	Year 7 Jul-13	Year 7 Aug-13	Year 7 Sep-13	Year 7 Oct-13	Year 7 Nov-13	Year 7 Dec-13	Year 7 Jan-14	Year 7 Feb-14
Parameter												
TDS				140	135	141	145	145				
TSS				4.0	5.8	5.9	7.0	7.0				
Free CN					0.00013	0.00014						
Total CN				0.002	0.003	0.003	0.002	0.002				
WAD CN					0.0002	0.0002						
CNO					0.14	0.15						
SCN					0.002	0.002						
Sulphate				2.8	4.6	4.8	3.0	3.0				
Chloride				61	70	70	63	63				
Total Ammonia				0.005	0.034	0.042	0.013	0.013				
Nitrate				0.01	0.15	0.16	0.01	0.01				
Nitrite				0.002	0.021	0.022	0.002	0.002				
Alkalinity				28	26	28	27	27				
OrthoPhosphate-P				0.0008	0.0046	0.0049	0.0008	0.0008				
Phosphate-P				0.0165	0.0213	0.0273	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3				46	44	44	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0004	0.0012	0.0031	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0033	0.0031	0.0031	0.0031				
Beryllium Be				0.00001	0.00002	0.00002	0.00000	0.00000				
Bismuth Bi				0.00003	0.00037	0.00039	0.00003	0.00003				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000025	0.0000038	0.0000034	0.0000020	0.0000020				
Calcium Ca				8	13	13	7	7				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0000	0.0003	0.0011	0.0001	0.0001				
Copper Cu				0.0012	0.0017	0.0014	0.0015	0.0015				
Iron Fe				0.05	0.12	0.08	0.09	0.09				
Lead Pb				0.00002	0.00007	0.00005	0.00004	0.00004				
Lithium Li				0.0028	0.0029	0.0029	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000006	0.0000007	0.0000008	0.0000006	0.0000006				
Molybdenum Mo				0.00016	0.00033	0.00037	0.00016	0.00016				
Nickel Ni				0.0004	0.0007	0.0006	0.0004	0.0004				
Phosphorus P				0.017	0.023	0.029	0.020	0.020				
Potassium K				2.8	3.2	3.2	2.3	2.3				
Selenium Se				0.00090	0.00057	0.00061	0.00056	0.00056				
Silicon SiO2				0.50	0.58	0.58	0.50	0.50				
Silver Ag				0.0000008	0.0000051	0.0000051	0.0000007	0.0000007				
Sodium Na				39	34	36	32	32				
Strontium Sr				0.041	0.043	0.037	0.040	0.040				
Tellurium Te				0.050	0.049	0.049	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th					0.0000010	0.0000011						
Tin Sn				0.00040	0.00044	0.00044	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000025	0.000031	0.000039	0.000031	0.000031				
Vanadium V				0.0006	0.0001	0.0003	0.0001	0.0001				
Zinc Zn				0.0009	0.0035	0.0033	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 7-A-3
Scenario 7

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 8 Mar-14	Year 8 Apr-14	Year 8 May-14	Year 8 Jun-14	Year 8 Jul-14	Year 8 Aug-14	Year 8 Sep-14	Year 8 Oct-14	Year 8 Nov-14	Year 8 Dec-14	Year 8 Jan-15	Year 8 Feb-15
Parameter												
TDS				162	121	147	145	172				
TSS				3.9	5.9	5.9	7.0	6.8				
Free CN				0.00014		0.00013		0.00017				
Total CN				0.003	0.002	0.003	0.002	0.004				
WAD CN				0.0002		0.0002		0.0002				
CNO				0.16		0.15		0.19				
SCN				0.002		0.002		0.003				
Sulphate				4.8	2.7	4.8	3.0	5.5				
Chloride				76	61	74	63	82				
Total Ammonia				0.034	0.008	0.041	0.013	0.047				
Nitrate				0.17	0.01	0.16	0.01	0.20				
Nitrite				0.0227	0.0020	0.022	0.002	0.027				
Alkalinity				28	25	28	27	27				
OrthoPhosphate-P				0.0049	0.0008	0.0047	0.0008	0.0059				
Phosphate-P				0.0202	0.0179	0.0272	0.0195	0.0239				
Org. Carbon				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3				47	43	44	44	45				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0007	0.0008	0.0031	0.0005	0.0009				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0030	0.0032	0.0031	0.0031	0.0033				
Beryllium Be				0.00002	0.00000	0.00002	0.00000	0.00003				
Bismuth Bi				0.00040	0.00003	0.00038	0.00003	0.00048				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000039	0.0000025	0.0000034	0.0000020	0.0000038				
Calcium Ca				14	8	13	7	14				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0003	0.0001	0.0011	0.0001	0.0004				
Copper Cu				0.0014	0.0015	0.0014	0.0015	0.0017				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00003	0.00006	0.00005	0.00004	0.00005				
Lithium Li				0.0029	0.0028	0.0029	0.0028	0.0029				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000008	0.0000006	0.0000008	0.0000006	0.0000009				
Molybdenum Mo				0.00035	0.00015	0.00036	0.00016	0.00039				
Nickel Ni				0.0006	0.0006	0.0006	0.0004	0.0007				
Phosphorus P				0.022	0.018	0.029	0.020	0.026				
Potassium K				3.6	2.4	3.2	2.3	3.4				
Selenium Se				0.00088	0.00057	0.00061	0.00056	0.00055				
Silicon SiO2				0.59	0.50	0.58	0.50	0.61				
Silver Ag				0.0000054	0.0000010	0.0000052	0.0000007	0.0000066				
Sodium Na				43	33	38	32	37				
Strontium Sr				0.041	0.042	0.037	0.040	0.041				
Tellurium Te				0.049	0.050	0.049	0.050	0.049				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000011		0.0000012		0.0000016				
Tin Sn				0.00044	0.00040	0.00044	0.00040	0.00045				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000030	0.000039	0.000031	0.000033				
Vanadium V				0.0006	0.0000	0.0003	0.0001	0.0003				
Zinc Zn				0.0014	0.0032	0.0032	0.0017	0.0023				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 7-A-3
Scenario 7

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 9 Mar-15	Year 9 Apr-15	Year 9 May-15	Year 9 Jun-15	Year 9 Jul-15	Year 9 Aug-15	Year 9 Sep-15	Year 9 Oct-15	Year 9 Nov-15	Year 9 Dec-15	Year 9 Jan-16	Year 9 Feb-16
Parameter												
TDS				161	121	146	145	145				
TSS				4.0	5.9	5.9	7.0	7.0				
Free CN				0.00013		0.00013						
Total CN				0.003	0.002	0.003	0.002	0.002				
WAD CN				0.0002		0.0002						
CNO				0.15		0.14						
SCN				0.002		0.002						
Sulphate				4.7	2.7	4.7	3.0	3.0				
Chloride				75	61	73	63	63				
Total Ammonia				0.032	0.008	0.039	0.013	0.013				
Nitrate				0.16	0.01	0.15	0.01	0.01				
Nitrite				0.021	0.002	0.020	0.002	0.002				
Alkalinity				28	25	28	27	27				
OrthoPhosphate-P				0.0047	0.0008	0.0045	0.0008	0.0008				
Phosphate-P				0.0200	0.0179	0.0270	0.0195	0.0195				
Org. Carbon				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3				47	43	44	44	44				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0007	0.0008	0.0031	0.0005	0.0005				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0030	0.0032	0.0031	0.0031	0.0031				
Beryllium Be				0.00002	0.00000	0.00002	0.00000	0.00000				
Bismuth Bi				0.00038	0.00003	0.00036	0.00003	0.00003				
Boron B				0.034	0.023	0.023	0.022	0.022				
Cadmium Cd				0.0000039	0.0000025	0.0000033	0.0000020	0.0000020				
Calcium Ca				14	8	13	7	7				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0003	0.0001	0.0011	0.0001	0.0001				
Copper Cu				0.0014	0.0015	0.0014	0.0015	0.0015				
Iron Fe				0.05	0.13	0.08	0.09	0.09				
Lead Pb				0.00003	0.00006	0.00005	0.00004	0.00004				
Lithium Li				0.0029	0.0028	0.0029	0.0028	0.0028				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000008	0.0000006	0.0000008	0.0000006	0.0000006				
Molybdenum Mo				0.00034	0.00015	0.00035	0.00016	0.00016				
Nickel Ni				0.0006	0.0006	0.0006	0.0004	0.0004				
Phosphorus P				0.022	0.018	0.029	0.020	0.020				
Potassium K				3.6	2.4	3.1	2.3	2.3				
Selenium Se				0.00088	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.58	0.50	0.58	0.50	0.50				
Silver Ag				0.0000054	0.0000010	0.0000052	0.0000007	0.0000007				
Sodium Na				43	33	38	32	32				
Strontium Sr				0.041	0.042	0.037	0.040	0.040				
Tellurium Te				0.049	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000012		0.0000013						
Tin Sn				0.00044	0.00040	0.00044	0.00040	0.00040				
Titanium Ti				0.0060	0.0060	0.0060	0.0060	0.0060				
Uranium U				0.000026	0.000030	0.000039	0.000031	0.000031				
Vanadium V				0.0006	0.0000	0.0003	0.0001	0.0001				
Zinc Zn				0.0014	0.0032	0.0032	0.0017	0.0017				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				

Table H 7-A-3
Scenario 7

Loadings in Little Roberts Loadings in Little Roberts Creek Outflow (kg/month)

Date	Year 10 Feb-16	Year 10 Mar-16	Year 10 Apr-16	Year 10 May-16	Year 10 Jun-16	Year 10 Jul-16	Year 10 Aug-16	Year 10 Sep-16	Year 10 Oct-16	Year 10 Nov-16	Year 10 Dec-16	Year 10 Jan-17
Parameter												
TDS				151	121	136	145	158				
TSS				4.0	5.9	5.9	7.0	6.9				
Free CN				0.00007		0.00007		0.00008				
Total CN				0.003	0.002	0.003	0.002	0.003				
WAD CN				0.0001		0.0001		0.0001				
CNO				0.08		0.07		0.09				
SCN				0.001		0.001		0.001				
Sulphate				3.8	2.7	3.8	3.0	4.2				
Chloride				68	61	66	63	72				
Total Ammonia				0.019	0.008	0.027	0.013	0.030				
Nitrate				0.08	0.01	0.08	0.01	0.10				
Nitrite				0.012	0.002	0.012	0.002	0.014				
Alkalinity				28	25	27	27	27				
OrthoPhosphate-P				0.0028	0.0008	0.0027	0.0008	0.0033				
Phosphate-P				0.0183	0.0179	0.0256	0.0195	0.0217				
Org. Carbon				5.5	5.1	7.4	5.0	5.0				
Hardness CaCO3				46	43	43	44	45				
Total Metals												
Aluminum Al				0.03	0.06	0.08	0.07	0.07				
Antimony Sb				0.0005	0.0008	0.0030	0.0005	0.0007				
Arsenic As				0.0005	0.0004	0.0004	0.0004	0.0004				
Barium Ba				0.0029	0.0032	0.0031	0.0031	0.0032				
Beryllium Be				0.00002	0.00000	0.00001	0.00000	0.00002				
Bismuth Bi				0.00021	0.00003	0.00020	0.00003	0.00025				
Boron B				0.034	0.023	0.023	0.022	0.023				
Cadmium Cd				0.0000032	0.0000025	0.0000027	0.0000020	0.0000029				
Calcium Ca				11	8	10	7	11				
Chromium Cr				0.001	0.000	0.001	0.000	0.000				
Cobalt Co				0.0002	0.0001	0.0010	0.0001	0.0002				
Copper Cu				0.0013	0.0015	0.0013	0.0015	0.0016				
Iron Fe				0.05	0.13	0.09	0.09	0.09				
Lead Pb				0.00002	0.00006	0.00004	0.00004	0.00004				
Lithium Li				0.0028	0.0028	0.0028	0.0028	0.0029				
Magnesium Mg				7.3	6.6	6.6	6.5	6.5				
Manganese Mn				0.007	0.021	0.013	0.010	0.010				
Mercury Hg				0.0000007	0.0000006	0.0000008	0.0000006	0.0000008				
Molybdenum Mo				0.00025	0.00015	0.00027	0.00016	0.00028				
Nickel Ni				0.0005	0.0006	0.0005	0.0004	0.0005				
Phosphorus P				0.019	0.018	0.026	0.020	0.023				
Potassium K				3.2	2.4	2.8	2.3	2.8				
Selenium Se				0.00089	0.00057	0.00062	0.00056	0.00056				
Silicon SiO2				0.55	0.50	0.55	0.50	0.56				
Silver Ag				0.0000033	0.0000010	0.0000033	0.0000007	0.0000041				
Sodium Na				41	33	36	32	35				
Strontium Sr				0.041	0.042	0.036	0.040	0.040				
Tellurium Te				0.050	0.050	0.050	0.050	0.050				
Thallium Tl				0.000030	0.000030	0.000030	0.000030	0.000030				
Thorium Th				0.0000007		0.0000008		0.0000011				
Tin Sn				0.00042	0.00040	0.00042	0.00040	0.00043				
Titanium Ti				0.0060	0.0060	0.0061	0.0060	0.0061				
Uranium U				0.000026	0.000030	0.000039	0.000031	0.000032				
Vanadium V				0.0006	0.0000	0.0003	0.0001	0.0002				
Zinc Zn				0.0012	0.0032	0.0030	0.0017	0.0020				
Zirconium Zr				0.0050	0.0050	0.0050	0.0050	0.0050				