Alistair MacDonald

From: Adrian Brown [abrown@abch2o.com]

Sent: August 29, 2007 9:53 PM

To: Alistair MacDonald

Cc: 'Catherine Mallet'; 'Lionel Marcinkoski'; 'Lindsay Cymbalist'; 'Michael Palmer'; 'Nathan Richea'; 'Teresa Joudrie'; 'Kathleen Racher'; 'Lorraine Seale'

Subject: Tamerlane Ventures: Ammonia Evaluation Information

To: Al~~a~~istair MacDonald, Mackenzie Valley ~~Land and Water~~ EIR Board

Al~~a~~istair:

Please find for submission the attached information relating to ammonia concentration evaluation for mines utilizing emulsion/ANFO mixes as the blasting agent. The information has been extracted from "Diavik Diamond Mine Ammonia Management Plan Review Panel Report, prepared by the Weh'eezhii Land and Water Board Ammonia Management Plan Expert Panel, dated February 9, 2007. This document is available on the WLWB website at http://www.mvlwb.com/pdf/pre2000water/N7L2-1645/Report/AmmMgmt/AMP/AMP-ExpertPanelReport-Feb07.pdf

The above study also provides a template for the evaluation of the concentration of ammonia in a mine discharge stream, using source concentraions of ammonia, and the water balance for the project. This evaluation applied to the Diavik site is available on the WLWB website at http://www.mvlwb.com/pdf/pre2000water/N7L2-1645/Report/AmmMgmt/AMP/AMP-Expert-AmmoniaModel7.zip. The file contains the computational framework for evaluation of the quality of any conservative constituent of a discharge water stream of a mining project.

Respectfully submitted

Adrian Brown

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AdrianBrown

Memorandum

Date: August 29, 2007

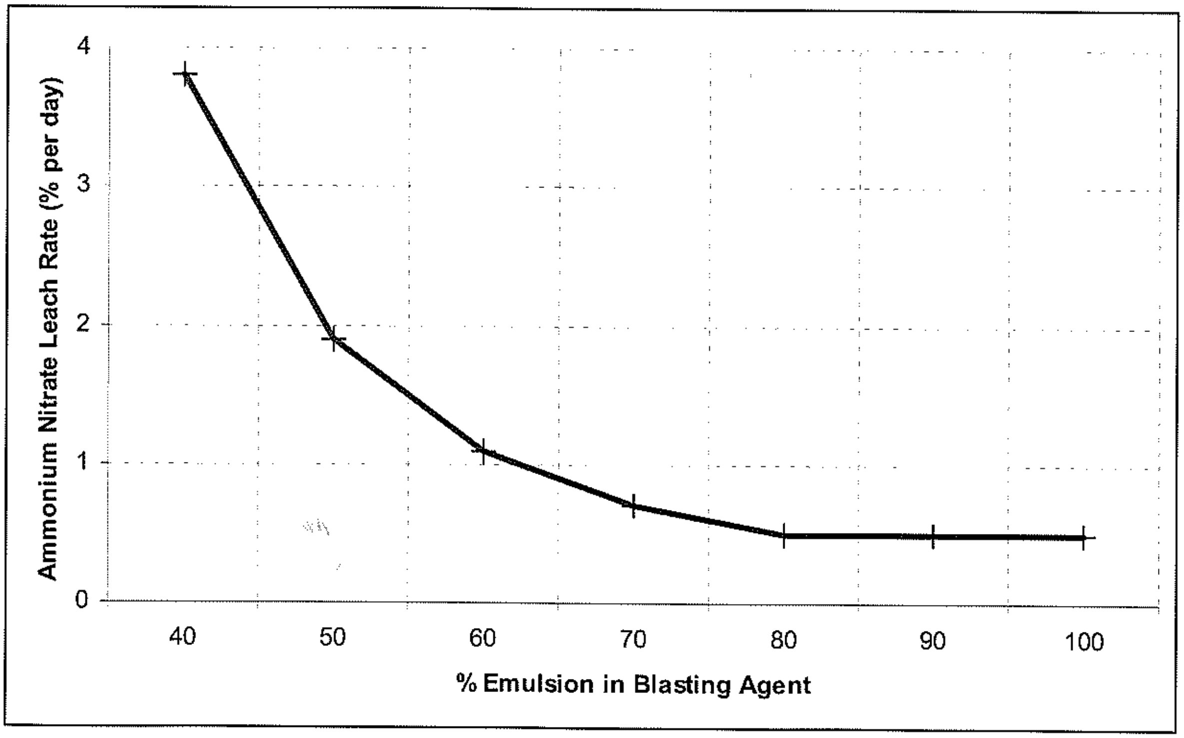
From: Adrian Brown, Adrian Brown Consultants

To: Alastair MacDonald, Mackenzie Valley Land and Water Board

Subject: **Dissolution Rate of ANFO-Based Blasting Emulsions**

The leaching rate of bulk emulsions increases with ANFO (Ammonium Nitrate/Fuel Oil) content in the blend as shown in Figure A1-1 (Orica Mining Services, undated communication), using data from laboratory experiments. The emulsion was contained in cylindrical sieves immersed in a large volume of stirred water. The conditions are not exactly comparable to emulsion attacked by water while loaded in a borehole, but should show similar behaviour. One may note from this data that moving from 65% emulsion/35% ANFO to 80% emulsion/20% ANFO approximately halves the ammonium nitrate leaching rate; moving to 100% emulsion would give little, if any, additional improvement. The composition of the emulsion tested was not exactly the same as that used at Diavik, but the latter should exhibit similar behaviour.

Figure A1-1: Leaching Rate of Doped Bulk Emulsion



Source: Matts, Brown, and Koren, 2007, Section 2.2.3

REFERENCE

Matts, T., Brown, A., and Koren, D., 2007. *Diavik Diamond Mine Ammonia Management Plan Review Panel Report*. Report prepared for the Wek'eezhii Land and Water Board by the WLWB Ammonia Management Plan Expert Panel, February 9, 2007. Copy of report available on WLWB website at http://www.mvlwb.com/pdf/pre2000water/N7L2-1645/Report/AmmMgmt/AMP/AMP-ExpertPanelReport-Feb07.pdf

Subject:	**WLWB AMMONIA SIMULATION MODEL**					AdrianBrown
Project:	Diavik Ammonia Evaluation			**Project #:**	1603A	
Author:	Adrian Brown, P.E.	**Date:**	14-Mar-07	**Page:**	1 of 3	

1. INTRODUCTION

The WLWB ammonia simulation model has been prepared to determine the lowest practical concentration of ammonia in discharge to Lac de Gras from the Diavik project.

2. METHOD

The model simulates the non-production portion of the water management system at Diavik. This system collects water containing ammonia from the mining areas, discharges the combined flow into the North Inlet, and then passes North Inlet water through the (phosphate and TSS) Water Treatment Plant to discharge in Lac de Gras.

The water management system that contributes to the discharge into Lac de Gras is shown in Figure A-1. The principal components of the system that are considered in the ammonia model are as follows:

1. A154 Surface Mine. This mine uses ammonium nitrate based blasting agents, and has inflow from groundwater that mobilizes the ammonium nitrate residue to the water management system.
2. A418 Surface Mine. This mine is currently being prepared for development by construction of a levee around the mine area and pumping lake water to the North Inlet for sediment removal and discharge. Subsequently, the
3. A154/A418 Underground Mine. This mine complex is being developed to exploit the lower portions of the A154 and A418 kimberlite pipes from underground. Ammonium nitrate based explosives will be predominantly used in this complex. Water inflow to these mines will rapidly dewater the surface mines from above, and the (large) total flow will be directed to the North Inlet.
4. A21 Surface Mine. The A21 kimberlite is currently being evaluated by underground exploration. If developed, extraction will be by surface mining, followed by underground extraction. The water from this mine will be directed either to the North Inlet system, or to the Processed Kimberlite Containment (PKC) system, from which there is normally no discharge to Lac de Gras.

The model operates by considering the mass flux of ammonia through the North Inlet on a monthly basis. It computes the ammonia discharged to the North Inlet by these components, computes the amount of ammonia lost during residence in Lac de Gras, and computes the amount of ammonia lost by discharge through the WTP to Lac de Gras. It then computes the concentration of ammonia in the North Inlet at the end of the month by dividing the remaining ammonia into the remaining water volume in the North Inlet.

3. CALIBRATION

The model is calibrated against the performance of the water management system for the period 2003 through 2006. The calibration is used to develop three parameters that fit the ammonia concentration at discharge to the ammonia used in mining:

1. Ammonia Loss Rate. This annual parameter is computed from the relationship between the actual ammonium nitrate used in blasting to the ammonia that is discharged from the mining system. The loss rate has been computed for the last four years, and is presented in Table A-1. The loss rate has increased over the life of the A154 Surface Mine, and is currently standing at an annual average loss rate of 2.3% of ammonium nitrate used in blasting. This value has not been significantly reduced by recent variation in emulsion/ANFO mixture from 65/35 to 80/20, suggesting that the loss rate is not strongly dependent on blasting agent solubility. The increase in loss rate has been related to the water inflow to the mine, as shown in Table A-1.
2. Ammonia Rate Factor. This parameter is developed to produce the observed significant variability in ammonia loss from month to month. The causes for the variability from month to month are not well known, but they do occur. The monthly Ammonia Rate Factor that best reproduces the variability of the discharged ammonia concentration is presented in Table A-2, using data collected from the A154 Surface Mine. Note that the rate factor has been selected to produce the magnitude of the variations observed in ammonia discharge, not necessarily the month of the year in which they have occurred historically.

3. North Inlet Ammonia Destruction. This parameter is computed from the observed behavior of the system to date to reflect the monthly amount of ammonia that is destroyed (likely converted to nitrate and nitrogen) in the North Inlet. The ammonia destruction is presented in Table A-3, and represents the average of the ammonia destruction computed by subtracting the ammonia input to the lake from the change in ammonia inventory in the lake on a monthly basis. A one month time lag is observed between ammonia input at the west end of the inlet, and ammonia concentration change at the lake discharge at the east end of the inlet, and this is accommodated by lagging the comparision by one month. The ammonia destruction is strongly temporal, approaching zero in the winter when the North Inlet is ice covered, and over 2 tons per month in summer, when the lake is (presumably) warmer and more agitated and oxygenated.

4. SIMULATION

Forward simulation is performed by applying a mining schedule, ammonium nitrate use schedule, dewatering flow schedule, ammonium nitrate loss schedule, and any ammonia removal schedules resulting from mitigation measures to the calibrated model. The model then simulates the expected future ammonium concentrations in the North Inlet discharge, and the upper confidence limit for those concentrations.

The model is used to simulate a range of outcomes, as follows:

1. Base Case. This case involves performance of the project as proposed by DDMI, with mining, ammonium nitrate use, dewatering, and water management unchanged. Ammonium nitrate dissolution performance is maintained at the current level, and no ammonia mitigation measures are included. This constitutes the "no action" case, against which the benefits of taking ammonia mitigation actions are evaluated.

2. Mitigation Cases. These cases evaluate the ammonia concentration at discharge upon adoption of a suite of practical ammonia mitigation measures, including improved blasting measures, modified water management practices, and treatment options. The results are evaluate the improvement in ammonia discharge performance.

5. EVALUATION OF EFFLUENT QUALITY CRITERIA

Effluent Quality Criteria are set for the project by determining the effluent quality that can more probably than not be achieved on every monitoring period in the project life.

The EQC for 30-day sampling is set by the following process:

1. The expected monthly average ammonia discharge concentrations are determined by simulation.
2. The relationship between the upper confidence limit of the peak monthly concentration and the average monthly concentration is determined using the four years of actual data. The 99.9923% upper confidence limit is used, representing the confidence required to meet the required more probable than not condition for any day in the project.
3. The peak concentration estimate for each month of the operation is determined by applying the peak relationship to each simulated month.
4. The maximum discharge concentration for any month in the project is selected as the EQC.

The EQC for 1-day grab sampling is set by the following process:

1. The relationship between the upper confidence limit of the peak daily concentration and the monthly concentration is determined using the four years of actual data. The 99.9923% upper confidence limit is also used.
2. The upper concentration limit for grab samples taken in any month is determined by applying the relationship between UCL peak daily concentration and monthly concentration to each simulated UCL estimate of monthly concentration, computed as described above.

3. The maximum discharge concentration for any day in the project is selected as the EQC for grab samples.

Diavik Diamond Mine
Ammonia Management Plan
Review Panel Report

Prepared by:

Wek'èezhìi Land and Water Board
Ammonia Management Plan
Expert Panel:

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Date: February 9, 2007

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ListofTables

ListofFigures

ListofAttachments

Mining commenced in the A154 Pit of Diavik Diamond Mines, Inc. (DDMI) in late 2002 under the terms of Water License N7L2-1645. Within 6 months, ammonia concentrations in the mine water and the final effluent were following a trend that indicated that the existing effluent quality criteria (EQC) for discharge of water from the project into Lac de Gras of 2 mg/L total ammonia 30 day average/4 mg/L 1 day peak would in time be exceeded. This observation resulted in a series of actions that led to the adoption of a temporary EQC of 20 mg/L total ammonia pending the identification of ammonia control methods that would meet the original EQC, or such other EQC that would represent the "lowest effluent criteria practical at the site".

DDMI submitted an Ammonia Discussion Paper on May 15, 2006, which considers ammonia management and control at the site, and a draft Ammonia Management Plan on October 4, 2006. This plan presents DDMI's proposed lowest practical EQC for ammonia, and a plan for implementation of the ammonia mitigation measures required to achieve them.

The Wek'èezhìi Land and Water Board (WLWB) is responsible for the regulation and oversight of the Diavik operation with respect to environmental compliance. To review the ammonia EQC and the Ammonia Management Plan, WLWB created the WLWB Ammonia Review Panel, comprising Terry Matts, Ph.D., (ExRT, Inc., Blasting), Adrian Brown, P.E. (Adrian Brown Consultants, Inc., Water Management), and David Koren, Ph.D. (CANMET-MMSL, Ammonia Treatment).

The Panel considered blasting, water management, and treatment approaches to ammonia control, followed by integration of the practical ammonia control options to determine the lowest practical ammonia discharge concentration for the site, which resulted in the following EQC for ammonia:

For calendar year 2007:

- Monthly Maximum Discharge EQC..........................5.1 mg/L ammonia as nitrogen
- Daily Maximum Discharge EQC..............................8.5 mg/L ammonia as nitrogen

For calendar year 2008 through the end of the project:

- Monthly Maximum Discharge EQC..........................3.3 mg/L ammonia as nitrogen
- Daily Maximum Discharge EQC..............................6.8 mg/L ammonia as nitrogen

These EQC are set so that after implementation of an Ammonia Management Plan there is less than a 5% probability that the project would fail these standards on the maximum ammonia concentration day or month in its operation.

The DDMI Draft Ammonia Management Plan proposes ammonia management actions including the following:

- Improved Explosive Management and Use
- A418 Pit Water as Make-up to Process Plant.
- Enhanced Retention Time and Natural Treatment within the North Inlet

The Panel reviewed the Plan and determined that if the Plan were fully, successfully and rapidly implemented, the Plan will achieve the WLWB Lowest Practical EQC. This report provides recommendations to the WLWB relating to requirements for DDMI to finalize and implement the Plan.

1. INTRODUCTION

Mining commenced in the A154 Pit of Diavik Diamond Mines, Inc. (DDMI) in late 2002. Within 6 months, ammonia concentrations in the mine water and the final effluent were following a trend that indicated that the existing effluent quality criteria (EQC) for discharge of water from the project into Lac de Gras of 2 mg/L total ammonia 30 day average/4 mg/L 1 day peak would in time be exceeded.

This observation resulted in a series of actions that lead to the adoption of a temporary EQC of 20 mg/L total ammonia pending the identification of ammonia control methods that would meet the original EQC, or such other EQC that would represent the "lowest effluent criteria practical at the site" (MVLWB, 2004a).

DDMI submitted an Ammonia Discussion Paper (DDMI, 2006a; 2006b) on May 15, 2006. This document is required under the terms of Water License N7L2-1645 (MVLWB, 2004b, Part H, Item 21) and the Record of Agreement (MVLWB, 2004a). The paper considers the toxicity of ammonia, and then considers ammonia management in three sections, covering explosives management and use, mine water management, and water treatment technologies. It then considers the combined effect of application of ammonia controls on the effluent discharge from the project.

Based on the Ammonia Discussion Paper, DDMI also submitted a draft Ammonia Management Plan on October 4, 2006 (DDMI, 2006c). This plan presents DDMI's proposed lowest practical EQC for ammonia, and a plan for implementation of the ammonia mitigation measures required to achieve them.

The Wek'èezhii Land and Water Board (WLWB) is responsible for the regulation and oversight of the DDMI operation with respect to environmental compliance. To review and evaluate the Ammonia Discussion Paper, the ammonia EQC, and the Ammonia Management Plan, WLWB created the WLWB Ammonia Review Panel, comprising Terry Matts, Ph.D., (ExRT, Inc., Blasting), Adrian Brown, P.E. (Adrian Brown Consultants, Inc., Water Management), and David Koren, Ph.D. (CANMET-MMSL, Ammonia Treatment).

This report documents the results of the WLWB Panel review. The review considered blasting, water management, and treatment approaches to ammonia control, followed by integration of the ammonia control options to determine the lowest practical ammonia discharge concentration for the site. Using the results of this evaluation, the Panel then identified the lowest practical EQC for ammonia. Finally, the Panel reviewed the draft Ammonia Management Plan, determined whether the Plan would achieve the lowest practical EQC, and developed recommendations for finalization and implementation of that plan.

2. EXPLOSIVES MANAGEMENT AND USE

2.1 Introduction

The WLWB Ammonia Review Panel ("the Panel") conducted an evaluation to determine practical ammonia release mitigation methods to reduce the Ammonium Nitrate Dissolution Rate (ANDR) for blasting practices at the Diavik Mine. This evaluation was performed by panel member Dr. Terry Matts.

The Panel agrees with DDMI and other stakeholders that the most effective solution for minimizing the amount of ammonia and nitrate in discharged minewater is to prevent it entering in the first place. Accordingly, the Panel has reviewed the theories contained in the draft AMP (Diavik, 2006c) and the Golder Associates Ltd. "AN Loss Mechanism Investigation" (Golder, 2006b) as to the mechanisms of ammonium nitrate (AN) loss.

The draft AMP concludes that "…dissolution prior to blasting is unlikely to be a dominant nitrogen loss pathway and the focus was shifted to loss mechanisms post-blast with the dominant causal factor being incomplete detonations". The Golder investigation supports this and other causes; the Panel is not so sure. If incomplete detonation was a significant factor then some misholes would occur. None was found. Misholes consist of explosive charges that do not initiate. They completely fail to explode and a mass of emulsion would remain in the borehole or within the blast and be found when the muckpile is dug. Also, there would be many more occasions of poor blast results and massive NO_x emissions from blasts. From the videos reviewed, all blasts appeared to function reasonably well, with forward movement, no flat areas, and acceptable fragmentation. Though some NO_x was emitted the amount was not huge and it could just as well have resulted from leached AN around the boreholes or deflagrating emulsion in cracks.

Some discussion of the Velocity of Detonation (VoD) tests conducted by Golder (Golder, 2006b) is in order. Deflagration[1] should be evidenced by much lower VoD rates than normal and noisy traces because of inefficient crushing of the probe cable by the propagating explosive. Though examples of low VoD were measured, only five holes showed evidence of deflagration in the 20 blasts monitored. Additionally, one hole (blast 290-040, hole J03) fired at 3144m/s for 1.08m, then dropped off into deflagration. Note that a VoD of 3740m/s (the lowest measured, except for J03 and two <1000m/s) is still detonation; true deflagration would be indicated by an irregular VoD below 2000ms. Only two traces in the whole study show such a pattern (in the other three holes thought to have deflagrated the traces were too noisy for the VoD to be determined). An explosive detonating with a clean VoD trace, even if the speed is slower than normal, is probably totally consumed with minimal by-products. Emulsions loaded into wet holes have been reported previously to have variable VoD (Lee, 2001). More traces with VoD greater than 4835m/s displayed significant dropouts (8) than those with VoD less than 4835m/s (6), so the low VoD traces were no noisier on average than others. The success rate for VoD measurements of 51% overall is not very good; 74% is more typical (NIRM, 2001). The success rate improved in the final phase of the study (with 80/20 and 100/0 emulsion) to 65%, probably because of refinement of technique. The shortfall from 74% was likely due to the severe water conditions in the

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[1] See Secton 2.4.1 below for an explanation of this term.

A154 pit. A hole with no, or an uninterpretable, VoD record does not necessarily indicate a misfire. In the violence of a blast, there is severe ground movement. In the Panel's experience, ground heaving behind a detonating hole is more often responsible for snapped probe cable than flyrock.

The Golder report concluded that the spikes in AN concentration occurring after some of the blasts were due to the by-products of incompletely detonating emulsion explosive. The Panel does not necessarily agree with this and believes that there are other reasons for AN loss. The five largest spikes in AN concentration from July through October, 2006, occurred after blasts 260-002, 290-045, 260-004, 260-005, and 250-001. Only two, 290-045 and 260-004, were probed for VoD. Only three holes gave valid readings out of 12 attempted. All had below average VoD (4590, 4616, & 4005m/s), but the traces were clean and the missing recordings seemed to be due to abrupt probe cut-offs rather than deflagrating holes. Thus Golder's conclusion is based on flimsy evidence.

Another clue is in the water analysis results. Even with deflagration, the ammonium part of AN is oxidized to NO_x, which, if dissolved, would report to the nitrate part of the analysis, leaving very little ammonia nitrogen. The analyses do not support this. Consider blast 260-002, loaded over 10 days and shot on July 27, 2006. On 22 July there was spike in AN concentrations when, presumably, loading took place in an area of the blast where there was flowing water. The high nitrogen readings found in samples 275-001-74 and 275-001-75 showed a nitrate:ammonia ratio of 1.08. The theoretical number is 1.00 indicating that pure, unaltered AN was being leached from the blast. Note that the "background" ratio is very variable but is almost always well over 1.0. After the blast the ratio downstream increased to 1.17 on August 28 (samples 275-001-109 & -113) and 1.28 on August 29 (sample 275-001-121), showing that the water still contained lots of ammonium ion

The Golder report also notes that some emulsion is leached by flowing water. There is direct evidence for this in the water analysis results during the loading of blasts (e.g. 260-002) and the observation of stemming slumping in some boreholes overnight. However, most AN seems to be released right after blasting. Static or slowly flowing water cannot be eliminated as a cause. Typical porosity to free water of granite rock is 1%. At a leach rate of 1% per day (see Section 2.2.3 below) a 100 hole blast in waste would release as much as 1 tonne of AN after three days "sleeping" (see evaluation in Section 2.4.2 below).

There is also likely to be some loss of emulsion to fissure. The Golder report states that the rock around Dewey's fault "...consists of broken to very broken ground", but also states that the joints are tight. DDMI contends that the broken ground in the Dewey's fault/kimberlite areas is located only at the tops of the holes where the rock has been pre-conditioned by the blast above. Explosive columns reach no closer than 5 m (waste) or 3.5 m (kimberlite) to the surface. However, it is impossible to eliminate this source, as its manifestation would be exactly the same as AN from a dissolution plume or AN by-products from a poorly detonating borehole. Emulsion in cracks would be crystallized by the blast shock wave and grinding with rock particles in the muckpile. Crystallized emulsion has little water resistance so would dissolve very quickly.

Two possible AN loss mechanisms were not addressed by either the draft AMP or Golder's report: contamination of the tops of the emulsion columns by stemming, and pre-compression.

Several of the VoD traces depict a satisfactory velocity but over a much shorter length than design. This may be because the booster was located at a higher horizon than planned, but it could also indicate that the stemming material penetrated a distance into the top of the explosive column, causing the emulsion in that area to deflagrate or fail. Several holes showed such a pattern (e.g. hole G21 in blast 270-017). This phenomenon is more prevalent in dry holes, as would be expected. Interestingly, some records exhibit a longer trace than design. This probably indicates that the booster was not pulled up off the bottom of the hole by the blaster while loading.

Pre-compression is a condition that can affect certain explosives while a blast is in progress, causing them to behave abnormally or fail completely. The emulsion at Diavik relies for detonation sensitivity on small gas bubbles introduced by a chemical reaction as the explosive is loaded into the borehole. These bubbles can be easily compressed by a shock wave from a neighbouring borehole firing on an earlier delay or by gas or water pressure transmitted through cracks. Shock waves are transient and the bubbles have the opportunity to rebound before it is time for the hole to fire, but gas and water pressure pulses can be much longer lasting (Orica, undated). DDMI do not believe that pre-compression is a factor in their operation (DDMI, 2007). Golder is fast to blame slower-than-average VoD on "poor detonation", but they have no explanation for faster-than-average VoD. Pre-compression is known to be capable of either lowering or raising VoD, depending on circumstances (Madsen, 2007).

The Panel therefore concludes that it would be unwise to concentrate on mitigation measures that address only one possible source of AN loss – all possible mechanisms for AN loss should be included.

However, the Panel does agree that one source of AN loss, encountered in other operations, namely spillage, is being efficiently managed, providing that personnel are properly trained and supervised to ensure that the applicable SoPs are followed.

Despite extensive literature searches and the petitioning of industry contacts, little hard information was obtainable to enable quantification of the anticipated reductions in ANDR from adopting the various measures suggested by Diavik in the Ammonia Discussion Paper (Diavik, 2006a), or measures identified by the Ammonia Review Panel. Therefore the ANDR percentages presented are, for the most part, estimates based on experience at Diavik and the Panel's experience elsewhere.

The best estimate for a base ANDR for late 2007 and early 2008 is 2.79%. This estimate is developed by linear interpolation from the actual flow and ammonium nitrate dissolution rate provided by DDMI (2006a), and is presented in Table 2-1.

Table 2-1 - Ammonium Nitrate Dissolution Rate - A154 Surface Mine

Year	Flow rate	AN Use	AN Dissolution Rate	
	m3/d	t/y	%	t/y
2003	7,700	10,400	0.92%	96
2004	10,500	9,700	1.60%	155
2005	14,100	8,700	1.98%	172
2006	15,700	7,700	2.26%	174
2007	17,200	4,900	2.79%	137

This value presumes that no effective mitigation measures were introduced between September, 2006 and the present. The value is a yearly average to which a monthly correction factor can be applied depending on water flow rate and anticipated explosive use.

The mitigation methods suggested in the Ammonia Discussion Paper (Diavik, 2006a) and by Golder Associates (methods EM-1 through EM-8) (Golder, 2006b), plus some additional measures identified by the Panel, will be discussed, and their relative practicality and effectiveness evaluated.

2.2 AN Dissolution Rate Reduction Options

2.2.1 EM-1: Increased Priming

Increased priming of blastholes increases the probability of full detonation, and therefore reduces the likelihood of undetonated explosive or deflagration products remaining after a blast.

There are two alternative approaches to increasing priming, which can be used alone or in combination:

- Use of multiple boosters (usually two, at separate locations in the explosives column)
- Use of boosters of larger size

Use of "double-priming" always gives a higher probability for full detonation of an explosive charge for many reasons (beyond the scope of this discussion), in addition to the effects of water leaching. For holes that are partially leached prior to detonation, there is more chance that the top booster will be located in better quality explosive, as water pressure and flow are likely to be higher near the toe of a borehole. Using cast boosters of larger size (e.g. 2 lb. or 5 lb.) has only proved advantageous in products of marginal sensitivity, which is not the case here (Orica, undated; NIRM, 2001). To try to initiate leached holes reliably that would fail with a 1 lb. booster would necessitate a "combination primer" (a booster inside a large bag of packaged explosive). This would be successful in only a very small number of leached holes and would have all the disadvantages of a packaged product (see 2.2.10 below). Also, DDMI (2007) and Golder (2006b) report that misholes (i.e. holes in which there is no detonation) do not occur at the operation, so presumably all holes at least partially detonate or deflagrate. Double-priming is not required in kimberlite holes because of the short column lengths (1.5m) and residence times (≤ 1 day).

The conclusion for ANDR relating to increased priming is as follows:

1. Double-priming: 5% reduction in ANDR is practical and achievable
2. Increasing booster size: no effect on ANDR.

2.2.2 EM-2: Improved Loading Practices

Correct loading techniques (particularly hose-handling) are fundamental to the successful use of bulk emulsions, and to the reduction of AN losses. Improper technique can lead to one or more of the following problems:

- Hose not lifted from the bottom of the hole. This can stir up drill cuttings and mud which contaminate the emulsion in the region of the (bottom) booster. This can seriously degrade detonation of emulsion in bad ground or where holes have been backfilled with drill cuttings (NIRM, 2001).
- Hose lifted too far from the bottom of the hole before pumping starts. This practice can entrain pockets of water in the emulsion in the area of the (bottom) booster. The Panel concurs with the Golder recommendation of limiting hose lifting to 0.5 meter from the bottom of the hole to prevent occlusion from this source.
- Hose pulled up too fast during loading. If the hose is raised too quickly, in particular if it is raised above the top of the introduced emulsion in the hole, pockets of water may trapped in the explosive column, creating gaps in the explosive column that may arrest detonation or start deflagration.
- Booster not pulled up off the bottom of the hole. The booster's initiating power is reduced if it is not surrounded by unadulterated explosive. This practice can lead to low-order detonation, or complete failure of the explosive column to shoot.
- Booster floating up on top of the explosive column. This problem can also cause degraded detonation of the explosive column. This is particularly important for the top booster if the hole is double-primed.
- Stemming the hole too quickly. This practice may inhibit complete gassing (i.e. sufficient sensitization) of the emulsion. Also, because the emulsion will still be hot and fluid, there will be more penetration of stemming material into the top of the emulsion column, resulting in incomplete detonation of this portion of the explosive (see Section 2.2.13 below).

Loading bulk explosives in a northern open-pit mine is a cold, dirty, and repetitious task. It is important that members of the Diavik blast crew are properly trained and supervised, and aware of the importance that correct loading practices have on the success of the blasting operation in general, and reduction of AN pollution in particular.

The conclusion for ANDR relating to loading techniques is:

- Improved Loading Practices: 5% reduction in ANDR is practical and achievable by adherence to standard operating procedures for loading, which can be assured by maintaining effective training and supervision of blasting personnel.

2.2.3 EM-3: Emulsion with Reduced ANFO Content

The leaching rate of bulk emulsions increases with ANFO (Ammonium Nitrate/Fuel Oil) content in the blend as shown in Figure 2-1 (Orica, undated), using data from laboratory experiments. The emulsion was contained in cylindrical sieves immersed in a large volume of stirred water. The conditions are not exactly comparable to emulsion attacked by water while loaded in a borehole, but should show similar behaviour. One may note from this data that moving from 65% emulsion/35% ANFO to 80% emulsion/20% ANFO approximately halves the ammonium nitrate leaching rate; moving to 100% emulsion would give little, if any, additional improvement. The composition of the emulsion tested was not exactly the same as that used at Diavik, but the latter should exhibit similar behaviour.

Figure 2-1: Leaching Rate of Doped Bulk Emulsion

These results are encouraging with respect to control of AN dissolution rate until reference is made to the actual performance at Diavik. The explosive blend used in the A154 surface mine was changed from 65% emulsion/35% ANFO to 80% emulsion/20% ANFO on September 20, 2006. The results of this change on ammonium nitrate dissolution are shown in Table 2-2 for the following three months, and are compared with the same three months in 2005 (to eliminate temporal effects).

Table 2-2: Ammonium Nitrate Loss after Emulsion Explosive Change

Month	2005 (65% Emulsion-35% ANFO)	2006 (80% Emulsion-20% ANFO)
October	1.0%	1.9%
November	1.3%	1.2%
December	2.3%	2.2%

In summary, the blend change in September 2006 did not appear to lower the loss rate appreciably. However, the exact conditions of blasting in the fall of 2005 and 2006 are unknown, so the figures may not be directly comparable, particularly over the short timescale. Because of this uncertainty, and the likelihood that leaching is not the only mechanism for AN loss, the full 50% improvement in ANDR indicated by these lab tests will not be achieved. Note that moving to a 100% emulsion is unlikely to give any improvement in ANDR, may need blast adjustments, and would create operational problems due to the reduced carrying capacity of the explosive delivery trucks.

The conclusion for ANDR relating to reducing ANFO content in the emulsion explosive is:

- Change to 80/20: 15% reduction in ANDR is practical and achievable
- Change to 100%: little improvement expected over 80/20, not practical

2.2.4 EM-4: Thicker Emulsion

The use of an emulsion of higher viscosity would be beneficial in two ways:

- Less loss of emulsion from flowing into cracks; and
- Slightly slower AN leaching rate

The anticipated disadvantage of higher pumping pressures is unlikely to be a problem in practice. An 80/20 emulsion/ANFO blend is easier to pump than a 65/35 emulsion/ANFO blend, and the technique of "water lubrication" can be used if pumping pressures from adopting higher viscosity emulsions are excessive.

The conclusion for ANDR relating to utilizing a thicker emulsion explosive is:

- 10% reduction in ANDR is practical and achievable

2.2.5 EM-5: New Product with less Leaching Potential

A new blasting product with even less leaching potential could be adopted to reduce AN dissolution losses still further over EM-4. One such product that has been suggested is Dyno Nobel Titan XL-1000 (Diavik, 2006b). The use of such an advanced emulsion explosive would presumably lead to lower ANDR than simply thickening the existing product.

However, this change would likely require changes to the explosives plant, and possibly trucks. Implementation might take some time (e.g. equipment brought in on the 2007-08 winter road) and would involve both capital costs and increased operating costs. These additional costs are unlikely to be justifiable for a product required only for a short time in the remaining surface mining operations.

The conclusion for ANDR relating to utilizing a new emulsion product is:

- Not practical

See Section 2.4.3 below for a discussion of other possible types of explosive that could be used.

2.2.6 EM-6: Reduce Explosives Residence Time

It can be seen from the Golder's blasting study that, apart from shots in kimberlite, blasts are loaded over an average period of 3 days. In the fall of 2006 there did appear to be an improvement to 2 days. Two blasts in the summer of 2006 took 6 & 10 days to load and the blasts were followed by large spikes in mine-water AN content. Review of the data indicates that the dissolved AN was released from the vicinity of the borehole upon detonation of the blast. This may be a result of the greatly increased permeability in the blasted rockmass releasing water from the vicinity of the borehole that has dissolved ammonium nitrate over the period between loading and detonation. It may also be the result of post-blast dissolution of AN from un-detonated emulsion that has been crystallized by the blast impact, in which case there would be little correlation between residence time of the emulsion explosive in the blasthole and concentration of ammonia in the resulting mine water. Possibly incomplete detonation of a heavily leached emulsion could contribute.

Whatever, less contact time with water must mean less ammonium nitrate loss. The production blasts at Diavik are reasonably small so there should be no reason, with good mine management, to leave explosives in the ground before blasting for more than two days.

The conclusion for ANDR relating to reduction of explosives residence time is:

- 15% reduction in average ANDR practical and achievable
- 30% reduction in spike ANDR practical and achievable

2.2.7 EM-7: Dewater Blastholes

This AN mitigation strategy can be dismissed very quickly. For blastholes in high permeability rock in which the water table is above the base of the blasthole (essentially all holes in the kimberlite, and all holes along the track of Dewey's Fault) the water will flow back very quickly after the holes are loaded. Leaching of emulsion, and in some cases ejection due to artesian flow, will begin immediately. There will be little change in loss to fissures intersecting the hole.

Accordingly, dewatering the holes, even if possible at the bottom of the pit, is not expected to have a significant effect on ammonium nitrate dissolution. It would be a difficult operation in the winter due to freezing problems (equipment and bench top).

The conclusion for ANDR relating to blasthole dewatering is:

- Impractical in the worst areas and in winter, and no effect

2.2.8 EM-8: Dewater Blastholes and Install PE Liner

This is the proverbial "Catch 22". If a borehole can be dewatered easily (in ≤ 5 minutes) then the water flow is likely low enough that the emulsion will be leached very slowly anyway. Also, such holes are unlikely to exhibit significant fissures, otherwise water would be coursing through them. The holes that would really benefit from a liner are precisely the ones that cannot be effectively dewatered.

The conclusion for ANDR relating to dewatering and placing a blasthole liner is:

- Impractical in the worst areas and in winter, would be effective (see EM-9).

2.2.9 EM-9: Install PE Liner without Dewatering Blastholes

A polyethylene (PE) liner can be installed in the hole to contain the emulsion explosive and prevent both dissolution and dispersion into voids and fissures. This AN loss mitigation method would be most beneficial in blastholes that are substantially flooded or from which water is flowing. However, installation of a liner in these blastholes would be a difficult process, particularly in the cold. Fortunately, ammonia concentration spikes in mine water tend not to occur in the depths of winter.

Though this technique is reputed to have been used in several circumstances, there is nothing in the literature describing how it can be done or how effective it is. Two verbal confirmations were received, but no practical details (Revey, 1998; Walker, 2007). However, it would solve several problems in the "hot loading" areas of the pit where rock is of the worst quality and water flows are the highest. It would need to be used only in these areas, say on the bottom bench and the next level up. Not only would the emulsion be protected from leaching but there would be no loss to fissures either. Also, when shot, the emulsion would still be in prime condition so there would be no likelihood of deflagration. There would need to be complete commitment from the blast crew and a period of experimentation and training for this technique to succeed. Average ANDR reduction would depend on the fraction of holes to which this method is applied. Assuming use in 20% of boreholes, the conclusion for ANDR relating to placing a blasthole liner without dewatering is:

- 20% reduction in average ANDR – may be practical, achievable
- 50% reduction in spike ANDR – may be practical, achievable

2.2.10 EM-10: Use Packaged Product

An alternative to EM-9 is the use of pre-packaged ("bagged") product for the blasting agent. This approach to resolution of AN dissolution problems is not practical at the Diavik site for many reasons:

1. Off-site Supply. If the product were supplied to the site pre-packaged, large volumes of packaged explosive would need to be brought in over the ice road and stored in heated magazines. This is judged to be logistically impractical.
2. On-Site Preparation. If the product were to be packaged onsite, the explosives plant would need major modifications. (Note that the Explosives Regulatory Division, which issues factory licences for explosives, does not allow bagging of bulk emulsion off a bulk truck.) While practical, this strategy would add significant capital and operating cost to the blasting process.
3. On-Site Loading. The loading of pre-packaged cartridges would be required at a minimum in the areas where the boreholes tend to be filled with water, and where they tend to collapse due to fractured ground. Loading of these holes with pre-packaged cartridges is judged to be impractical on a production basis.

The conclusion for ANDR relating to using pre-packaged product is:

- Not practical

2.2.11 EM-11: Gas Bulk Emulsion to Lower Density

Reduction of bulk emulsion density would be useful to reduce the effects of pre-compression, if this phenomenon exists at Diavik, on the malfunctioning of explosives charges in the fractured and disturbed areas of the pipes and fault. It would be easy to implement. The explosive loads associated with lower density would be slightly less, but this theoretical shortfall in explosive energy would be compensated for by reliable functioning of the emulsion. A "cup sample density" of 1.05 g/cc is suggested. However, there is no proof that any improvement in ANDR would result

The conclusion for ANDR relating to using lower emulsion density is:

- No proven reduction in ANDR – practical, but unlikely to be effective

2.2.12 EM-12: Use of Microballoons for Sensitization instead of Gassing

Use of microballoon sensitization would be a solution in the event that pre-compression were a significant detonation failure mode at Diavik. However, it is not practicable for the location. Large volumes of microballoons would need to be brought in over the winter road. Also, major changes and capital investment would be required at the explosives plant.

The conclusion for ANDR relating to microballoon sensitization density is:

- Not practical

2.2.13 EM-13: Reduction in Stemming Penetration of Emulsion Column

There is some evidence from VoD traces that, particularly in dry holes, stemming material can contaminate a metre or so of the emulsion column at the top of the hole. Contamination by drill cuttings is known to reduce VoD and, if significant, cause deflagration (NIRM, 2001). The DDMI SoP prescribing procedures for stemming boreholes should be altered to include:

a) Leave the boreholes as long as operations permit before stemming to allow the top surface of the emulsion to cool and firm up as much as possible

b) In dry holes, and those containing less than 2m of water, carefully add 0.5m of drill cuttings before stemming with crushed rock

The conclusion for ANDR relating to changes in stemming procedures is:

- 5% reduction in ANDR - practical and achievable

2.3 Net Reduction Anticipated in AN Dissolution Rate

2.3.1 Summary of AN Reduction Options

A total of thirteen AN reduction options have been evaluated, with the results summarized in Table 2-3.

2.3.2 Combination Blasting Reduction Options

Cumulative percentages are not achievable for each of the blasting improvement steps, as they are variably dependent. However, considering the practical options that have an effect, achievable options (EM 1, 2, 3, 4, 6, & 13) indicate that a total reduction in ANDR of about 45% is likely, i.e. to an average of 1.56% from the current 2.79% average AN loss rate.

Adding EM-9 would reduce this still further to about 1.2%. EM-6 and EM-9 would have the most effect on the height of "spikes". Together they should reduce them by more than 60%.

Table 2-3: Summary of AN Loss Reduction Options from Blasting Practices

Option	Description	Practicality	AN Loss Reduction		Recommend?
			Average	Peak	
EM-1	Double Priming	Practical	5%	10%	Yes
EM-2	Improved Loading	Practical	5%	5%	Yes
EM-3	80% Emulsion/20% ANFO Ratio 100% Emulsion/0% ANFO Ratio	Practical Impractical	80/20: 15% 100/0: 20%	80/20: 20% 100/0: 20%	Yes No
EM-4	Thicker Emulsion	Practical	10%	10%	Yes
EM-5	New Low-Leaching Blasting Product	Impractical	10+%	10+%	No
EM-6	Reduce Explosives Residence Time	Practical	15%	30%	Yes
EM-7	Dewater Wet Blastholes	Impractical	No effect	No effect	No
EM-8	Dewater and Line Blastholes	Impractical	See EM-9	See EM-9	No
EM-9	PE Liner in Wet Holes	Questionable	20%	50%	Yes*
EM-10	Packaged Blasting Product	Impractical	See EM-9	See EM-9	No
EM-11	Low Density Emulsion	Practical	0%?	0%?	No**
EM-12	Microballoon Sensitization	Impractical	See EM-11	See EM-11	No
EM-13	Improve Stemming	Practical	5%	5%	Yes
Combo#1: EM-1,-2,-3,-4,-6,-13		Practical	45%	60%	Yes
Combo#2:EM-1,-2,-3,-4,-6,-9,-13		Practical	55%	70%	Yes

* Install PE liners in wet holes in high permeability areas of mine floor
** Recommended if brown fumes are emitted from blastholes after implementing EM-9 and other options

2.4

2.4 Additional Notes on Explosives Matters

2.4.1 Detonation and Deflagration

In order to create fractures an explosive must generate an intense shock wave in the surrounding rock. It does this by propagating at a speed that exceeds the velocity of sound in the material. In layman's terms, the explosive "breaks the sound barrier" creating a sonic boom like a supersonic airplane. This phenomenon is called "detonation" and is normally a stable velocity characteristic of the particular explosive and its environment (e.g. the hardness of the rock, diameter of the borehole). The major products of a detonating emulsion explosive are nitrogen, carbon dioxide, and water.

Deflagration is akin to very fast burning. Though the velocity is still high it is insufficient to create a shock wave. Thus the explosive is unable to fragment rock unless the high pressure gas produced is able to expand into pre-existing cracks. In "high" explosives (i.e. those designed to detonate), deflagration indicates some kind of malfunction. The velocity tends to be variable and propagation may die out completely. Products of a deflagrating emulsion are the same as for detonation except that large volumes of oxides of nitrogen are also produced, as well as carbon monoxide and other by-products.

The boundary between detonation and deflagration is ill-defined and depends on circumstances. However, in rock confinement, it lies roughly in the propagation velocity range of 1000 – 2000 metres per second.

2.4.2 Calculation of AN Leached by Static Water

The leaching of AN by static water prior to a blast has been computed as follows:

Waste pattern size: ....7 m equilateral (7.0m spacing, 6.1m burden)
Bench height: ....10 m
Volume of rock surrounding each borehole: ....$7 \times 6.1 \times 10 = 427\ m^3$
Average free porosity of granite: 1%
Volume of water surrounding each borehole:............$1\% \times 427\ m^3 \times 1000\ L/m^3 = 4{,}270$ litres

The amount of AN in a hole charged with 80% emulsion/20% ANFO explosive is computed as follows:

Diameter of blasthole ....270 mm
Height of explosive charge ....7 m
Density of explosive charge......................................1.12 g/cc
Mass of explosive charge:..$\pi \times (0.27/2\ m)^2 \times 7\ m \times 1120\ kg/m^3 = 449$ kg
AN content of the emulsion: ....~75%
AN mass in charge per hole ....449 kg x 75% = 337 kg per hole

The amount of AN dissolved from the charge in each hole is computed as follows:

AN dissolution rate: ....1% per day (see Figure 2-1)
Exposure time: ....3 days (between loading and detonation)
AN dissolved from each hole:....................................1%/day x 3 days x 337 kg/hole = 10 kg/hole

The concentration of AN in the water surrounding the hole is computed as follows:

AN dissolved in water..10 kg
Water associated with each hole ....4,270 L
Average AN concentration in hole: ....2,366 mg/L

This concentration is well below the solubility of ammonium nitrate at Diavik water temperatures.

For a blast of 100 holes, 1 tonne of AN will be lost solely from leaching by static water, ignoring all other causes.

2.4.3 Alternative Explosives that do not contain AN

Basically, there aren't any that are practical, economic, safe to handle, and environmentally benign. All types of military explosive, such as TNT, RDX, Comp B, are very expensive and have more severe environmental problems than AN. Any type of self-explosive, such as those mentioned, or packaged product, has to be transported and stored as an explosive, unlike AN, which is classed as an oxidizer. It might be possible to make an emulsion explosive that contained only potassium or sodium nitrate, but it would not work very well as little gas would be produced in the explosion, unlike with ammonium nitrate. Blasts need gas pressure to heave and scramble the blasted rock so that it can be dug easily. Emulsions are the most water-resistant form of explosives based on ammonium nitrate, so they are the most appropriate type to be used at Diavik.

2.4.4 Mitigation of AN Loss in Pits A418 and A21

Exactly the same methods for mitigation of AN loss can be used in pits A418 and A21 as described here for pit A154, with the same results to be expected.

2.4.5 Mitigation of AN Loss in Underground Operations

In the dry permafrost areas, the blasting agent ANFO would be an appropriate choice. This is providing that SoP's are in place and the miners trained and supervised to avoid the following AN losses:

- ANFO spills
- Blowback from loading equipment
- Discarding of unused ANFO (rather than returning it to the magazine).

For the wetter areas a repumpable emulsion would be the best choice. Again, care would need to be taken to avoid overloading boreholes, avoid misholes, and follow procedures to clean up spills.

3. WATER MANAGEMENT

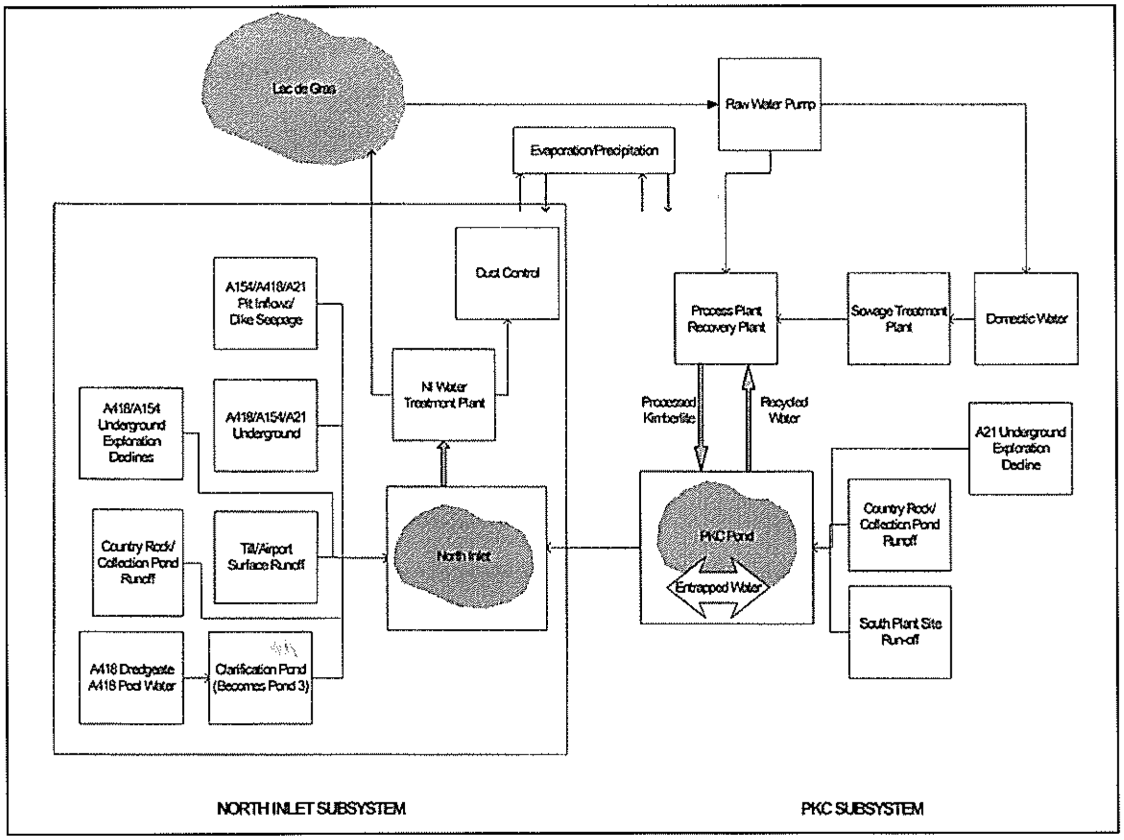
3.1 Water Management System

The Diavik project utilizes a dual-circuit water management system, as follows:

1. North Inlet Circuit. This circuit currently serves to collect all water from surface and underground mine dewatering (including pre-mining lake drainage) and directs the water to the North Inlet. Water is discharged through a TSS and phosphate treatment plant for discharge to Lac de Gras.
2. Processed Kimberlite Containment (PKC) Circuit. This circuit currently serves to collect all water that does not originate from mining activities, including processing, municipal, and washdown water. This circuit is currently operated at zero-discharge, with makeup water being drawn from Lac de Gras.

The water management system is shown schematically in Figure 3-1 (DDMI, 2006a).

Figure 3-1: Diavik Water Management System



3.2 The North Inlet Circuit

The North Inlet circuit comprises the following principal sources of water:

1. A154 Surface Mine Dewatering (including dredgeate, dike seepage, mine dewatering, and in-mine well system)
2. A418 Surface Mine Dewatering (including dredgeate, dike seepage and mine dewatering)
3. A21 Surface Mine Dewatering (including dredgeate, dike seepage and mine dewatering)[2]
4. A154/A418 Underground Mine Dewatering (including development and operation)
5. A21 Underground Mine Dewatering (including development and operation)[1]
6. Surface water management from country rock pile, till pile, airport, and other areas tributary to the North Inlet.

All of these sources are combined, and discharged to the western end of the North Inlet. The North Inlet is a portion of Lac de Gras that has been segregated as a water storage area, by construction of a dike across the eastern mouth of the inlet. Water is discharged to Lac de Gras from the eastern end of the North Inlet after treatment in the North Inlet Water Treatment Plant (NIWTP) for removal of TSS and phosphorus.

This circuit is the only circuit that currently handles significant loadings of ammonia, and is the only circuit which discharges significantly to Lac de Gras. Accordingly, this circuit is the only circuit which will be directly considered in this review of ammonia at the Diavik project.

3.3 Water Management Ammonia Reduction Options

Modifications to the water management system have been considered by DDMI and the WLWB Panel to achieve a reduction in ammonia concentrations in water being discharged to Lac de Gras. The options identified are reviewed with respect to ammonia reduction in this section.

3.3.1 Mine Perimeter Flow Mitigation Measures

The bulk of the inflow water to the A154 surface mine (which is the bulk of the mine inflow to the project at present) flows in through Dewey's Fault, which acts as a direct conduit from Lac de Gras. As a result of this inflow, the base of the A154 surface mine is always wet, and inflow occurs a considerable distance up the side of the mine slope. This is material with respect to ammonia because the blastholes that are drilled and charged in the lower levels of the mine, and in the trace of the fault zone, are all flooded. This enhances dissolution of ammonium nitrate when the holes are charged for blasting, and contributes a significant proportion of the ammonium nitrate loss that occurs in the project.

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[2] The dewatering, dredging, surface mining, and underground mining of A21 is not yet underway, and may not occur, depending on grade, investor approval, and other considerations. It is included in the water management plan and ammonia computations as a contingency, on the conservative assumption that it will in fact proceed.

Ammonia mitigation would therefore be enhanced if the base of the mine could be drilled, blasted, and mined without flow from the fault system entering the mining level.

DDMI considered a number of methods of reducing inflow to (particularly) the A154 mine. These methods are as follows:

- Permeability reduction: This would be achieved by one or a combination of grouting, ground freezing, or slurry walls, placed across Dewey's fault to prevent direct flow through the treated portion of the fault to the mine.
- Dewatering: Wells would be installed in Dewey's fault, and possibly in the remainder of the perimeter of the mine, to intercept flow to the mine.

Numerical modeling of the options suggests that even the most aggressive combination of grouting and dewatering would reduce the inflow to the A154 surface mine by approximately 40%. The remaining 60% of inflow would enter the mine via pathways that pass beneath or around the grouting/dewatering curtain. This finding is in accord with the Panel's experience with inflow mitigation in comparable conditions.

The maximum predicted level of inflow reduction would not render the lower mine benches, or the blastholes in them, significantly less wet than they would be without any inflow mitigation. As wet blastholes, and transport of dissolved ammonium nitrate from them into the water management system, is the principal cause of the ammonium nitrate discharge problem that is to be mitigated, no significant reduction of mass of ammonia released from the mining operation would be expected to occur as a result of implementation of this flow mitigation measure. This is not to say that mine inflow reduction strategies might not be worth implementing for other reasons, including slope stabilization and mining efficiency. However, even if they were implemented, no credit can or will be taken for them by the WLWB Panel in respect of ammonia mitigation.

While there might be a reduction in the inflow to the mine as a result of these measures, this reduction would have no positive impact on the concentration of ammonia in the discharge from North Inlet; indeed, if the flow reduction were sufficiently large, it would cause an increase in the concentration of ammonia at discharge, as the same mass of ammonia would be diluted with less mine water.

The conclusion for ammonia reduction by perimeter mine inflow reduction is:

- Practical, but not effective.

3.3.2 In Mine (Small-Scale) Flow Mitigation Measures

In-mine flow mitigation has been considered to be achieved by a range of methods, including the following (DDMI, 2006a):

- Horizontal drains
- In-pit wells
- Pit wall grouting
- Seepage collection on benches

These flow mitigation techniques collect or deflect inflowing groundwater at or above the level of the operating benches. Accordingly, even fully effective implementation of these technologies would not be expected to have any tangible impact on ammonia release from the blasting operations that take place below the level of these mitigation measures. The Panel disagrees with the claim by DDMI (2006a) that "Implementation of this option will also contribute to ammonia mitigation as the amount of pit wall seepage water that could come into contact with explosives products or residue will be reduced, as will the amount of water collecting in the pit sump." As noted above, partial reduction in inflow to the mine will not significantly reduce ammonia losses on the lower levels where the blasting takes place, but may reduce the diluent water transporting the same mass of dissolved ammonia, resulting in higher concentrations of ammonia in both the mine effluent and the discharge from the North Inlet to Lac de Gras.

The conclusion for ammonia reduction by in-mine inflow reduction or control is:

- Practical, but not effective.

3.3.3 Drainage to the Underground Mine

Drainage to the underground mines that are being developed beneath the surface mines provides an opportunity to dewater the surface mine, and draw the top of the zone of saturation below the base of the surface mine. Successful implementation of this strategy would result in relatively dry surface mining, including all aspects of the blasting cycle. Accordingly, successful drainage from the underground mine would serve to significantly reduce the release of ammonium nitrate from blastholes in the lower levels, and within Dewey's Fault.

Drainage of the water currently exiting Dewey's Fault and other features into the underground mine is feasible. The underground development to support underground drainage is already accessed, both for the A154 kimberlite pipes and the A418 pipe. Dewatering from underground is expected to involve somewhat higher flows than the corresponding dewatering from the surface, but no greater flow than would occur in dewatering the underground mining area.

As noted by DDMI, drainage to the underground is included in the base case for water management, as development and dewatering of the underground mines is already planned and being executed. However, the timing of underground drainage is not currently early enough to affect the remaining A154 surface mining or the early portion of the A418 surface mining. Accordingly there will be no incremental cost for this ammonia mitigation method, unless it is moved forward specifically to facilitate ammonia mitigation in the surface mines.

Drainage to the underground mine will result in essentially dewatered conditions in the A154 surface mine, and subsequently in the A418 surface mine. When the underground mine drainage becomes effective, the ammonia loss rate from the surface mines will revert to that of essentially dry conditions, as existed prior to significant mine water inflow to the mine. The historic ammonium nitrate loss data for the four years of operation are shown in Table 3-1. The ammonia loss in 2003 was for the mine before water greatly impacted the blasting operation. Based on this data, it is assumed that the ammonium nitrate loss rate for a surface mine with successful dewatering from underground would be 0.924%.

The conclusion for surface mine inflow control by dewatering from the underground mines is:

- Practical and effective - ammonium dissolution rate reduced to 0.924%

Table 3-1 - Historic Ammonium Nitrate Losses during Mining

YEAR	Mine Flow	NH4-N	NH4-N	AN Equiv	AN Used	AN loss
	m3/day	mg/L	tonne/yr	tonne/yr	tonne/yr	%
2003	7109	6.6	17.0	96	10400	0.924%
2004	10507	7.0	27.5	155	9700	1.6%
2005	14089	6.0	30.5	172	8700	2.0%
2006	17644	4.8	30.8	174	7700	2.3%

3.3.4 Diversion of A418 Surface Mine Water to the PKC Circuit

The water from the A418 surface mine operation can be diverted to the PKC circuit. This water potentially contains significant ammonia from the extensive use of ammonium nitrate as the explosive, in particular in the early phases of mining, when the stripping ratio is high and the great majority of the explosive is used. Diavik (2006b) anticipates that the flow from the mine will be relatively small (approximately 500 m^3/day), while the ammonium nitrate use will be relatively large (up to 9,700 tons per year). This combination poses the potential for a high concentration of ammonia to be contained in the pumped water.

The PKC circuit currently runs at a water balance deficit of 1,200,000 m^3/day, which is anticipated by Diavik to reduce to between 250,000 m^3/day and 500,000 m^3/day (Diavik, 2006a). As the expected flow from the A418 surface mine is currently predicted to be approximately 500 m3/day (182,500 m^3/year)(Golder, 2006), it appears that this water can beneficially be used in the PKC circuit, reducing the amount of Lac de Gras water that is drawn into the system, and permanently removing the ammonia component in the water from discharge to Lac de Gras.

It is possible that the flow expected at the A418 Surface Mine will turn out to be greatly in excess of the flow predicted by the Golder groundwater model (Golder, 2006a). In this event, the direction of all the flow from the mine to the PKC would not be practicable, as the flow would exceed the current water deficit in that circuit (currently between 700 and 3,500 cubic meters per day). In this event, the excess water above the deficit would be directed to the North Inlet, as in the base case.

The conclusion for ammonia reduction by diversion of A418 Surface Mine water to the PKC circuit is:

- Practical and effective - deletion of all ammonium input from A418 surface mine from North Inlet water management circuit.

3.3.5 Expansion of the North Inlet Storage Capacity

The North Inlet dead storage capacity currently stands at 1,250,000 cubic meters. Expansion of the facility planned for 2007 is expected to add a further 2,000,000 cubic meters to the capacity of the facility (DDMI, 2007). With judicious planning, this additional capacity could also add 2,000,000 cubic meters to the minimum storage capacity, particularly in the winter, when biological degradation of ammonia is at its lowest. This additional storage capacity has the ability to route ammonia through the system, potentially reducing ammonia concentrations in the water.

Management of the proposed expanded North Inlet to minimize ammonia discharge to Lac de Gras is considered by the Panel to be practical at Diavik. Reductions may not be realized when water flow rates are increased significantly as the mining operations expand.

The conclusion for ammonia reduction by expansion of North Inlet storage is:

- Practical and effective - ammonia reduction due to routing and biological destruction of ammonia during the ice-free months.

3.3.6 Segregation of Mine Water

Mine water inflow could be segregated into a high ammonia stream and a low ammonia stream. This could be achieved by dewatering the A154 and A148 mines from specifically driven underground drainage adits. This water would in general not come into contact with ammonium nitrate blasting compounds, and would therefore have a relatively low ammonium concentration. Water that comes into contact with production blasting would be collected separately in the surface mine workings and in the underground mine workings, and would therefore have a relatively high ammonium concentration.

Once segregated, the high ammonia water could be directed to the PKC circuit, where the ammonia contained within it would be permanently sequestered. If there were insufficient capacity in the PKC circuit to accommodate the high ammonia water, the (presumably small) excess could be treated by a packaged treatment plant, and discharged to the North Inlet.

The low ammonia water would be pumped to the North Inlet, as now, and would ultimately be discharged to Lac de Gras after passage through the North Inlet Water Treatment Plant to remove TSS and phosphorus.

Segregation of mine waters in the manner contemplated is considered by the Panel to be practical. However, the extent to which dissolved ammonia released from the mining operation can be collected (or indeed would be generated in the dewatered mines) is not clear. Accordingly, the ammonia control contemplated in this option is not considered to be practical for application at Diavik.

The conclusion for ammonia reduction by segregation of high ammonia mine water from relatively clean mine inflow water is:

- Possibly practical and effective: Ammonia from the mine could be removed from the system with construction of a plant to treat water in excess of the make-up water capacity of the PKC system.

4. TREATMENT

The WLWB Ammonia Review Panel conducted an evaluation to determine practical treatment methodologies to reduce ammonium nitrate discharge to Lac de Gras from the Diavik water management system. This evaluation was performed by panel member Dr. David Koren, of CANMET-MMSL.

4.1 Technology Reviews of Ammonia Removal Water Treatment Technologies by DDMI

As part of this work the panel reviewed the technology evaluation that was included in the Draft Ammonia Management Plan (DDMI, 2006), Ammonia Discussion Paper and Addendum (DDMI, 2006a) as well as the original Technology Review performed by NISHI-KHON/SNC Lavalin for DDMI (NK/SL, 1996). In order to ensure important information was not overlooked other literature sources were reviewed, these other documents and searches are described below.

4.1.1 Literature search at CANMET-MMSL

A literature search was performed through the CANMET library in December 2006 using "Compendex and Dialog". Coverage in these databases varies depending on the journal but generally indexes articles from journals and conference proceedings from 1970 until present.

The following key words were used in the search, with the following results:

1. Nitrification of toxic ammonia from mining and industrial wastes (includes nitrification in reactors and in wetlands and ponds)
2. Chemical oxidation systems for removal of toxic ammonia from mining and industrial wastes (this includes chlorine, ozone and UV technologies)
3. Membrane separation technologies to remove toxic ammonia from mining and industrial wastes
4. Zeolites for removal of toxic ammonia from mining and industrial wastes
5. Snowmaking / Land Treatment for effluent treatment from mining and industrial wastes

The abstracts of all of the documents identified were reviewed and only those pertinent to this project were obtained and then further reviewed.

4.1.2 Ammonia Control Consortium

The panel is aware of work of the Ammonia Control Consortium that CANMET coordinated in the 1990's (CANMET, 1995). This consortium was made up of 11 mining companies from across Canada; its goal was to investigate methods by which ammonia could be controlled at a mine site. As part of its work it reviewed and performed research examining various treatment options, including:

- physical methods (e.g. liming/gasification, atmospheric freezing, precipitation/ crystallization, flotation and gravity separation methods),
- chemical methods (e.g. ozone, chlorine, hydrogen peroxide, Caro's acid),
- electro-oxidation,
- separation processes (e.g. ion exchange, solvent extraction and membranes), and
- biological methods (e.g. use of enzymes, constructed wetlands, nitrification and denitrification)

The consortium briefly examined source control and the effect Best Management Practices had in controlling the ammonia released. In the discussions held with the consortium members it was felt that good housekeeping practices are generally able to reduce ammonia concentrations to below 10 mg/L ammonia. Furthermore, in wet mines it was recognized that the use of the more expensive gel explosives is often practiced to reduce ammonia losses.

From the technologies reviewed, two modules were selected for demonstration by the consortium members: zeolite adsorption/ elution and biological degradation. This set of modules was run at a mine site for 50 days and produced an average effluent concentration of 10 mg/L. Preliminary capital and operating cost estimates were provided (in 1995 dollars, here updated to 2007 dollars) for the combined zeolite (ion exchange) and biological process based on the treatment of 5,760 m3/day of effluent containing 25 mg/L ammonia. The one time capital cost was estimated to be $2.3M, while the operating cost was estimated at $1.6M/year. The largest operating cost is for the cost of soda ash ($900K/year) which is used to elute the zeolite and at the same time used as a carbon source for the nitrifying bacteria. The advantages of this combination of processes was that the zeolite, which was less sensitive to process changes and temperatures, could be used to produce a consistent and concentrated ammonia feed solution for a biological process. Further work with the zeolite process (Molnar, 1994) treating a process stream confirmed that it is capable of producing an effluent containing less than 3 mg/L ammonia consistently. If this process were to be applied at DIAVIK, a heated building would have to be constructed to house it, but the effluent itself would not have to be heated since the zeolite process is not significantly affected by temperature. The biological process would have to treat the stripped ammonia from the zeolite but the volume to be treated would be reduced by 10 times.

4.1.3 Technology Reviews Performed by DDMI and other Consultants

Based on reviews of supplemental sources described above, it is noted that the major technologies have been considered by DDMI and its consultants. There are, however, some areas in which information gaps exist; these are described below.

The first relates to the lack of costing data for the technologies that were reviewed. Even though suppliers were contacted to obtain cost data on the various technologies (NK/SL, 2006), a great deal could also be learned from examining historical costs of the technologies that were used at full scale. This could have enabled further screening criteria to be used, which would have been especially pertinent for the biological options for which no costing data was available from equipment suppliers. As an example, operational costs in 1990 dollars to treat the effluent at the biological plant in South Dakota were reported as 0.10 $\$/m^3$ (Whitlock, 1990; 1995). In addition, preliminary design and cost estimates were presented by Anoop et al. (2001) for a 6000 m^3/day Rotating Biological Contactor plant to treat mine effluent containing 37 mg/L ammonia. The capital cost in this latter example was $3.75 million while the operating cost was estimated at $620,000 per year. Data to estimate these costs were provided by a representative of John Meunier; further estimates for biological treatment equipment were obtained from Seprotech. These suppliers should be contacted to get cost estimates for the biological treatment plants in order to complete the analysis in the Nishi-Khon/SNC Lavalin report (NK/SL, 2006).

Further, with regard to the biological treatment option, the recently commissioned rotating biological contactor (RBC) plant at a gold mine in Northern Quebec was not mentioned. This plant is presently treating 6,000 m^3/day of effluent from a gold milling operation that contains various nitrogen compounds, including ammonia and nitrate. The minimum average temperature in northern Quebec for January is –22°C under these conditions the effluent must be heated to 15°C. The ammonia concentrations at this plant average 50-100 mg/L, compared to 10-20 mg/L at Diavik. Discussions held with plant personnel indicate that the plant is working satisfactorily. It is also known that from time to time that this operation sprays their effluent into the air in order to reduce the ammonia concentration in their effluent. The pH of this effluent is fairly alkaline therefore this would be an effective ammonia management strategy.

Finally, given the information provided in Section 4.1.2 above (Ammonia Control Consortium) with respect to the combined zeolite/biological treatment option, DDMI should perform a detailed engineering design on this option. The analysis provided by NK/SL (2006) was not complete since it was performed for a strong acid cation exchange resin and not natural zeolite, and it did not include the biological treatment process and the possible synergies that process may provide. Also, the spent zeolite could be used as a slow release fertilizer (Ming and Allen, 2001) and thus could be used in the remediation (e.g. revegetation) strategies at the mine site thereby reducing disposal costs.

4.2 Treatment Options

DDMI has identified 5 proven commercial technologies that could reliably achieve the original effluent quality criteria of 2 and 4 mg/L and would therefore reduce the effluent ammonia concentration below its present values of 5.6 mg/L maximum monthly average, and 11.3 mg/L maximum daily average. These are (DDMI, 2006a, p.30):

- Biological treatment
- Air stripping
- Ion exchange
- Reverse osmosis
- Breakpoint chlorination

In addition, 5 proven non-commercial and 3 emerging or R&D treatment options that could reliably achieve the original effluent criteria were also identified.

All considered options are listed in Table 2-3 along with a description of their respective environmental risks and other factors that are used to assess their practicality. This information will be used as the starting point for the present treatment review.

Table 4-1 - Ammonia Treatment Options

Treatment Method	Ammonia Treatment 30day/1day	Advantages	Disadvantages	Fuel Use/GHC Release	Chemical Use	Capital Cost*	Annual Cost*	Feasible at Diavik?	Practical at Diavik?
Biological treatment	<2/4 mg/L	Biomass generation	Sensitive; heat water	High	Low	High-Very high	High	Yes: Proven	No: Cost, impact
Air stripping	<2/4 mg/L		NH3 release; seasonal	Moderate	High (pH adjust)	High	Moderate	Yes: Proven	No: Cost, impact
Ion exchange	<2/4 mg/L	Low temp; usable waste	NH3 waste stream	Low	High (regen)	High	Moderate	Yes: Proven	No: Cost, waste
Reverse osmosis	<2/4 mg/L	Low temperature	NH3 waste stream; filter	Moderate	Low	Moderate	High	Yes: Proven	No: Cost, filter
Breakpoint chlorination	<2/4 mg/L	Low temperature	Produces chloramines	Low	Moderate (chlorine)	High	Moderate	Yes: Proven	No: Cost, hazard
Anammox process	Unknown	Waste usable	Unknown performance	Unknown	Unknown	n/a	n/a	Unknown	No: Untried
Lagoon treatment	Varies: NH3 removal	Existing in North Inlet	Seasonal	None	None	None	None	Yes: In use	Yes
Aerated lagoons	Varies: NH3 removal	North Inlet; usable waste	Seasonal	Low	Low	Low	Low	Yes: Proven	Yes
Aeration + pH adjust	Varies: NH3 removal	North Inlet; pH optional	Seasonal; unproven	Low	Moderate (lime)	Low	Moderate	Yes: Unproven	Yes
Floating cattail mats	Varies: NH3 removal	Uses North Inlet	Seasonal	None	None	Small	Small	Yes: Unproven	Yes
Constructed wetlands	Varies: NH3 removal	Biomass generation	Large area; seasonal	Very low	Very Low	Unknown	Low	No: Area limits	No: Not feasible
Land treatment	Varies: NH3 removal	Existing strategy	Large area; seasonal	Low	Very Low	Small	Low	No: Area limits	No: Not feasible
Snow-making	Varies: NH3 removal	Usable in winter	Large area	Moderate (for pumps)	None	Moderate (system)	Moderate (pumping)	Yes: Area tight	Yes: Low Flow

*Cost Ranges: Low = $0-1M Moderate = $1-5M High = $5-20M Very High = >$20M

The environmental benefits are first weighed against the environmental risks to determine the net environmental effect. For this analysis all of the proven commercial technologies were considered to have a net negative environmental benefit at the 5,000-45,000 m^3/day scale given their power requirements, emissions and chemical usage. It is considered that the ion exchange/zeolite process may be applicable to treat small flow/high ammonia concentration streams. An engineering study should therefore be done to determine its feasibility at low flow rates. Given the synergies possible with this combination, further analysis may prove it to be practical. All of the remaining proven non-commercial and emerging/R&D technologies were considered to have a net positive environmental effect.

Continuing the assessment, it was recognized that not all of the remaining options would be practical at the Diavik mine site. To determine the practicality of these options, further criteria were considered, these included: feasibility to be applied at the Diavik mine site; level of confidence of technology operating at a large scale and the capital and operating cost. These criteria were fairly consistent with those used by DDMI in their screening of the treatment options.

Using the inclusion criteria the following are considered to be practical treatment technologies:

- Enhanced Natural Degradation within North Inlet
- Snowmaking
- Temporal segregation

The basic principles of operation of the Enhanced Natural Degradation and Snowmaking treatment options rely to some extent on volatilization of ammonia into the atmosphere. Presently within the North Inlet it is estimated that 17 tonnes of ammonia is being degraded each year, most of which is likely being volatilized. Enhanced degradation could increase this by 20% to 50%, while the snowmaking option could result in a doubling of the present rate[3]. Compared with the possible greenhouse gas emissions that would be generated from the other treatment processes (for example air stripping would produce 31,800 to 267,500 tonnes per year [DDMI, 2006b]), this is considered acceptable. Furthermore, it is known that once the ammonia is released to the atmosphere it dissipates very quickly (Laidler, 1982) and can be transferred 10-100 km and in some cases 100-1000 km (Dragosits et al, 1998). It is known that some ammonia reacts in the atmosphere but most is eventually removed by precipitation or by dry deposition as gases or aerosols (DDMI, 2006b) over this very large area.

4.3 Practical Treatment Options

The criteria for inclusion of an ammonia treatment option in the Diavik water management system are that the treatment option is technically and financially practical, and that inclusion of the treatment technology in the ammonia management system would result in achieving the lowest practical concentration of ammonia in the water released from the project to Lac de Gras.

4.3.1 Increase in North Inlet Containment Volume

DDMI is planning to increase the storage volume within the North Inlet to 3,500,000 cubic meters in 2007. In the short term (2007-2008) this would increase the retention time in the pond but would not likely greatly increase the amount of ammonia degraded since natural degradation processes are more dependent on surface area and not retention time. A modest 20% increase is expected to take place under these circumstances between April and October due to increased biological activity. As the degradation processes are dependent on surface area, the degradation will continue at this rate through the end of the project.

From data presented by DDMI it is known that 17 tonnes of ammonia are presently being degraded naturally within the North Inlet. This degradation takes place between the months of April and October and results in the production of an effluent generally containing less than 5 mg/L. Nitrification is the mechanism that is responsible for this degradation, and it is likely occurring in only the top 0.3-0.6 m of the North Inlet. In the summer months, degradation also occurs due to volatilization since any algae formed increases the local pH as a result of its consumption of CO_2, which shifts the equilibrium towards unionized ammonia which is more easily volatilized. Volatilization rates are dependent on temperature, pH, pond surface area, turbulence and the extent of the ice if any. It is also thought that any nitrate formed could be taken up directly by algal growth. Given the low concentration of phosphate in the North Inlet (less than 0.1 mg/L) it is likely that this latter mechanism plays only a minor role.

The conclusion for ammonia reduction by expansion of the North Inlet pond is:

- Practical and effective - 20% increase in natural ammonia removal

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[3] These increases depend on the actual flowrate and amount of time these options are applied.

4.3.2 Enhanced Natural Degradation within North Inlet

If natural degradation were to be enhanced within North Inlet productivity would resemble that of a facultative lagoon which is capable of producing an effluent containing less than 2 mg/L ammonia. Assuming that natural degradation processes are optimized within North Inlet by aeration, pH increases or a combination of these two it is expected that the short term ammonia concentrations from North Inlet could be reduced to below 2 mg/L for 7 months of the year, likely producing a 50% increase in the ammonia degradation occurring within the inlet.

If aeration were to be introduced either by mechanical surface or submerged diffused aerators, it is also likely that at least some of the inlet could be maintained ice-free throughout the year. This would extend the treatment season within the North Inlet (EPA, 2002), and increase the ammonia destruction rate. Although the Panel could identify no literature reports describing the impact of air injection on ammonia destruction in the north, experience in North Inlet to date indicates that destruction of a minimum of one ton per month would be feasible with this technology.

Due to the size of North Inlet and the cold temperatures at the site it would likely be more practical to divide North Inlet into 3 cells using floating dividers or some other barriers as is suggested by EPA (2002). An aerated lagoon would also be expected to be able to reduce ammonia concentrations to 2 mg/L for 10 months of the year.

Higher rates of degradation could be expected if the pH of the water were adjusted upwards. When the concentration of ammonia is high and increased degradation is required this may be practical but given the predicted ammonia concentrations and the degradation that is already occurring this may not be necessary.

Enhanced natural degradation in ponds of this kind can also be enhanced by addition of biomass. DDMI has proposed the use of cattail mats to achieve this result (DDMI, 2006b). The addition of biomass removes ammonia by volatilization, biological nitrification and denitrification, and biomass uptake. The Panel has been able to identify no application of cattail mats in conditions similar to Diavik, but believes that there is no reason why the technology cannot be successful in reducing ammonia mass in the North Inlet at least during the ice-free periods of the year.

The conclusion for ammonia reduction by enhanced natural degradation in the North Inlet using aeration is:

- Practical and effective - 50% increase in natural ammonia removal

4.3.3 Snowmaking

Due to the climatic conditions at the site, this technology could be practiced for 8 months of the year from September through until April. This is particularly advantageous since these are the months that natural degradation processes in the North Inlet are not as efficient.

Given the amount of natural degradation that is already taking place this technology would only have to be applied to discharge for 6 months of the year. Treatment of all of the mine discharge by snowmaking could result in a 50% reduction in the loading of ammonia being sent to Lac de Gras. Use of this technology would not be necessary after 2015 since at that time ammonia concentrations in the North Inlet are already expected to be below 1 mg/L.

The amount of land required for storage of the snow that is produced from application of this option varies from 1.5 to 6 hectares to treat 100,000 m^3 of effluent. The land requirements for different treatment rates at Diavik are presented in Table 4-2 for snowmaking during the winter:

Table 4-2 - Snowmaking Area Requirements

Treatment Rate	m3/day	5,000	40,000
Period of treatment	days	200	200
Quantity of water treated	m3	1,000,000	8,000,000
Application Rate	ha/100,000 m^3	1.5-6	1.5-6
Area required	hectares	15-60	120-480
Maximum depth of snow	meters	33-8	33-8

Treatment of 1 million cubic meters of water obtained over the winter from a temporally segregated 5,000 m^3/day high-ammonia waste stream over the winter would require approximately up to 60 hectares, while treatment of the approximately 8 million cubic meters of effluent that will be produced in winter would require up to 480 hectares. A possible area to store the snow that would be formed would be the area immediately north of North Inlet. This area would be buried with between 8 and 33 meters of snow by the end of the winter (depending on the site area), assuming that the prior year's inventory had been completely removed prior to new deposition. There is sufficient area adjacent to the North Inlet to accommodate a snowmaking operation of 5,000 m^3/day capacity, but not to accommodate the 40,000 m3/day capacity system. Accordingly, only the smaller system is considered feasible.

Some of the water contained in the snow would sublimate during winter, and the remainder would melt and evaporate and run off in the spring and summer. The snow storage area would be designed so that the run-off would flow into North Inlet. Since most of the ammonia is removed from the snow by volatilization (NK/SL, 2006) this snowmelt would contain little or no ammonia. As the actual performance of the snowmaking process in removing both water and nitrogen from the system, it will be assumed that half the water and half the ammonia is lost to the North Inlet system on an annual basis, and that the input of water and ammonia to the North Inlet occurs in the six months of the summer period.

As the ammonia is volatilized to the atmosphere, any air emission constraints may restrict use of this technology. This technology has been practiced in Montana and total nitrogen was reduced by 87% (NK/SL, 2006).

The conclusion for low-flow ammonia reduction by snowmaking in the winter months is:

- Practical and effective - area is sufficient to allow a relatively thin snow layer.

The conclusion for high-flow ammonia reduction by snowmaking in the winter months is:

- Not practical - insufficient area and unproven technology

4.3.4 Temporal Segregation

Temporal segregation of high ammonia/low volume effluents is considered as a practical option. As with the explosives management options this has the greatest potential to reduce the ammonia load since it would deal with the contaminant at the source before it gets diluted. Temporal segregation options considered are the following:

1. Collection of water emerging in surface mine sumps after in-mine dewatering. Dewatering of surface mines by perimeter well pumping and/or in-mine well pumping is expected to intercept a significant quantity of mine inflow water before it passes through the bench blast areas. Based on experience in the mine, collection of 33% of the inflow by this means is feasible. The ammonium that is released from the emulsion explosive would be dissolved into the remaining surface mine inflow (75%), creating a higher ammonia concentration, lower quantity water stream than would occur without these actions. Some ammonia would still enter the main dewatering system by infiltration to depth; it is assumed that 50% of the ammonia would report to the dewatering system, and 50% would report to the segregated system.
2. Collection of water emerging in surface mine sumps after underground dewatering. Underground dewatering of surface mines will greatly reduce the quantity of water that enters the sumps in the surface mines. Based on experience, interception of 75% of the mine inflow water prior to contact with ammonia from blasting by this means is considered feasible. The ammonium that is dissolved into the surface mine inflow would be expected to remain primarily in the relatively small quantity water reporting to the sumps, creating a high ammonia concentration, low quantity water stream. Some ammonia would still enter the main dewatering system by infiltration to depth; it is assumed that 33% of the ammonia would report to the dewatering system, and 67% would report to the segregated system.
3. Collection of water entering the underground mine sumps after underground mine dewatering below ore zone. Underground dewatering below the level of ore extraction in the underground development will greatly reduce the quantity of water entering the underground mine workings, and coming into contact with ammonium nitrate used in blasting. Based on experience collection of approximately 90% of the underground inflow water by this means is feasible. The remaining 10% of water is expected to largely report to in-mine sumps, where it will form a low quantity of high ammonia concentration water. Some ammonia would still enter the main dewatering system by infiltration to depth; it is assumed that 25% of the ammonia would report to the dewatering system, and 75% would report to the segregated system.

In terms of water management options temporal segregation would ensure the most efficient use of any water treatment options since any heating and reagent requirements would be minimized. Due to these reasons it recommended that once high ammonia containing streams are identified and segregated (likely water from surface mines A154, A418 or A21) an engineering study be performed to identify possible treatment options as well as potential storage areas within the mine site, some of which has already been performed (Addendum – Ammonia Discussion Paper, pp. 38-45).

As was noted in this analysis the most viable option for treatment of a high-ammonia stream from temporal segregation appears to be the creation of a separate high ammonia cell within the North Inlet. Given this location, aeration of this cell described above would be an option to treat this water. During the winter months this effluent could be treated using the snow making process described in Section 5.6.2. If other storage areas are identified (e.g. expansion of existing storage ponds) that have more limited space then smaller skid mounted treatment units (e.g. ion exchange) may be more appropriate. Another option that could take advantage of synergies at the site would be to look at the possibility of using any excess capacity within the sewage treatment plant for treatment of these high ammonia streams.

As DDMI has also suggested, any low flow/high ammonia streams could be directed to the PKC water management subsystem, which would have dual benefits of reducing the ammonia discharged as well as reduce the amount of fresh water extracted from the lake. All of these options are practical and would reduce the ammonia load into Lac de Gras and therefore should be implemented as soon as possible.

Finally, as was discussed in Section 4.2, further information is required to make a proper assessment of the combined zeolite/biological treatment option. This treatment technology also has the possibility of meeting the original license requirement of 2 and 4 mg/L and may be practical for segregated streams the site.

Given the predicted flow rates and ammonia concentrations from the Ammonia model, the only stream that would be practical to treat would be A418 from January 2007 until December 2011. Assuming that the zeolite/biological treatment option could reduce the effluent concentration to 2.0 mg/L during this period of time a 95 % reduction in the ammonia concentration in this stream can be expected. However, if the flow from the A418 mine is low as expected, this water can be directed to the PKC circuit, rendering treatment unnecessary.

The conclusion for ammonia reduction by temporal segregation and conventional treatment of a low flow/high ammonia stream is:

- Practical and effective - selection of treatment method dependent on segregated flow rate

5. PREDICTIVE MODEL OF AMMONIA DISCHARGE TO LAC DE GRAS

The effects of the above practical ammonia control options on the concentration of ammonia in discharges to Lac de Gras has been evaluated using a mass balance model of ammonia in the North Inlet circuit, developed by the WLWB Panel members for use in this review. The WLWB ammonia model is calibrated against the observed behaviour of the North Inlet circuit for the period 2003 through 2006. The practical ammonia control options are then applied to the calibrated WLWB ammonia model and the resulting peak monthly and daily ammonia concentrations are computed. The lowest practical peak project ammonia concentrations are selected as the Effluent Quality Criteria.

A detailed description of the WLWB ammonia model, its calibration, and the results of all the analyses performed for this study is contained in Attachment 1 of this report.

5.1 Model Description

The North Inlet portion of the water management system is shown in Figure 3-1. A number of mine elements (A154 and A418 surface and underground mines, and A21 Surface Mine) contribute water and ammonia to the North Inlet, and water and ammonia from the North Inlet is discharged into Lac de Gras.

The model simulates the operation of the North Inlet system by considering the water flux and ammonia flux from the mines through the North Inlet on a monthly basis by cycling through the following steps:

1. It computes the volume of water and the mass of ammonia discharged to the North Inlet by the mine and other components.
2. It computes the amount of ammonia lost during residence in North Inlet;
3. It computes the concentration of ammonia in the North Inlet lake water by dividing the ammonia inventory by the lake volume.
4. It then discharges water through the Water Treatment Plant (WTP) into Lac de Gras, and decrements the water volume and ammonia mass in the North Inlet by the discharged amounts.

5.2 Calibration

The model is calibrated against the observed performance of the water management system for the period 2003 through 2006. The calibration is uses three parameters to relate the mass of ammonium nitrate used in mining to the concentration of ammonia concentration at discharge:

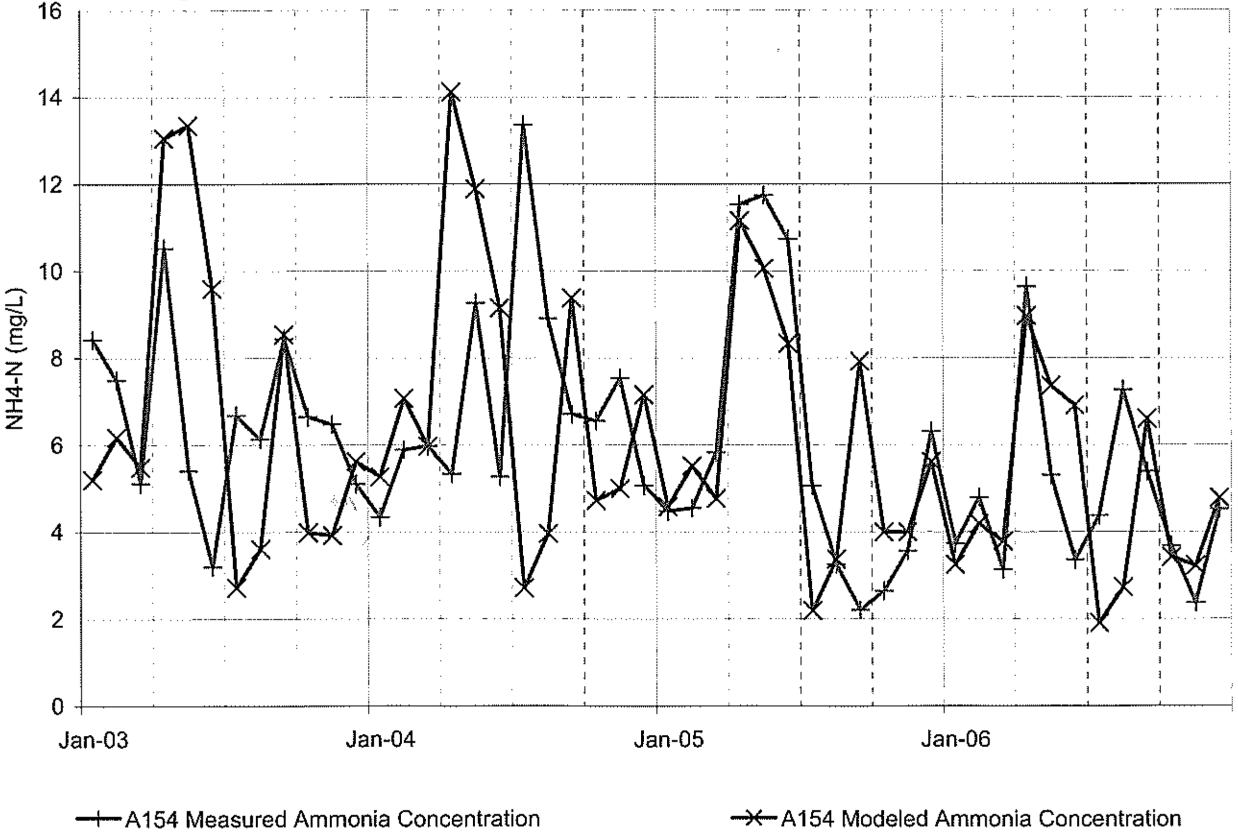
1. Ammonia Loss Rate. This annual parameter is computed from the relationship between the actual ammonium nitrate used in blasting to the ammonia that is discharged from the mining system (Table 3-1).
2. Ammonia Rate Factor. This parameter is developed by calibration to reproduce the observed significant variability in ammonia loss from month to month. The monthly Ammonia Rate Factor that best reproduces the variability of the discharged ammonia concentration is presented in Table 5-1, using data collected from the A154 Surface Mine.

Table 5-1 - Ammonia Rate Factor (%)

Month	Ammonia Rate Factor (%)
Jan	60%
Feb	75%
Mar	70%
Apr	175%
May	170%
Jun	150%
Jul	40%
Aug	60%
Sep	150%
Oct	75%
Nov	75%
Dec	100%

The modeled ammonia concentrations using the above ammonia rate factor are compared to the actual ammonia concentrations for the A154 Surface Mine for the period 2003-2006 in Figure 5-1. The variation produced by the Ammonia Rate Factors set forth in Table 2-2 is very similar to the variation of the actual data, indicating acceptable calibration. Note that timing of peaks is not specifically reproduced: peak concentrations not their timing drive selection of EQC.

Figure 5-1 - Actual vs Modeled A154 Ammonia Concentrations (2003-2006)



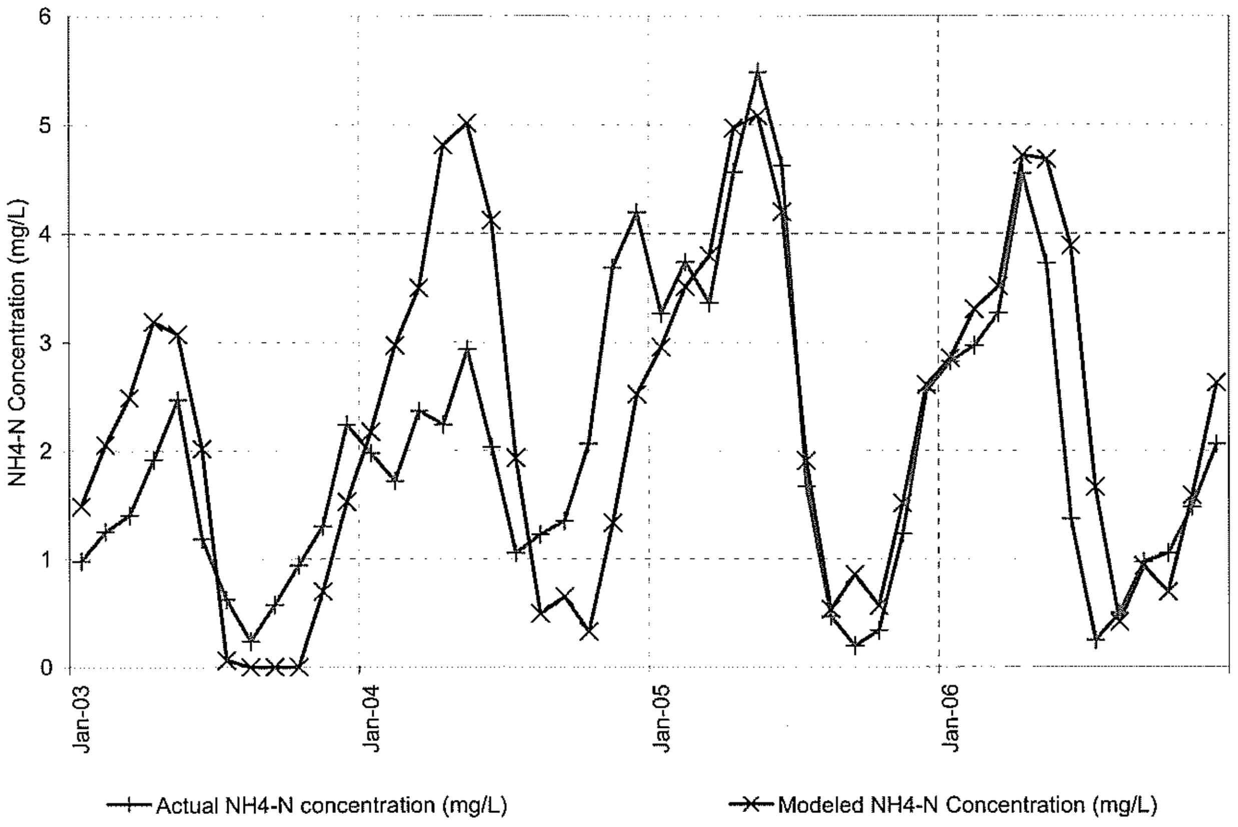
3. North Inlet Ammonia Destruction. This parameter is set equal to the difference between the known amount of ammonia delivered monthly to the North Inlet and the change of inventory of ammonia in the inlet at the end of the month (using the observed pond volume and ammonia concentration). The best-fit ammonia destruction is presented in Table 5-2. The ammonia destruction approximates zero in the winter when the North Inlet is ice covered, and up to 3 tons per month in summer, when the lake is open, warmer, more agitated and more oxygenated.

Table 5-2 - North Inlet Ammonia Destruction Rate

Month	NH4-N Destruction (tons)
Jan	0.0
Feb	0.0
Mar	0.0
Apr	1.0
May	2.0
Jun	3.0
Jul	3.0
Aug	3.0
Sep	3.0
Oct	2.0
Nov	0.0
Dec	0.0
Year	**17.0**

The calibration match between observed and modeled concentrations of ammonia in water discharged to Lac de Gras for the period 2003-2006 is shown in Figure 5-2.

Figure 5-2 - Modeled vs Actual Ammonia at Discharge



5.3 Confidence Limits

5.3.1 Monthly Maximum Ammonia Concentration

The WLWB ammonia model computes the best estimate for the monthly average ammonia concentration for the discharge from the North Inlet to Lac de Gras. The confidence statistics for this prediction are computed by comparing the observed monthly average ammonia discharge concentrations with the modeled concentrations. The graphical results for the 48 analysis pairs for this comparison for the period 2003-2006 are shown in Figure 5-3.

The envelope that contains all the data represents the approximate 95% upper confidence interval for the monthly maximum ammonia concentration. This envelope has been applied to all modeled values to produce a 95% upper confidence limit for the maximum average monthly ammonia concentration for discharge to Lac de Gras in that month. The envelope values represent an increase of the modeled values by a factor that varies from about 6 for low ammonia concentrations to about 2 at high ammonia concentrations.

5.3.2 Daily Maximum Ammonia Concentrations

The WLWB ammonia model computes the maximum monthly concentration for the ammonia discharged into Lac de Gras. For the purposes of developing an EQC for daily grab samples, we have developed a relationship between maximum daily ammonia concentration and monthly average ammonia concentration using the measured data each month. For each of the 48 months in the period 2003-2006 the maximum daily ammonia concentration is plotted against the average ammonia concentration in that month (Figure 5-4). An envelope is fitted to the maximum data to just include all the data. The concentrations represented by this envelope represent approximately the 95% upper confidence limit for the daily ammonia concentration corresponding to a given monthly average concentration.[4]

The envelope containing the daily maxima is the approximate 95% upper confidence limit for the estimate of the daily maximum given a monthly mean. In the model, this factor (which varies from a factor of about 6 to a factor of about 1.5 as the monthly mean concentration increases) is applied to the 95% upper confidence limit of the monthly average ammonia concentration, to give a 95% upper confidence limit on the daily maximum concentration.

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[4] If one of the 48 actual readings falls outside the envelope, the confidence level is given by:

Confidence Level (%) = (1 - 1/48) x 100% = 97.9%

The envelope is actually chosen to just include all the 48 datapoints, so the confidence level exceeds 98%.

Figure 5-3 - Confidence of Modeled Monthly Average Ammonia Concentration

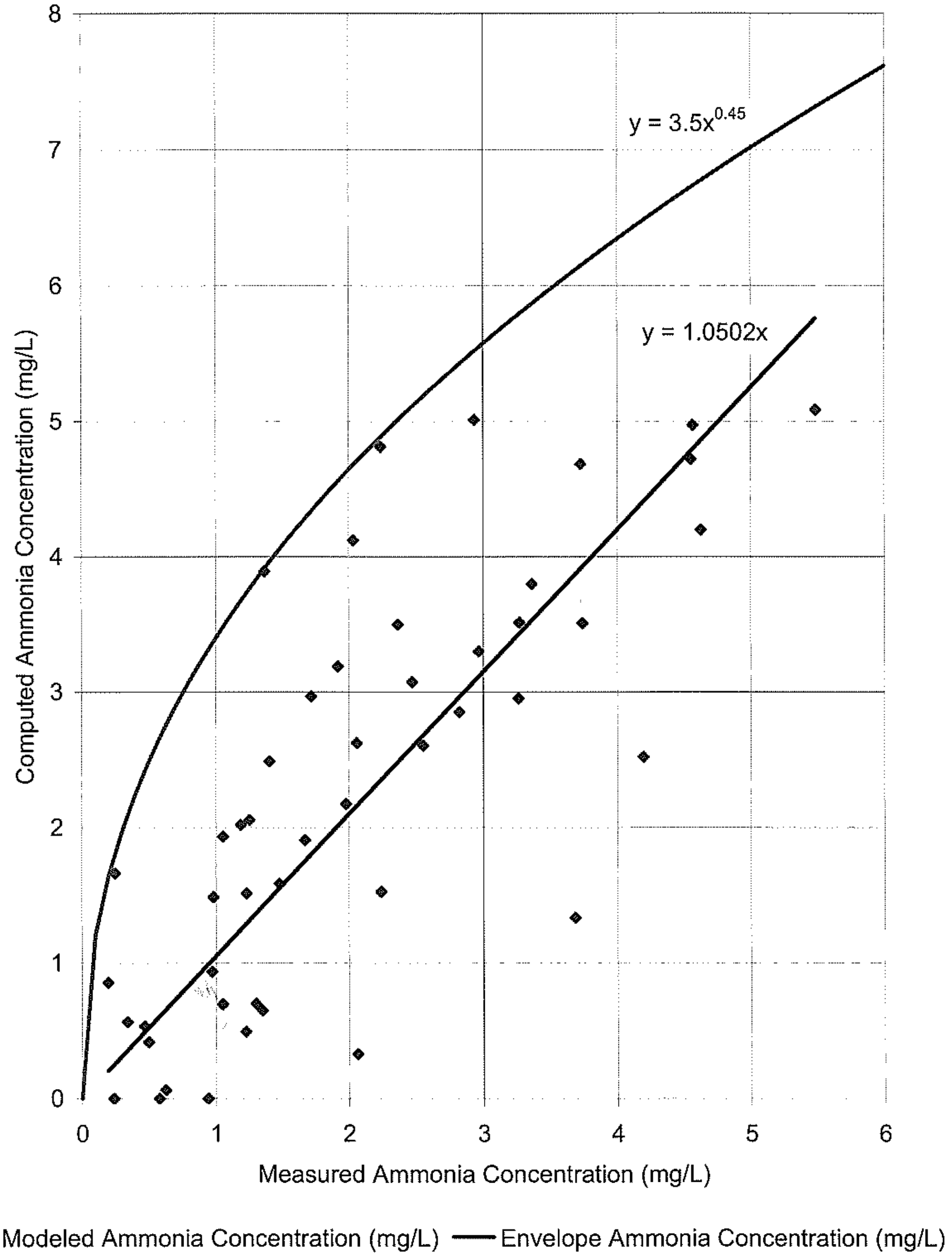
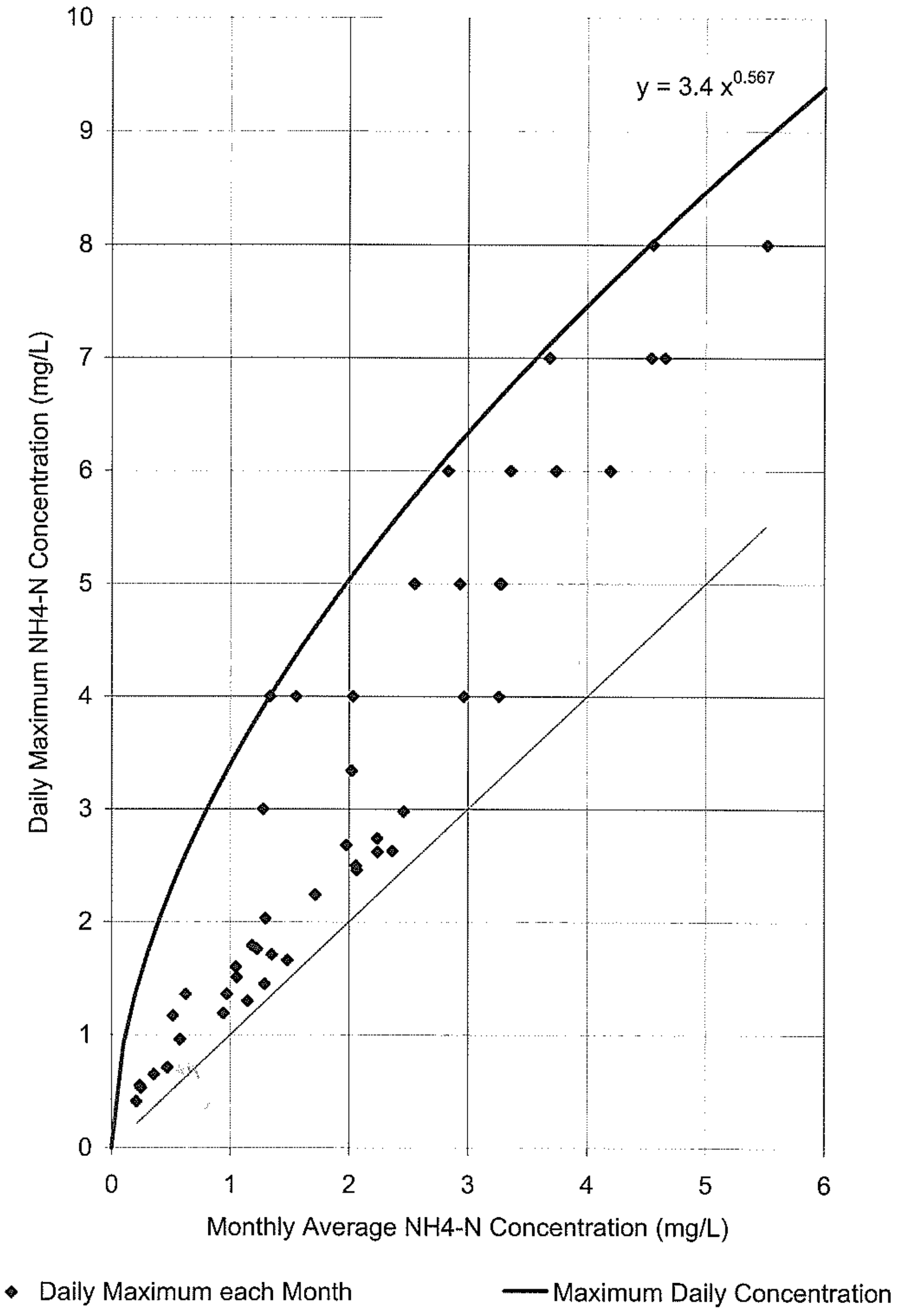


Figure 5-4 - Maximum Daily vs Monthly Average Ammonia



6. EVALUATION OF AMMONIA MITIGATION OPTIONS

6.1 Base Case

6.1.1 Method

The base case analysis is the system where there are no changes in any of the practices currently being performed at the site with respect to ammonium or water management. Specifically:

1. Blasting practices remain as in effect before September 2006, with a 65/35 emulsion/ANFO blend of standard viscosity pumped into boreholes using the original procedures and shot with a single booster
2. Ammonium nitrate usages are as stated in the ADP (see Table 6-1).
3. Mine inflow as predicted in the ADP (see Table 6-1).

Table 6-1 - ADP Mine Inflow and AN Usage

	SURFACE MINE A154		SURFACE MINE A418		U/G MINES A418/A154		SURFACE MINE A21	
Year	Mine Inflow Rate (m^3/day)	Ammonium Nitrate Usage (tonne/yr)	Mine Inflow Rate (m^3/day)	Ammonium Nitrate Usage (tonne/year)	Mine Inflow Rate (m^3/day)	Ammonium Nitrate Usage (tonne/year)	Mine Inflow Rate (m^3/day)	Ammonium Nitrate Usage (tonne/year)
2003	7700	10400	0	0	0	0	0	0
2004	10500	9700	0	0	0	0	0	0
2005	14100	8700	0	0	0	0	0	0
2006	15700	7700	250	0	4100	548	0	0
2007	17200	4900	500	4800	8200	390	0	0
2008	8950	1080	500	9700	24600	340	0	0
2009	700	0	500	7200	40900	210	0	0
2010	700	0	500	2200	39200	131	0	0
2011	700	0	500	280	37400	390	0	0
2012	700	0	500	14	37350	360	2100	2280
2013	700	0	500	0	37300	200	4500	4510
2014	700	0	500	0	38950	250	7200	5610
2015	700	0	500	0	40600	340	0	0
2016	700	0	500	0	40000	370	0	0
2017	700	0	500	0	39500	450	0	0
2018	700	0	500	0	39000	440	0	0
2019	700	0	500	0	38500	390	0	0
2020	700	0	500	0	42600	460	0	0
2021	700	0	500	0	46800	480	0	0
2022	700	0	500	0	42200	380	0	0
2023	700	0	500	0	37700	420	0	0
2024	700	0	500	0	38300	120	0	0
2025	700	0	500	0	38900	0	0	0

Source: Ammonium Discussion Paper (DDMI, 2006a)

4. All water from mines is pumped to the North Inlet circuit.
5. The operating level of the North Inlet will be maintained at 1,250,000 cubic meters, by increasing treatment capacity. Future operations will discharge water to Lac de Gras from the North Inlet at the same rate as water is received in the North Inlet. The discharge will be treated for TSS and phosphate (but not for ammonia).
6. No ammonia treatment activity or enhancement will be practiced at any location.

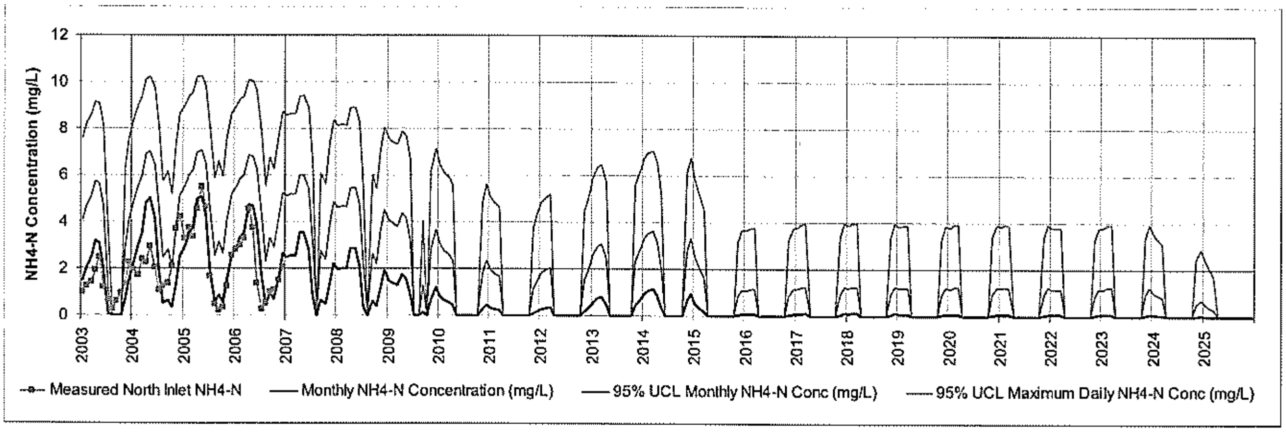
6.1.2 Practicality

The base case is being currently practiced, and is therefore considered practical for implementation for the remainder of the project.

6.1.3 Results

The results of the simulation are presented in Figure 6-1, which shows daily and monthly ammonia concentrations of water discharged to Lac de Gras. The results are presented in Figure 6-1:

Figure 6-1: Ammonia - Base Case



The ammonia concentrations obtained from the analysis are presented in Table 6-2:

Table 6-2 - Ammonia - Base Case

Time Period		2003-2006	2007	2008-2025
Average	mg/L	2.3	1.9	0.2
Maximum 30 Day	mg/L	5.1	3.5	2.9
Maximum 1 Day	mg/L	8.6	7.0	6.2
Maximum 95% UCL 30 Day	mg/L	7.1	6.0	5.5
Maximum 95% UCL 1 Day	mg/L	10.3	9.4	8.9

6.2 Improved Blasting Methods

6.2.1 Method

The first variation on the base case is to reduce the dissolution of the emulsion explosive. A range of techniques that are considered practical and effective are included in Combo #1 (Table 2-3 above):

- Double Priming
- Improved Loading
- 80% Emulsion/20% ANFO Ratio
- Thicker Emulsion
- Reduced Explosives Residence Time
- Improved Stemming Procedures

These measured together are expected to reduce the average ammonium nitrate release to groundwater by 45% and to reduce the peak ammonium nitrate release by 60% (Table 2-3).

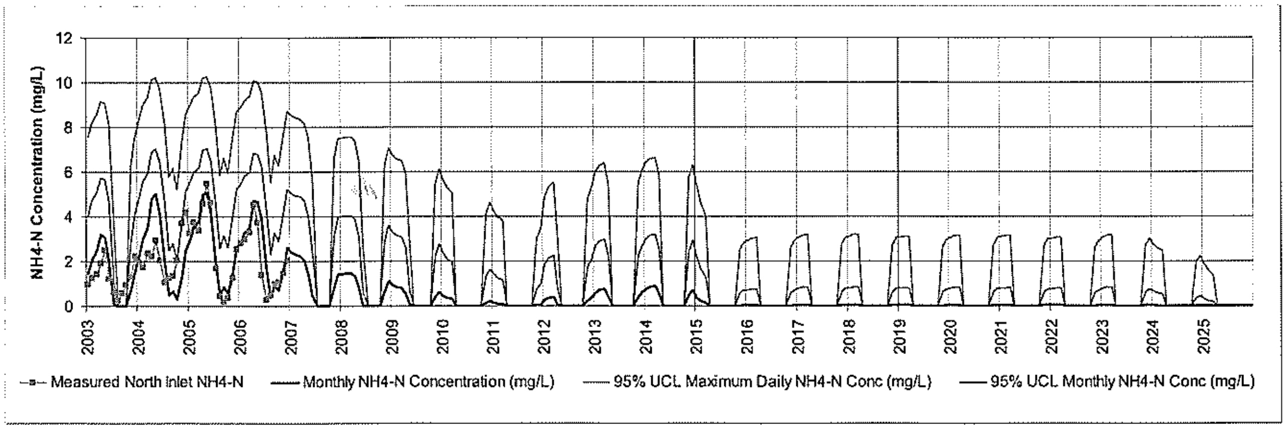
6.2.2 Practicality

The modifications to the blasting approach included in Combo #1 are all considered by the WLWB Panel to be practical (Table 2-3). Application of the elements together is also considered practical. Diavik is currently using 80% emulsion, and thickening it is also feasible. The limitation to two days aging of loaded holes is feasible, requiring somewhat smaller blasts than are currently used in the surface mines at the site, and blast design that accommodates detonation of an incomplete pattern if the time limit is reached. Improved loading and stemming procedures are also feasible. Based on these considerations, the WLWB Panel considers these changes to the blasting system to be practical.

6.2.3 Results

The results of the simulation are presented in Figure 6-2, which shows monthly ammonia concentration of water discharged to Lac de Gras.

Figure 6-2: Ammonia - Improved Blasting Methods



The ammonia concentrations obtained from the analysis are presented in Table 6-3:

Table 6-3 - Ammonia - Improved Blasting Methods

Time Period		2003-2006	2007	2008-2025
Average	mg/L	2.3	1.1	0.1
Maximum 30 Day	mg/L	5.1	2.4	1.5
Maximum 1 Day	mg/L	8.6	5.7	4.3
Maximum 95% UCL 30 Day	mg/L	7.1	5.0	4.1
Maximum 95% UCL 1 Day	mg/L	10.3	8.5	7.6

These results represent an approximate 48% reduction in maximum 30 day ammonia concentration over the base case.

6.3 Improved Blasting Methods and Lining Wet Blastholes

6.3.1 Method

The second variation on the base case is to utilize the improved blasting methods outlined in 6.2.1, and, in addition, utilize a flexible polyethylene (PE) or similar liner in blastholes where flowing water is suspected, without attempting to dewater the holes first. This liner would prevent contact between the water and the emulsion explosive, as well as largely eliminating losses of explosive into cracks and fissures. The WLWB Panel considers that this approach to ammonium nitrate loss to the water management system will be more effective than the use of the improved blasting methods in Combo #1 alone. This approach (Combo #2) is expected to reduce average ammonia loss by 55% over the base case, and peak loss by 70% over the base case (Table 2-3).

6.3.2 Practicality

This variation requires utilization of a flexible PE liner, such as is used in sleeving rock and soil samples during shallow exploration drilling. These sleeves are available, and are sufficiently strong to withstand the contemplated use. The availability of liners that can be used in the extreme cold of the arctic winter is not known. There are no methods described in the literature for inserting such liners into water-filled holes and loading emulsion explosive into them, presumably because the use of emulsion is generally considered to avoid the use of liners altogether. Conceptually, threading the liner onto the explosive delivery hose and lowering both together into the borehole is feasible. The wet conditions in the pit bottom at Diavik and need to reduce ANDR to a practical minimum indicate that such a technique should be developed in the mine.

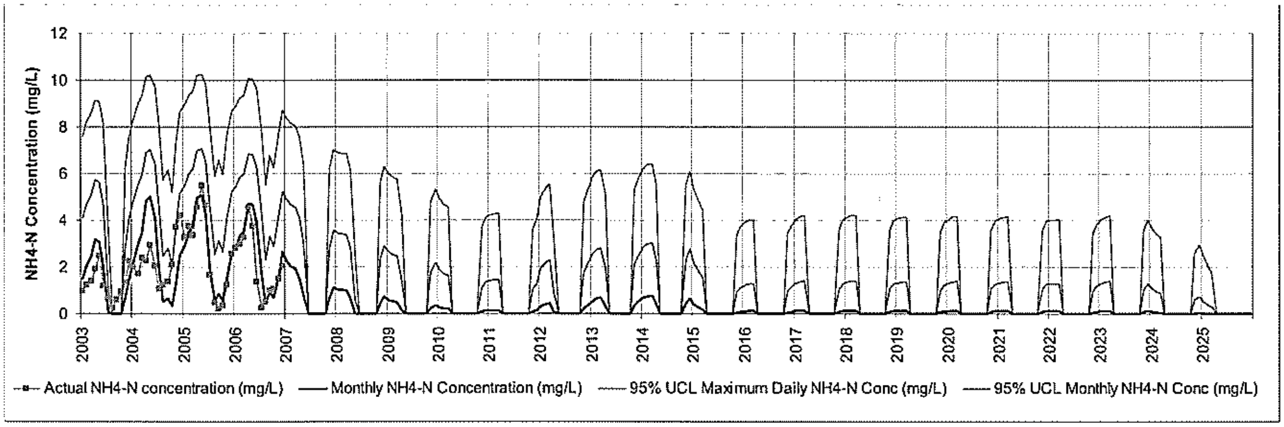
The use of the liners will largely eliminate the loss of approximately 3% by weight of ammonium nitrate that occurs in the current blasting method, and would have a large effect on ammonium concentration spikes in mine water. In addition, emulsion explosive in a liner would be in pristine condition when it is shot, as there would be no potential for water leaching. Therefore it should function better in the bad areas of the pit than current blasting practices and there may be some potential for spreading the blasthole pattern (i.e. using less explosive).

Accordingly, the WLWB Panel considers that the use of blasthole liners for very wet holes would be feasible and could even be revenue positive if it did not slow down the loading operation too much (i.e. implementing a liner program could save more than it would cost). Based on these considerations, the WLWB Panel considers this change to be practical.

6.3.1 Results

The results of the simulation are presented Figure 6-3, which shows monthly ammonia concentration of water discharged to Lac de Gras.

Figure 6-3: Ammonia - Improved Blasting/ Liners



The ammonia concentrations obtained from the analysis are presented in Table 6-4:

Table 6-4 - Ammonia - Improved Blasting/ Liners

Time Period		2003-2006	2007	2008-2025
Average	mg/L	2.3	0.9	0.1
Maximum 30 Day	mg/L	5.1	2.3	1.0
Maximum 1 Day	mg/L	8.6	5.5	3.6
Maximum 95% UCL 30 Day	mg/L	7.1	4.9	3.4
Maximum 95% UCL 1 Day	mg/L	10.3	8.4	6.9

These results represent an approximate 64% decrease in maximum 30 day ammonia concentration over the base case.

6.4 Dewater Mines by Underground Drainage

6.4.1 Method

The third variation on the base case is to drain all surface mine inflow to the underground mines. This strategy would result in substantially dry mines in which current blasting practices could be undertaken with minimal ammonium nitrate loss. The WLWB Panel considers that this would result in an ammonium nitrate loss in surface mines equivalent to the first year of mining the A154 Surface Mine, which was 0.924% (Table 3-1).

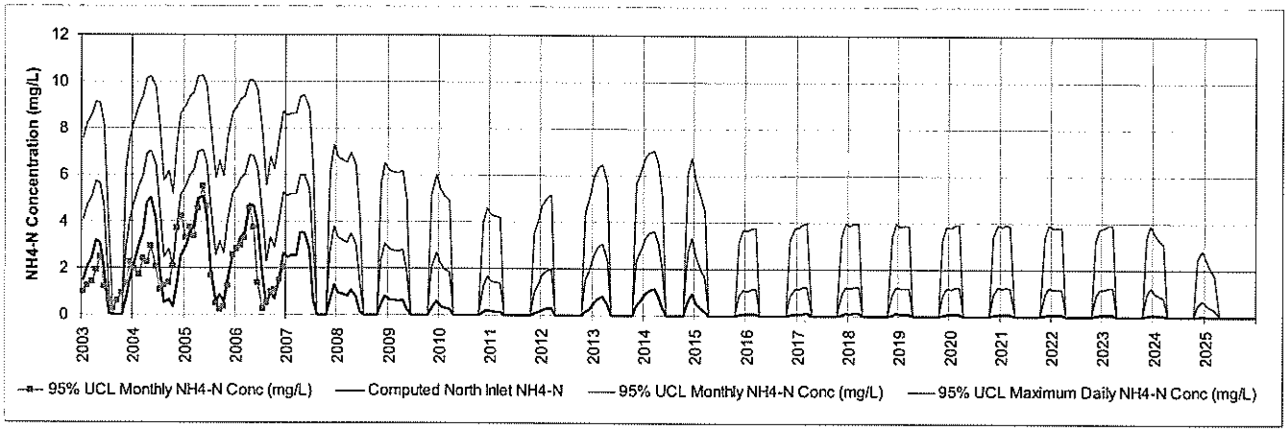
6.4.2 Practicality

Drainage of surface mines by removal of water from the underground workings is feasible and practical at Diavik, at least for the A154 and A418 Surface Mines. The WLWB Panel considers this change to be practical (see Section 3.3.3).

6.4.3 Results

The results of the simulation are presented Figure 6-4: Ammonia - Drainage to Underground Mines, which shows monthly ammonia concentration of water discharged to Lac de Gras.

Figure 6-4: Ammonia - Drainage to Underground Mines



The ammonia concentrations obtained from the analysis are presented in Table 6-5:

Table 6-5 - Ammonia - Drainage to Underground Mines

Time Period		**2003-2006**	**2007**	**2008-2025**
Average	mg/L	2.3	1.7	0.1
Maximum 30 Day	mg/L	5.1	3.5	1.1
Maximum 1 Day	mg/L	8.6	7.0	3.8
Maximum 95% UCL 30 Day	mg/L	7.1	6.0	3.6
Maximum 95% UCL 1 Day	mg/L	10.3	9.4	7.1

These results represent an approximate 60% decrease in maximum 30 day ammonia concentration over the base case.

6.5 Pump A418 Surface Mine Water to the PKC Circuit

6.5.1 Method

The forth variation on the base case is to pump all water developed in the surface mining of the A418 Kimberlite Pipe to the Processed Kimberlite Containment (PKC) Circuit. This mine development has large ammonium nitrate use in the period 2007 through 2009, with a relatively low expected mine inflow. The water expected to be generated in this surface mine is less than the amount of PKC system make-up water currently being drawn from Lac de Gras. Thus diversion of this water to the PKC system will reduce the amount of water drawn into the overall project, improve the water balance of both the PKC water management system and the North Inlet water management system, and significantly reduce the mass of ammonia being delivered to the North Inlet circuit.

6.5.2 Practicality

This variation requires installation of piping to direct water from the A418 Surface mine to the PKC water management circuit. This piping represents a small addition to the piping required to connect the A418 Surface Mine dewatering system to the North Inlet water management circuit, which is not considered by the WLWB Panel to be as significant incremental economic cost to the project. The piping that carries the A418 mine water will be in operation on a continual basis, so freezing should not render the pumping of this water to the PKC circuit impractical.

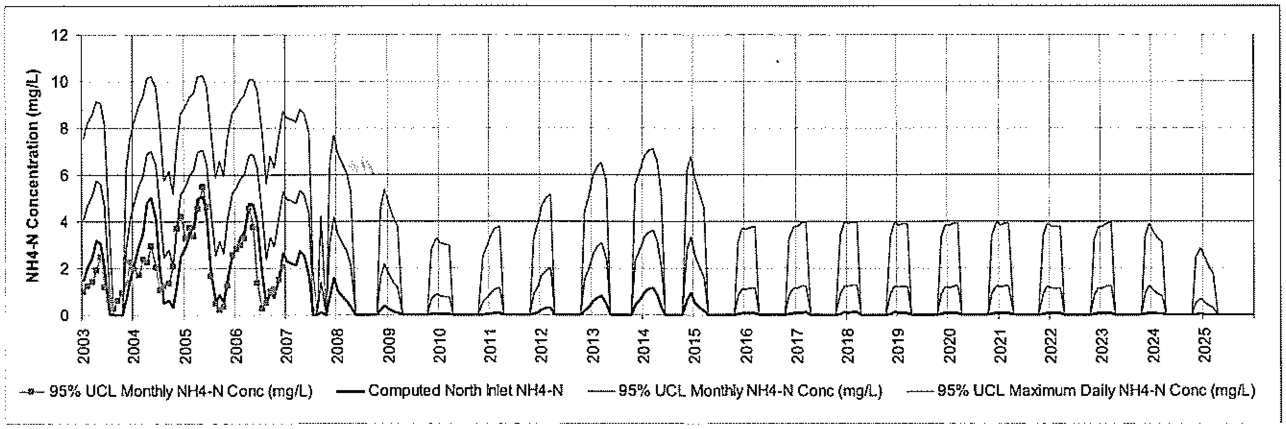
Based on these considerations, the WLWB Panel considers this change to be practical.

However, the inflow to the A418 Surface Mine is not currently established. In the event that the inflow to this mine exceeds the required makeup water flow rate for the PKC circuit (approximately 1,000 m^3/day), this method could not be fully implemented.

6.5.3 Results

The results of the simulation are presented Figure 6-5, which shows monthly ammonia concentration of water discharged to Lac de Gras.

Figure 6-5: Ammonia - A418 Inflow to PKC



The ammonia concentrations obtained from the analysis are presented in Table 6-6:

Table 6-6 - Ammonia - A418 Inflow to PKC

Time Period		2003-2006	2007	2008-2025
Average	mg/L	2.3	1.3	0.1
Maximum 30 Day	mg/L	5.1	2.7	1.1
Maximum 1 Day	mg/L	8.6	6.1	3.8
Maximum 95% UCL 30 Day	mg/L	7.1	5.3	3.6
Maximum 95% UCL 1 Day	mg/L	10.3	8.8	7.1

These results represent an approximate 60% decrease in maximum 30 day ammonia concentration over the base case.

6.6 Increase North Inlet Containment Volume

6.6.1 Method

The fifth variation on the base case is to increase the storage volume in the North Inlet. This can be done (and is proposed by Diavik for 2007) by increasing the height of the west dam by 10 meters, and constructing a dam at the east end (with a height of 5 meters). Based on this change, the storage of the North Inlet will be increased by 2,000,000 cubic meters (to 3,250,000 cubic meters).

The proposed change is being made to more effectively equalize the flows from the project, thereby reducing the peak processing volume required in the North Inlet Water Treatment Plant (NIWTP). However, it will also have the ability to be operated such that the normal minimum operating volume will also be increased, to at least 3.25 million cubic meters. If this approach to operation were adopted, the North Inlet will have the ability to also smooth the ammonium flux through the system due to the storage in the North Inlet, thereby also reducing the peak ammonium concentrations.

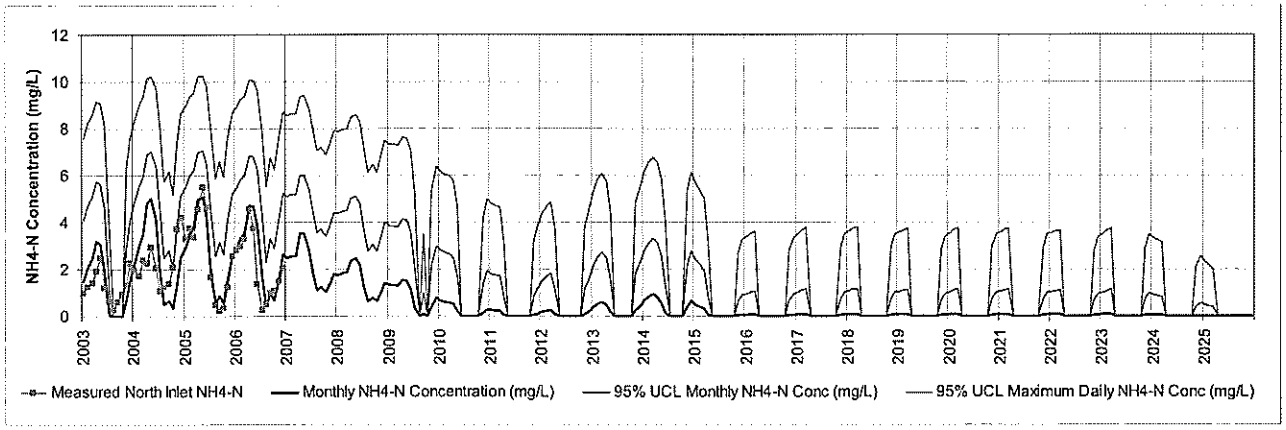
6.6.2 Practicality

This variation requires construction of the dams at either end of the existing North Inlet pond. This change is practical, and any ammonia benefit can be obtained with no incremental cost to the project (as the expansion is being made independent of any ammonia benefit considerations).

6.6.3 Results

The results of the simulation are presented Figure 6-6, which shows monthly ammonia concentration of water discharged to Lac de Gras.

Figure 6-6: Ammonia - Expand North Inlet



The ammonia concentrations obtained from the analysis are presented in Table 6-7:

Table 6-7 - Ammonia - Expand North Inlet

Time Period		2003-2006	2007	2008-2025
Average	mg/L	2.3	2.1	0.2
Maximum 30 Day	mg/L	5.1	3.5	2.5
Maximum 1 Day	mg/L	8.6	7.0	5.7
Maximum 95% UCL 30 Day	mg/L	7.1	6.0	5.1
Maximum 95% UCL 1 Day	mg/L	10.3	9.4	8.6

These results represent an approximate 14% decrease in maximum 30 day ammonia concentration over the base case.

6.7 Increase North Inlet Ammonia Destruction

6.7.1 Method

The sixth variation on the base case is to increase the ammonia destruction that occurs naturally during detention of water in the North Inlet. Evaluation of the current North Inlet water management circuit indicates that there is currently natural destruction of approximately 17 tons per year of ammonia in the North Inlet between April and October each year.

The WLWB Panel considers that it is likely that there will be a natural increase in the destruction of ammonia due to the increase in size and area of the North Inlet pond. Further, the WLWB Panel considers that the use of simple passive biological treatment technology (such as floating mats made of cattails) will likely enhance the destruction of ammonia further. Finally, aeration of the North Inlet can create at least some clear water over the winter, resulting in a continuation of at least some natural destruction of ammonia through the entire year. We believe that by these strategies together, the rate of destruction of ammonia can be increased by 50% over the base-case destruction, and in the winter months can be raised to a minimum of 1 ton per month (Table 4-1).

6.7.2 Practicality

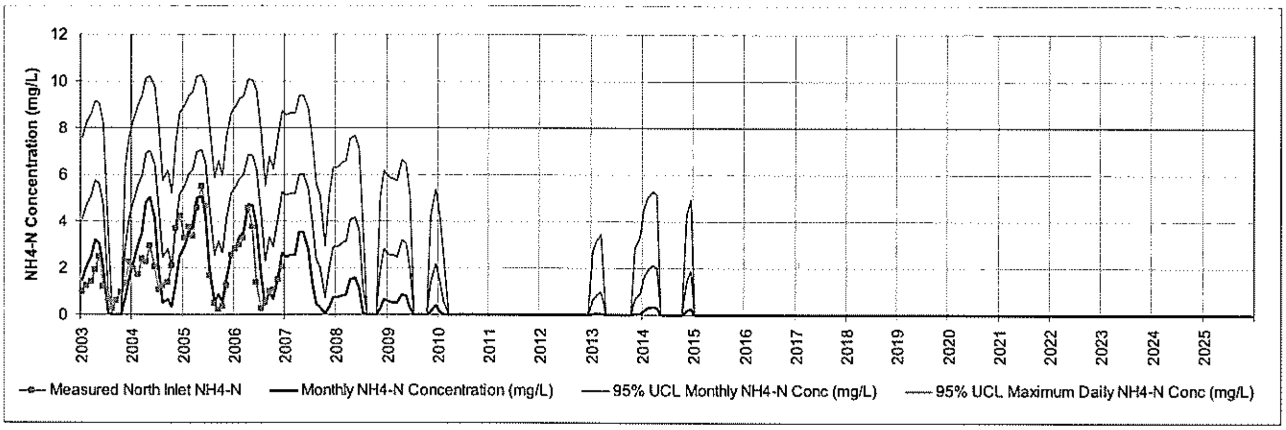
This variation also requires construction of the dams at either end of the existing North Inlet pond. This change is practical, and any ammonia benefit will occur with no incremental cost to the project (as the expansion is being made independent of any ammonia benefit considerations).

Enhancement of destruction by installation of floating cattail mats and aeration of at least some of the inlet over the winter months can be implemented without major operational impact. Accordingly, this control action is considered practical, although the ammonia destruction effects of expansion, aeration, and cattail mats have not been demonstrated at this site.

6.7.3 Results

The results of the simulation are presented Figure 6-7, which shows monthly ammonia concentration of water discharged to Lac de Gras.

Figure 6-7: Ammonia - Enhanced Natural Degradation



The ammonia concentrations obtained from the analysis are presented in Table 6-8:

Table 6-8 - Ammonia - Enhanced Natural Degradation

Time Period		2003-2006	2007	2008-2025
Average	mg/L	2.3	1.7	0.1
Maximum 30 Day	mg/L	5.1	3.5	1.6
Maximum 1 Day	mg/L	8.6	7.0	4.5
Maximum 95% UCL 30 Day	mg/L	7.1	6.0	4.2
Maximum 95% UCL 1 Day	mg/L	10.3	9.4	7.7

These results represent an approximate 29% decrease in maximum 30 day ammonia discharge over the base case.

6.8 Temporal Segregation

6.8.1 Method

The seventh variation on the base case is employ temporal segregation to concentrate ammonia into a portion of the dewatering flow from the mines. This could be achieved by a variety of means:

1. In-mine dewatering to reduce flow through blasting areas.
2. Underground dewatering to reduce flow through surface mine blasting areas.
3. Underground dewatering from below the underground production levels to reduce flow underground blasting areas.

This strategy would result in concentrating the ammonia released during the blasting cycle into a relatively low flow, making secondary treatment and/or disposal of water practical by the following methods:

1. Discharge into the PKC system for ultimate disposal in the tailings pile.
2. Discharge into a snowmaking system in winter, to handle ammonia produced at a time when the natural degradation in the ponds is minimal.
3. Discharge into conventional treatment systems, such as biological/zeolite degradation or reverse osmosis.

For the purposes of the analysis of the impact of temporal segregation on ammonia concentrations into Lac de Gras, underground dewatering has been selected as the temporal segregation option, and snowmaking has been selected as the treatment option. No credit is taken in this analysis for reduced dissolution that will occur as a result of the underground dewatering (Section 6.4 above for analysis of this case).

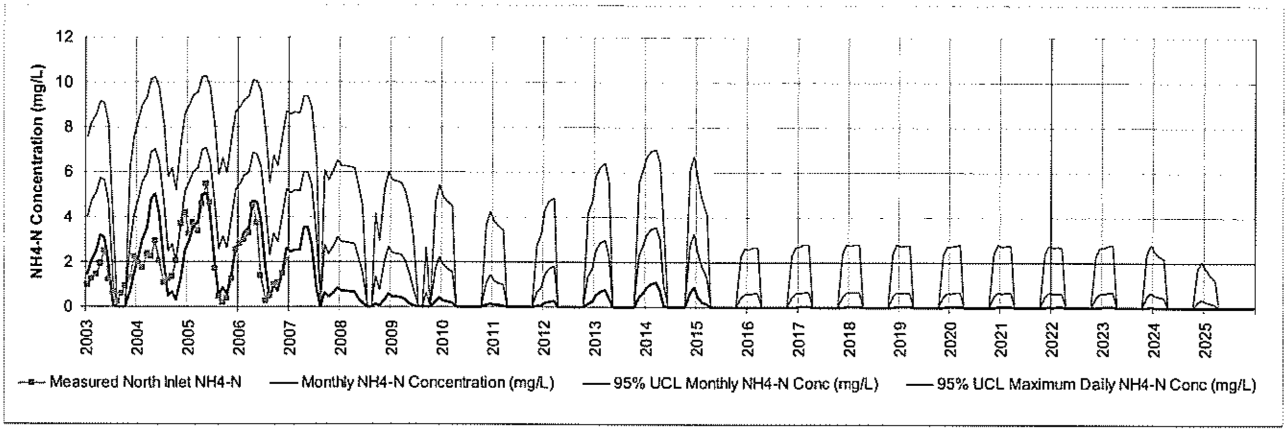
6.8.2 Practicality

Drainage of surface mines by removal of water from the underground workings is feasible and practical at Diavik, at least for the A154 and A418 Surface Mines. Snowmaking for relatively low quantities of water is considered a practical treatment option. The WLWB Panel therefore considers this strategy to be practical (see Section 3.3.6).

6.8.3 Results

The results of the simulation are presented Figure 6-3, which shows monthly ammonia concentration of water discharged to Lac de Gras.

Figure 6-8: Ammonia - Temporal Segregation



The ammonia concentrations obtained from the analysis are presented in Table 6-9:

Table 6-9 - Ammonia - Temporal Segregation

Time Period		2003-2006	2007	2008-2025
Average	mg/L	2.3	1.7	0.1
Maximum 30 Day	mg/L	5.1	3.5	1.1
Maximum 1 Day	mg/L	8.6	7.0	3.7
Maximum 95% UCL 30 Day	mg/L	7.1	6.0	3.5
Maximum 95% UCL 1 Day	mg/L	10.3	9.4	7.0

These results represent an approximate 61% decrease in maximum 30 day ammonia concentration over the base case.

The analysis indicates that there will be approximately 5,000 m^3/d that will be required to be disposed by snowmaking, which is practical (see Section 4.3.3 above).

6.9 Lowest Practical Ammonia Discharge

6.9.1 Method

The lowest practical ammonia discharge implements a number of the above ammonia control strategies together. The strategies considered are:

1. Blasting: Improved blasting practices with lining of the wettest holes in the worst ground.
2. Water Management: A418 Surface Mining dewatering water sent to PKC circuit.
3. Treatment: Enhanced natural biological treatment of ammonia in North Inlet.

With respect to the addition of the treatment element, it is noted that the predicted ammonia concentration at discharge is the same provided the current level of natural biological treatment of ammonia is at least maintained. However, the increased volume of water in the North Inlet, and the proposed testing of floating cattail mats will ensure that essentially all ammonia in the North Inlet is destroyed biologically in the summer months; this combined with the larger storage capacity of the North Inlet enhances the security of the overall ammonia control strategy.

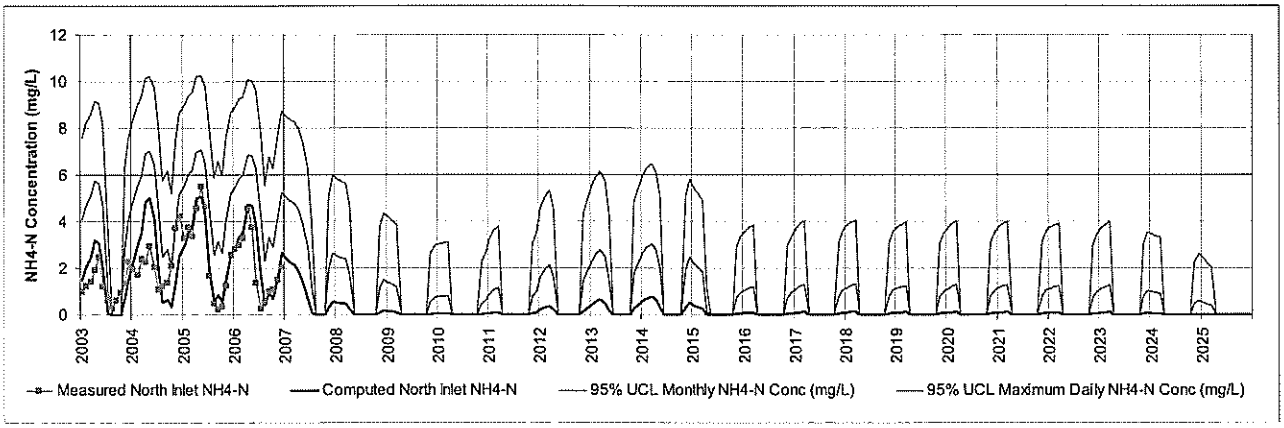
6.9.2 Practicality

Each of the strategies utilized in the Lowest Practical Ammonia Discharge case have been determined to be practical. The combination is also practical.

6.9.3 Results

The results of the simulation are presented Figure 6-9, which shows monthly ammonia concentration of water discharged to Lac de Gras.

Figure 6-9: Ammonia - Lowest Practical



The ammonia concentrations obtained from the analysis are presented in Table 6-10:

Table 6-10 - Ammonia - Lowest Practical

Time Period		2003-2006	2007	2008-2025
Average	mg/L	2.3	1.0	0.1
Maximum 30 Day	mg/L	5.1	2.4	0.8
Maximum 1 Day	mg/L	8.6	5.7	3.1
Maximum 95% UCL 30 Day	mg/L	7.1	5.1	3.0
Maximum 95% UCL 1 Day	mg/L	10.3	8.5	6.5

These results represent an approximate 73% decrease in maximum 30 day ammonia discharge over the base case.

6.10 Lowest Practical Ammonia Discharge with High Inflow to A418 Surface Mine

6.10.1 Method

It is predicted that there will be low inflow to the A418 Surface Mine (Golder, 2006a). If there turns out to be high inflow to the A418 Surface Mine, this will make the diversion of the dewatering water from this mine to the PKC circuit unfeasible, changing the lowest practical ammonia discharge.

The lowest practical ammonia discharge in the event that high inflow occurs in the A418 Surface Mine is obtained by applying the following ammonia control strategies:

1. Blasting: Improved blasting practices with lining of wet holes.
2. Water Management: Dewatering of surface mines by underground drainage.
3. Treatment: Enhanced natural biological treatment of ammonia in North Inlet.

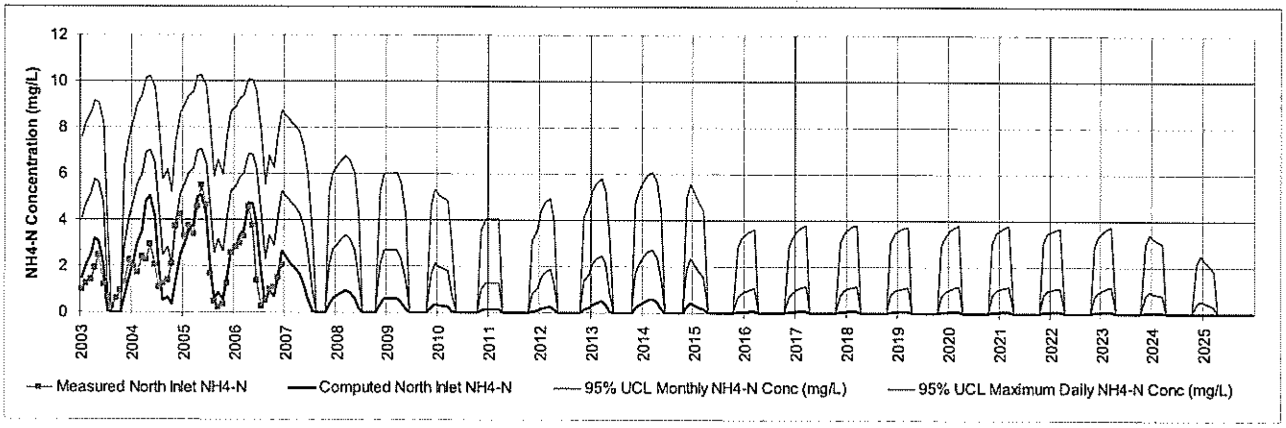
6.10.2 Practicality

Each of the strategies utilized in the Lowest Practical Ammonia Discharge case have been determined to be practical. The combination is also practical.

6.10.3 Results

The results of the simulation are presented Figure 6-9, which shows monthly ammonia concentration of water discharged to Lac de Gras.

Figure 6-10: Ammonia - Lowest Practical/High Inflow



The ammonia concentrations obtained from the analysis are presented in Table 6-11:

Table 6-11 - Ammonia - Lowest Practical/High Inflow

Time Period		**2003-2006**	**2007**	**2008-2025**
Average	mg/L	2.3	0.9	0.1
Maximum 30 Day	mg/L	5.1	2.3	0.9
Maximum 1 Day	mg/L	8.6	5.6	3.4
Maximum 95% UCL 30 Day	mg/L	7.1	5.0	3.3
Maximum 95% UCL 1 Day	mg/L	10.3	8.5	6.8

These results represent an approximate 67% decrease in maximum 30 day ammonia discharge over the base case.

6.11 Summary of Ammonia Mitigation Measures

The summary of the ammonia mitigation measures is presented in Table 6-12.

Table 6-12 - Summary of Ammonia Mitigation Measures

Case	**Blasting**	**AN Use**	**Inflow**	**Dewatering**	**Treatment**	**Max 30 Day**	**Max 1 Day**	**Max 95% UCL 30 Day**	**Max 95% UCL 1 Day**
Base	65% emulsion	ADP	ADP	All to NI	NI Loss	2.9	6.2	5.5	8.9
Improve Blasting	Combo#1	ADP	ADP	All to NI	NI Loss	1.5	4.3	4.1	7.6
Improve Blasting/Liner	Combo#2	ADP	ADP	All to NI	NI Loss	1.0	3.6	3.4	6.9
A418	65% emulsion	ADP	ADP	A418>PKC	NI Loss	1.1	3.8	3.6	7.1
UG-Drain	65% emulsion	ADP	ADP	Underground	NI Loss	1.1	3.8	3.6	7.1
Expand NI	65% emulsion	ADP	ADP	All to NI	NI Loss	2.5	5.7	5.1	8.6
Enhanced ND	65% emulsion	ADP	ADP	All to NI	NI Enhanced	2.0	5.2	4.7	8.2
Temporal Segregation	65% emulsion	ADP	ADP	UG-Segregated	NI Loss, Snow	1.1	3.7	3.5	7.0
Lowest Practical	Combo#2	ADP	ADP	A418>PKC	NI Enhanced	0.8	3.1	3.0	6.5
Lowest with High Flow	Combo#2	ADP	High A418	Underground	NI Enhanced	0.9	3.4	3.3	6.8

Note: "ADP" indicates values in the Ammonia Discussion Paper (DDMI, 2006a)

7. RECOMMENDED LOWEST PRACTICAL AMMONIA EFFLUENT QUALITY CRITERIA

Based on the above evaluation, the WLWB Review Panel concludes that the lowest practical ammonia Effluent Quality Criteria at the Diavik Diamond Mine are as follows:

For calendar year 2007, the lowest practical ammonia concentrations are the upper 95% confidence limits of the Lowest Practical Ammonia Discharge case (Section 6.9, Table 6-10):

Calendar year 2007:

- Monthly Maximum Discharge EQC..........................5.1 mg/L ammonia as nitrogen
- Daily Maximum Discharge EQC...............................8.5 mg/L ammonia as nitrogen

For the remainder of the project, the lowest practical ammonia concentrations are the upper 95% confidence limits of the Lowest Practical Ammonia Discharge with High Flow case (Section 6.10, Table 6-11):

Calendar year 2008 through the end of the project:

- Monthly Maximum Discharge EQC..........................3.3 mg/L ammonia as nitrogen
- Daily Maximum Discharge EQC...............................6.8 mg/L ammonia as nitrogen

These EQC represent ammonia levels that can be met by adoption of the ammonia management measures identified in this report. The EQC have been set such that there is in excess of a 95% probability that the peak monthly ammonia concentration and the peak daily concentration experienced in the entire project will meet the EQC[5].

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[5] Put another way, if 20 Diavik projects were operated with the ammonia controls proposed in this report (and in the draft AMP - see Section 8) in only one of them would there be an exceedence of the Ammonia EQC in a single month or on a single day.

8. COMPLIANCE OF THE AMMONIA MANAGEMENT PLAN WITH WLWB EFFLUENT QUALITY CRITERIA

8.1 Ammonia Management Plan

Part H, Section 23 of Water License N7L2-1645, under which Diavik operates, states that: (WLWB, 2004)

"The Licensee shall submit an Ammonia Management Plan for managing pit water inflows and ammonia, to the Board for approval by February 28, 2006. The Ammonia Management Plan shall be based on the results of all investigations, the aquatic ecology report, special effects studies, toxicity tests, water quality study, and any directions from the Board and shall include:

a) recommended measures for managing pit water inflows and ammonia; and
b) recommended effluent quality criteria for the period from September 1, 2006, onwards."

Consistent with the requirements of the License, DDMI has prepared an Ammonia Management Plan (AMP) for the Diavik Mine, a draft of which was submitted to WLWB on October 4, 2006 (DDMI, 2006c). The AMP includes by reference the "*Report on AN Loss Mechanism Investigation*" (Golder, 2006b), which was submitted to WLWB in December 2006, which contains recommendations on explosives management and use for ammonia management at Diavik.

8.2 Recommended Measures for Managing Pit Water Inflows and Ammonia

The recommended practical measures for managing pit water inflows and ammonia contained in the AMP are as follows:

1. <u>Explosive Management and Use.</u> Blasting modifications to control the source of ammonia in the mines that were recommended for Diavik were:
    a) <u>EM-1: Double Priming.</u> Location of boosters near the toe and at the mid-point of the explosive column was recommended to increase the probability of full detonation.

    b) <u>EM-2: Improved Loading.</u> Improved loading practices were recommended to reduce occlusions of water or silt in the explosive columns, enhancing detonation reliability.

    c) <u>EM-3: Limit solubility.</u> A emulsion explosive with 80% emulsion and 20% ANFO was recommended (and was adopted for use in the surface mines at Diavik on September 20, 2006).

    d) <u>EM-4: Thicker Emulsion.</u> A thicker emulsion was recommended to reduce the loss of emulsion explosive into fissures in the formation and to lessen solubility.

    e) <u>EM-6: Reduce Explosives Residence Time.</u> Residence time of emulsion explosive in wet holes was recommended to be reduced; WLWB considers a maximum of 2 days to be consistent with acceptable ammonia management goals.

    f) <u>EM-9: PE Liner in Wet Holes.</u> DDMI recognizes that ammonia loss in the wettest holes can only be reasonably minimized by the use of polyethylene (PE) liners (described as PVC liners in the report) for the explosive charge. WLWB recognizes as a recommendation the use of liners in blastholes that cannot be dewatered.

g) EM-13: Improve Stemming. Improved stemming procedures are recommended to prevent mixing of emulsion explosive and stemming material and thereby reduce undetonated ammonium nitrate residue.

2. A418 Pit Water as Make-up to Process Plant. The AMP recommends that the limited amount of inflow that is expected to report to the A418 Surface Mine should be discharged, with its ammonia charge, to the PKC system, thereby preventing the contained ammonia from entering the North Inlet system, and being discharged to Lac de Gras.
3. Rock Wall Seepage Collection. The AMP recommends independent collection of water from the walls of surface mines to reduce the amount of water on the mine benches, and thus reduce the dissolution of ammonium nitrate in the blast holes.
4. Treatment within the North Inlet. The AMP recommends (or at least recommends evaluation of) the following treatment options within the North Inlet:
    a. Cattail Mats. Deployment of cattail mats are expected to remove ammonia by conversion to nitrate, and uptake by the mat biomass.
    b. Natural Degradation. Natural degradation is currently occurring, and the recommended evaluation would show that this can be enhanced by increased pond size and by aeration.
    c. Increased Retention Time. Increasing the size of the North Inlet pool is recommended in order to increase the routing and mixing of ammonia within the Inlet.
5. A418 Pool Water for Dilution. The water that must be removed from inside the containment dike around the A418 surface mine will dilute the ammonia concentration in the North Inlet, and is recommended as an ammonia mitigation strategy.

8.3 Effect of AMP Recommended Ammonia Mitigation Methods

The WLWB Panel has evaluated the effects of adopting the AMP recommended ammonia mitigation methods, which collectively are included in the "Lowest Practical Ammonia Discharge" case, presented in Section 6.8 above. This evaluation concludes that the successful and immediate adoption of the recommended measures will result in the ammonia concentration in the discharge to Lac de Gras from the North Inlet being less than the Effluent Quality Criteria set forth in Section 7 above.

Accordingly, the WLWB Panel finds that the recommended measures for managing pit water inflows and ammonia contained in the draft ADP and referenced documents if successfully and immediately adopted will result in the Diavik Project meeting the lowest practical ammonia concentrations in discharge to Lac de Gras, which are embodied in the Ammonium Effluent Quality Criteria established in this report.

9. REVISIONS TO THE AMMONIA MANAGEMENT PLAN

The WLWB Panel has reviewed the draft AMP in detail. The review comprised the following elements, which are presented with the outcome of the reviews. Revision of the draft AMP consistent with the recommendations contained below will produce an AMP that meets the requirements of Water License N7L2-1645.

9.1 Ammonia Management Plan Objective

The WLWB Panel considers that this section should be the first section of the AMP, not Chapter 8 as in the draft.

The WLWB Panel does not concur with the description of the AMP objectives as stated in the current section of this title. The WLWB ruled that the objective of the Ammonia Management Plan is to identify and achieve the lowest practical ammonia concentration in discharges to Lac de Gras (Record of Agreement, MVLWB, 2004a). The description of the objective should be changed to reflect this agreement.

9.2 Ammonia and the Environment

The WLWB Panel recommends that the current section on Ammonia and the Environment be removed from the AMP, as it is irrelevant to this plan.

9.3 Ammonia Management Options

The review of the ammonia management options of the AMP is contained in the following sections of this review report:

The WLWB Panel recommends that DDMI revises the AMP to include consideration of the review comments on the specific options considered.

9.4 Recommended Effluent Criteria

The WLWB Panel recommends that the WLWB require the current evaluation of recommended effluent criteria (described as Effluent Quality Criteria in Water License N7L2-1645) be revised to accommodate the following changes:

1. Revision of the factors used to convert North Inlet average monthly concentrations of ammonia to estimated peak monthly concentrations to more accurately reflect actual experience in the period 2003-2006, and avoid unreasonable inflation of the 30-day EQC for ammonia.
2. Revision of the factors used to convert North Inlet average monthly concentrations of ammonia to estimated peak daily concentrations to more accurately reflect actual experience in the period 2003-2006, and avoid unreasonable inflation of the daily EQC for ammonia.

Accomplishing these revisions will bring the DDMI EQC into approximate agreement with the WLWB Panel EQC determinations presented above (Section 7).

9.5 Ammonia Management Implementation

The WLWB Panel recommends that the WLWB require that the Ammonia Management Implementation section describe the specific actions that will be undertaken at Diavik to achieve the required ammonia EQC. Each ammonia management action should be described generally in the body of the AMP, and supported by appended Draft Construction Documents and/or Standard Operating Procedures (as appropriate to the action) with sufficient specificity to allow and commit implementation by DDMI, and allow review and oversight of the actions by the WLWB.

9.6 Monitoring, Controls and Contingencies

The WLWB Panel recommends that the WLWB require that the specific monitoring to which DDMI commits for ammonia management be described in this section. The description should be in sufficient detail to allow WLWB to determine that the program is adequate for both DDMI and WLWB oversight and control of ammonia management.

The WLWB Panel recommends that that the WLWB require that the contingency plans include DDMI's absolute commitment that no discharge to Lac de Gras will occur in excess of the ammonia EQC.

9.7 Review, Reporting, Corrective Action

The WLWB Panel recommends that the WLWB requires that the AMP specifically include and state the reporting mechanisms (vehicle, trigger, frequency) for ammonia management, rather than including them by reference. These should include routine reporting, and should also include emergency/exceedence reporting to WLWB when ammonia levels in the discharge to Lac de Gras exceed trigger levels. The WLWB Panel recommends that the trigger level be set no higher than 90% of monthly and daily ammonia EQC.

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Attachment 1:
WLWB Ammonia Model

Wek'èezhìi Land & Water Board
Ammonia Prediction Model

Prepared for:

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Listof**Tables**

ListofFigures

1. INTRODUCTION

The WLWB Ammonia Prediction Model has been prepared to determine the lowest practical concentration of ammonia in discharge to Lac de Gras from the Diavik project. This model is used to derive the results that are reported in "Diavik Diamond Mine Ammonia Management Plan Review Panel Report", prepared by the Wek'èezhìi Land and Water Board Ammonia Management Plan Expert Panel: Terry Matts, Ph.D., Adrian Brown, P.Eng., and David Komen, Ph.D., dated January 20, 2007.

2. METHOD

The WLWB model simulates the non-production portion of the water management system at Diavik. This system collects water containing ammonia from the mining areas, discharges the combined flow into the North Inlet, and then passes North Inlet water through the (phosphate and TSS) Water Treatment Plant to discharge in Lac de Gras.

The water management system that contributes to the discharge into Lac de Gras is shown in Figure 1. The principal components of the system that are considered in the ammonia model are as follows:

1. A154 Surface Mine. This mine uses ammonium nitrate based blasting agents, and has inflow from groundwater that mobilizes the ammonium nitrate residue to the water management system.
2. A418 Surface Mine. This mine is currently being prepared for development by construction of a levee around the mine area and pumping lake water to the North Inlet for sediment removal and discharge. Subsequently, the mine will be developed using ammonium nitrate blasting and dewatering. Point of discharge of the dewatering is not yet decided.
3. A154/A418 Underground Mine. This mine complex is being developed to exploit the lower portions of the A154 and A418 kimberlite pipes from underground. Ammonium nitrate based explosives will be predominantly used in this complex. Water inflow to these mines will rapidly dewater the surface mines from above, and the (large) total flow will be directed to the North Inlet.
4. A21 Surface Mine. The A21 kimberlite is currently being evaluated by underground exploration. If developed, extraction will be by surface mining, followed by underground extraction. The water from this mine will be directed either to the North Inlet system, or to the Processed Kimberlite Containment (PKC) system, from which there is normally no discharge to Lac de Gras.

The model operates by considering the mass flux of ammonia through the North Inlet on a monthly basis. It computes:

1. The ammonia discharged to the North Inlet by these components;
2. The amount of ammonia lost during residence in Lac de Gras; and
3. The concentration of ammonia in the North Inlet at the end of the month (by dividing the total ammonia in the North Inlet into the total water volume in the North Inlet).

4. The amount of ammonia lost by discharge through the WTP to Lac de Gras.
5. The total ammonia left in the North Inlet at the end of the month (by subtracting the ammonia lost by discharge from the inventory of ammonia in the lake prior to discharge).

3. PARAMETERS

The parameters used in the base-case analysis are as set forth in Table 1.

4. CALIBRATION

4.1 Calibration Parameters

The model has been calibrated against the performance of the water management system for the period 2003 through 2006. The calibration is used to develop three parameters that fit the ammonia concentration at discharge to the ammonia used in mining. These parameters, and the values that achieved the best calibration of the model, are described below

4.1.1 Ammonia Loss Rate

This annual parameter is computed from the relationship between the actual ammonium nitrate used in blasting to the ammonia that is discharged from the mining system. The loss rate has been computed for the last four years, and is presented in Table 2. The loss rate has increased over the life of the A154 Surface Mine, and is currently standing at an annual average loss rate of 2.3% of ammonium nitrate used in blasting. This value has not been significantly reduced by recent variation in emulsion/ANFO mixture from 65/35 to 80/20, suggesting that the loss rate is not strongly dependent on blasting agent solubility. The increase in loss rate has been related to the water inflow to the mine, as shown in Table 2. The loss rate relationship with flow is used for all surface mines, based on years since initiation of mining.

4.1.2 Ammonia Rate Factor

This parameter is developed to produce the observed significant variability in ammonia loss from month to month. The causes for the variability from month to month are not well known, but they do occur. The monthly Ammonia Rate Factor that best reproduces the variability of the discharged ammonia concentration is presented in Table 3, using data collected from the A154 Surface Mine. The predicted concentration of NH4-N for mine water pumped from A154 is shown on Figure 2. Note that the rate factor has been selected to produce the magnitude of the variations observed in ammonia discharge, not necessarily the month of the year in which they have occurred historically. The variability is matched very well over the four years of record.

4.1.3 North Inlet Ammonia Destruction

This parameter is computed from the observed behavior of the system to date to reflect the monthly amount of ammonia that is destroyed (likely converted to nitrate and possibly nitrogen) in the North Inlet. The ammonia destruction is presented in Table 4, and represents the average of the ammonia destruction computed by subtracting the ammonia input to the lake from the change in ammonia inventory in the lake on a monthly basis. A one month time lag is observed between ammonia input at the west end of the inlet, and ammonia concentration change at the lake discharge at the east end of the inlet, and this is accommodated by lagging the comparison by one month. The ammonia destruction is strongly temporal, approaching zero in the winter when the North Inlet is ice-covered, and over 2 tons ammonia as nitrogen per month in summer, when the lake is (presumably) warmer and more agitated and oxygenated.

4.2 Calibration Achieved

The best calibration achieved using the above parameters obtained the paired dataset between observed and modeled monthly averaged ammonia concentration of water discharged to Lac de Gras for the period 2003-2006 is presented in Table 5.

The relationship between the actual and the modeled average monthly ammonia at discharge from the North Inlet to Lac de Gras is presented in Figure 3.

The parameters associated with the calibration based on 48 monthly averages are as follows:

Mean Difference (Measured - Computed).................-0.24 mg/L
Root Mean Squared Error of the Difference.............1.02 mg/L

5. MAXIMUM MONTHLY AND DAILY ESTIMATES

The Ammonia Model computes best monthly estimates for the parameters entered. In order to obtain results for the probable maximum monthly and daily concentrations, it is necessary to develop a relationship between average monthly and peak monthly concentrations, and peak monthly and peak daily concentrations.

5.1 Peak Monthly Concentrations

5.1.1 Objective

To determine the relationship between the measured monthly ammonia discharge from the NIWTP, and the modeled monthly mean discharge.

5.1.2 Method

The peak monthly ammonia concentrations were computed by the following method:

1. Compute the average ammonia concentration for each month from 2003 to 2006 using the model.
2. Then plot the measured ammonia concentration versus the computed concentration.
3. Develop a statistic for the relationship between the computed and actual concentration.
4. Plot the envelope of the maximum computed monthly values of ammonia versus the measured values.

5.1.3 Results

The measured and computed ammonia values are in Table 5.

The plot of measured and computed monthly average ammonia values are in Figure 3. This plot shows that the model does a good job of fitting the measured ammonia concentrations.

The plot of computed versus measured ammonia concentrations at discharge is presented as Figure 4. The upper envelope containing all the monthly data is approximately equivalent to the 95% upper confidence interval, in virtue of the fact that there are 48 datapoints which are all at lower values than the curve.

The resulting equation of the bounding curve is:

$$A_m(\max) = 3.4\ A_m^{0.45}$$

where: A_m = monthly average computed NH4-N concentration.

The confidence interval for the bounding curve is computed as follows:

Number of Samples	48
Number exceeding	<1
Confidence interval	>98%

5.2 Peak Daily Concentrations

5.2.1 Objective

To determine the relationship between the monthly average concentration of ammonia and the peak daily concentration of ammonia in the North Inlet discharge.

5.2.2 Method

The relationship between the peak daily concentration and the average monthly concentration was determined by reference to the observed data for the period 2002-2006. In this period, data are available for ammonia concentrations on a daily basis. The following steps were taken to determine the relationship between monthly average ammonia and daily maximum ammonia:

1. The monthly average ammonia concentrations were computed for all months from all daily data from 2003 through 2006.
2. The maximum daily discharge for each month was plotted against the average monthly concentration.
3. An envelope curve was developed that encloses all the maxima.

5.2.3 Results

The equation for the maximum daily ammonia concentration derived from the envelope curve is:

$$A_d(\max) = 3.4\ A_m^{0.567}$$

where: $A_d(\max)$ = Maximum daily NH4-N concentration in NIWTP discharge

A_m = Average monthly NH4-N concentration in NIWTP discharge

This curve is also constructed from 48 points, so that the statistics of the relationship are:

Number of points	48
Number exceeding	<1
Confidence interval	>98%

Table 1 - Basic Parameters used in Model

	SURFACE MINE A154						SURFACE MINE A418						U/G MINES A418/A154						SURFACE MINE A21						ANNUAL MODEL			
Date	Flow rate	Ammonium Nitrate	AN Dissolution Rate	AN Dissolved	NH4-N Dissolved	NH4-N Conc	Flow rate	Ammonium Nitrate	AN Dissolution Rate	AN Dissolved	NH4-N Dissolved	NH4-N Conc	Flow rate	Ammonium Nitrate	AN Dissolution Rate	AN Dissolved	NH4-N Dissolved	NH4-N Conc	Flow rate	Ammonium Nitrate	AN Dissolution Rate	AN Dissolved	NH4-N Dissolved	NH4-N Conc	AN Used (tonne)	NH4-N Total (tonne)	Flow through NI (MMm3)	Average NH4-N Conc (mg/L
	m3/d	t/y	%	t/y	t/y	mg/L	m3/d	t/y	%	t/y	t/y	mg/L	m3/d	t/y	%	t/y	t/y	mg/L	m3/d	t/y	%	t/y	t/y	mg/L				
2003	7700	10400	0.92%	96	17	6.1	0	0	0.00%	0	0	0.0	0	0	0.00%	0	0	0.0	0	0	0.00%	0	0	0.0	10400	17.0	2.8	6.06
2004	10500	9700	1.60%	155	27	7.2	0	0	0.00%	0	0	0.0	0	0	0.00%	0	0	0.0	0	0	0.00%	0	0	0.0	9700	27.5	3.8	7.17
2005	14100	8700	1.98%	172	31	5.9	0	0	0.00%	0	0	0.0	0	0	0.00%	0	0	0.0	0	0	0.00%	0	0	0.0	8700	30.5	5.1	5.93
2006	15700	7700	2.26%	174	31	5.4	250	0	0.00%	0	0	0.0	4100	548	2.94%	16	3	1.9	0	0	0.00%	0	0	0.0	8248	33.6	7.3	4.60
2007	17200	4900	2.79%	137	24	3.9	500	4800	0.92%	44	8	43.0	8200	390	2.94%	11	2	0.7	0	0	0.00%	0	0	0.0	10090	34.1	9.5	3.61
2008	8950	1080	2.79%	30	5	1.6	500	9700	1.60%	155	27	150.4	24600	340	2.94%	10	2	0.2	0	0	0.00%	0	0	0.0	11120	34.6	12.4	2.78
2009	700	0	0.00%	0	0	0.0	500	7200	1.98%	143	25	138.3	40900	210	2.94%	6	1	0.1	0	0	0.00%	0	0	0.0	7410	26.3	15.4	1.71
2010	700	0	0.00%	0	0	0.0	500	2200	2.26%	50	9	48.2	39200	131	2.94%	4	1	0.0	0	0	0.00%	0	0	0.0	2331	9.5	14.7	0.64
2011	700	0	0.00%	0	0	0.0	500	280	2.79%	8	1	7.6	37400	390	2.94%	11	2	0.1	0	0	0.00%	0	0	0.0	670	3.4	14.1	0.24
2012	700	0	0.00%	0	0	0.0	500	14	2.79%	0	0	0.4	37350	360	2.94%	11	2	0.1	2100	2280	0.92%	21	4	4.9	2654	5.7	14.8	0.38
2013	700	0	0.00%	0	0	0.0	500	0	0.00%	0	0	0.0	37300	200	2.94%	6	1	0.1	4500	4510	1.60%	72	13	7.8	4710	13.8	15.7	0.88
2014	700	0	0.00%	0	0	0.0	500	0	0.00%	0	0	0.0	38950	250	2.94%	7	1	0.1	7200	5610	1.98%	111	20	7.5	5860	21.0	17.3	1.21
2015	700	0	0.00%	0	0	0.0	500	0	0.00%	0	0	0.0	40600	340	2.94%	10	2	0.1	0	0	0.00%	0	0	0.0	340	1.8	15.3	0.12
2016	700	0	0.00%	0	0	0.0	500	0	0.00%	0	0	0.0	40000	370	2.94%	11	2	0.1	0	0	0.00%	0	0	0.0	370	1.9	15.0	0.13
2017	700	0	0.00%	0	0	0.0	500	0	0.00%	0	0	0.0	39500	450	2.94%	13	2	0.2	0	0	0.00%	0	0	0.0	450	2.3	14.9	0.16
2018	700	0	0.00%	0	0	0.0	500	0	0.00%	0	0	0.0	39000	440	2.94%	13	2	0.2	0	0	0.00%	0	0	0.0	440	2.3	14.7	0.16
2019	700	0	0.00%	0	0	0.0	500	0	0.00%	0	0	0.0	38500	390	2.94%	11	2	0.1	0	0	0.00%	0	0	0.0	390	2.0	14.5	0.14
2020	700	0	0.00%	0	0	0.0	500	0	0.00%	0	0	0.0	42600	460	2.94%	14	2	0.2	0	0	0.00%	0	0	0.0	460	2.4	16.0	0.15
2021	700	0	0.00%	0	0	0.0	500	0	0.00%	0	0	0.0	46800	480	2.94%	14	3	0.1	0	0	0.00%	0	0	0.0	480	2.5	17.5	0.14
2022	700	0	0.00%	0	0	0.0	500	0	0.00%	0	0	0.0	42200	380	2.94%	11	2	0.1	0	0	0.00%	0	0	0.0	380	2.0	15.8	0.12
2023	700	0	0.00%	0	0	0.0	500	0	0.00%	0	0	0.0	37700	420	2.94%	12	2	0.2	0	0	0.00%	0	0	0.0	420	2.2	14.2	0.15
2024	700	0	0.00%	0	0	0.0	500	0	0.00%	0	0	0.0	38300	120	2.94%	4	1	0.0	0	0	0.00%	0	0	0.0	120	0.6	14.4	0.04
2025	700	0	0.00%	0	0	0.0	500	0	0.00%	0	0	0.0	38900	0	2.94%	0	0	0.0	0	0	0.00%	0	0	0.0	0	0.0	14.6	0.00

Table 2 - Ammonia Loss Rate - Historical

YEAR	Mine Flow	NH4-N	AN Loss	AN Used	AN loss
	m3/d	mg/L	tonne	tonne	%
2003	7109	6.6	96	10400	0.9%
2004	10507	7.0	155	9700	1.6%
2005	14089	6.0	172	8700	2.0%
2006	17644	4.8	174	7700	2.3%

Table 3 - Ammonia Rate Factor (%)

Month	Ammonia Rate Factor (%)
Jan	60%
Feb	75%
Mar	70%
Apr	175%
May	170%
Jun	150%
Jul	40%
Aug	60%
Sep	150%
Oct	75%
Nov	75%
Dec	100%

Table 4 - North Inlet Ammonia Destruction Rate

Month	North Inlet NH4-N Destruction (tons)
Jan	0.0
Feb	0.0
Mar	0.0
Apr	1.0
May	2.0
Jun	3.0
Jul	3.0
Aug	3.0
Sep	3.0
Oct	2.0
Nov	0.0
Dec	0.0
Year	**17.0**

Table 5 - WLWB Ammonia Model Calibration

Month	**Actual ammonia concentration (mg/L)**	**Modeled Ammonia Concentration (mg/L)**	**Actual - Modeled Concentration (mg/L)**	**(Actual Conc - Modeled Conc)^2 (mg^2/L^2)**	**Envelope Ammonia Concentration (mg/L)**
Jan-03	**1.0**	1.49	-0.51	0.26	3.370
Feb-03	**1.3**	2.05	-0.80	0.65	3.760
Mar-03	**1.4**	2.49	-1.09	1.18	3.960
Apr-03	**1.9**	3.19	-1.27	1.62	4.558
May-03	**2.5**	3.07	-0.60	0.36	5.109
Jun-03	**1.2**	2.02	-0.83	0.69	3.670
Jul-03	**0.6**	0.06	0.56	0.32	2.752
Aug-03	**0.2**	0.00	0.24	0.06	1.786
Sep-03	**0.6**	0.00	0.58	0.33	2.653
Oct-03	**0.9**	0.00	0.94	0.89	3.309
Nov-03	**1.3**	0.70	0.60	0.36	3.828
Dec-03	**2.2**	1.53	0.71	0.51	4.886
Jan-04	**2.0**	2.17	-0.19	0.04	4.620
Feb-04	**1.7**	2.97	-1.25	1.57	4.336
Mar-04	**2.4**	3.50	-1.13	1.28	5.009
Apr-04	**2.2**	4.81	-2.57	6.62	4.886
May-04	**2.9**	5.01	-2.08	4.32	5.518
Jun-04	**2.0**	4.12	-2.09	4.36	4.678
Jul-04	**1.1**	1.93	-0.88	0.77	3.478
Aug-04	**1.2**	0.49	0.73	0.53	3.724
Sep-04	**1.3**	0.65	0.70	0.49	3.891
Oct-04	**2.1**	0.33	1.74	3.02	4.711
Nov-04	**3.7**	1.33	2.35	5.52	6.114
Dec-04	**4.2**	2.52	1.68	2.81	6.483
Jan-05	**3.3**	2.95	0.31	0.10	5.788
Feb-05	**3.7**	3.51	0.23	0.05	6.155
Mar-05	**3.4**	3.80	-0.44	0.19	5.866
Apr-05	**4.6**	4.97	-0.41	0.16	6.734
May-05	**5.5**	5.08	0.40	0.16	7.313

Month	**Actual ammonia concentration (mg/L)**	**Modeled Ammonia Concentration (mg/L)**	**Actual - Modeled Concentration (mg/L)**	**(Actual Conc - Modeled Conc)^2 (mg^2/L^2)**	**Envelope Ammonia Concentration (mg/L)**
Jun-05	**4.6**	4.20	0.43	0.18	6.773
Jul-05	**1.7**	1.90	-0.24	0.06	4.282
Aug-05	**0.5**	0.53	-0.07	0.00	2.412
Sep-05	**0.2**	0.86	-0.66	0.44	1.629
Oct-05	**0.3**	0.57	-0.23	0.05	2.085
Nov-05	**1.2**	1.51	-0.28	0.08	3.731
Dec-05	**2.6**	2.60	-0.05	0.00	5.183
Jan-06	**2.8**	2.85	-0.03	0.00	5.423
Feb-06	**3.0**	3.30	-0.33	0.11	5.546
Mar-06	**3.3**	3.51	-0.25	0.06	5.794
Apr-06	**4.6**	4.72	-0.17	0.03	6.725
May-06	**3.7**	4.69	-0.96	0.92	6.145
Jun-06	**1.4**	3.89	-2.52	6.37	3.914
Jul-06	**0.2**	1.66	-1.41	2.00	1.812
Aug-06	**0.5**	0.42	0.08	0.01	2.482
Sep-06	**1.0**	0.94	0.03	0.00	3.353
Oct-06	**1.1**	0.69	0.36	0.13	3.476
Nov-06	**1.5**	1.58	-0.11	0.01	4.053
Dec-06	**2.1**	2.62	-0.57	0.32	4.704
Average	2.05	2.29	-0.24	1.04	
Variance	1.79	2.42	1.01	2.86	
RMS Error				1.02	

Figure 1: Diavik Water Management System

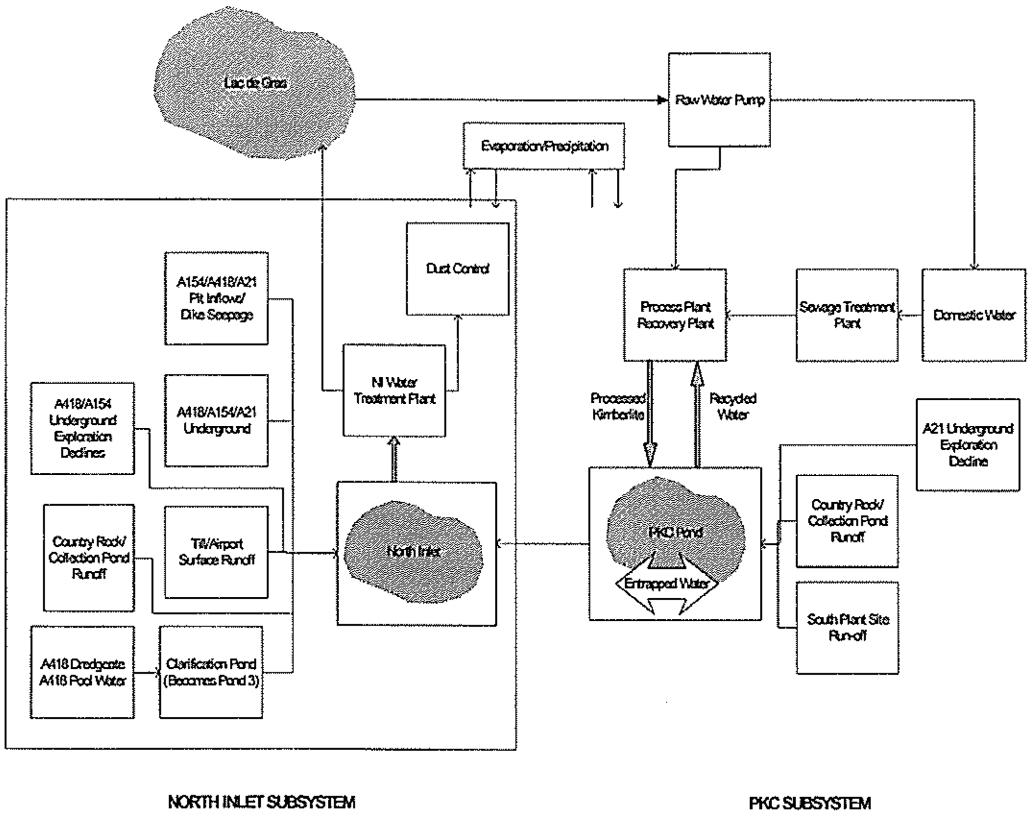


Figure 2 - Calibration of A154 Ammonia Rate Factor

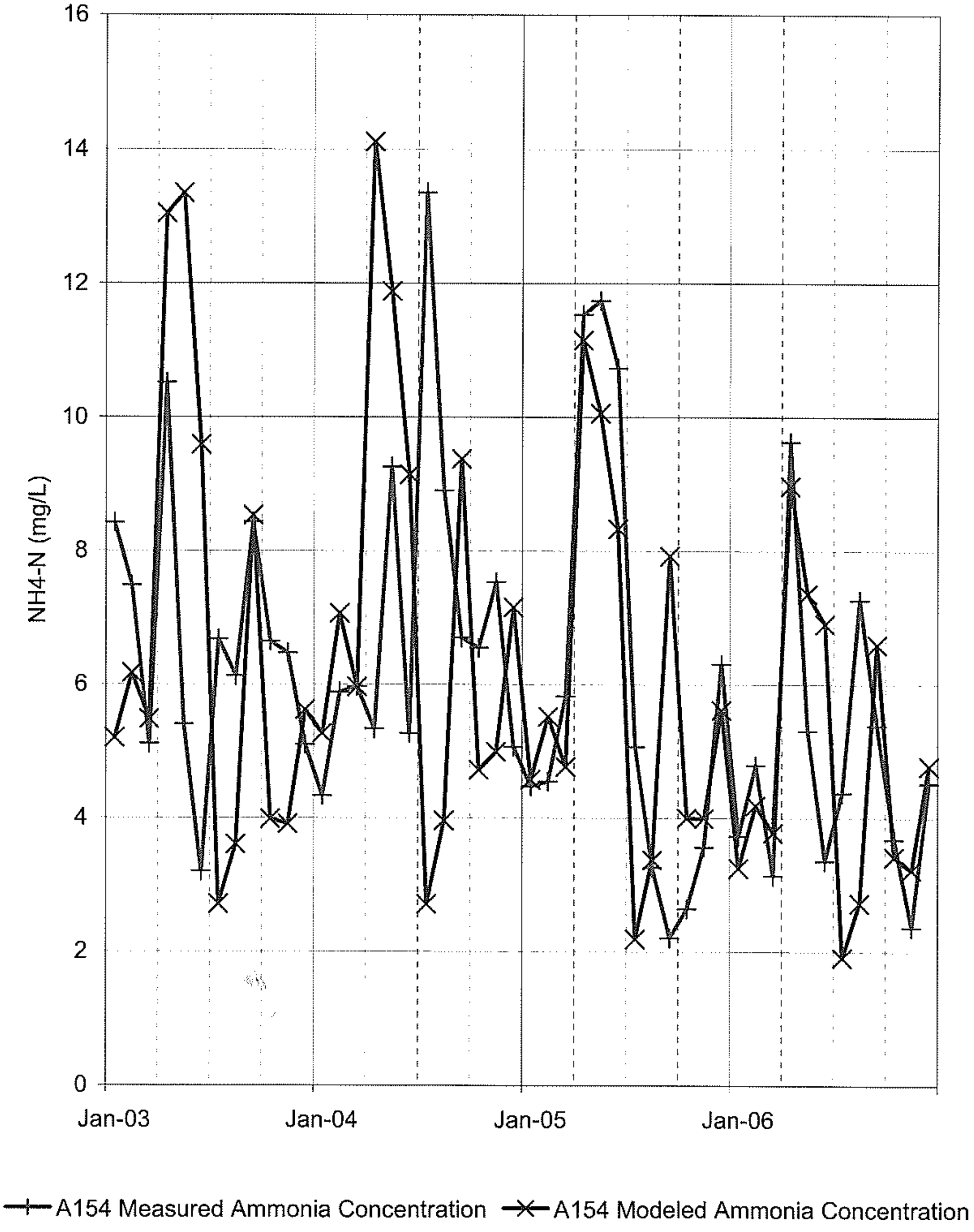


Figure 3 - Calibration of North Inlet Discharge

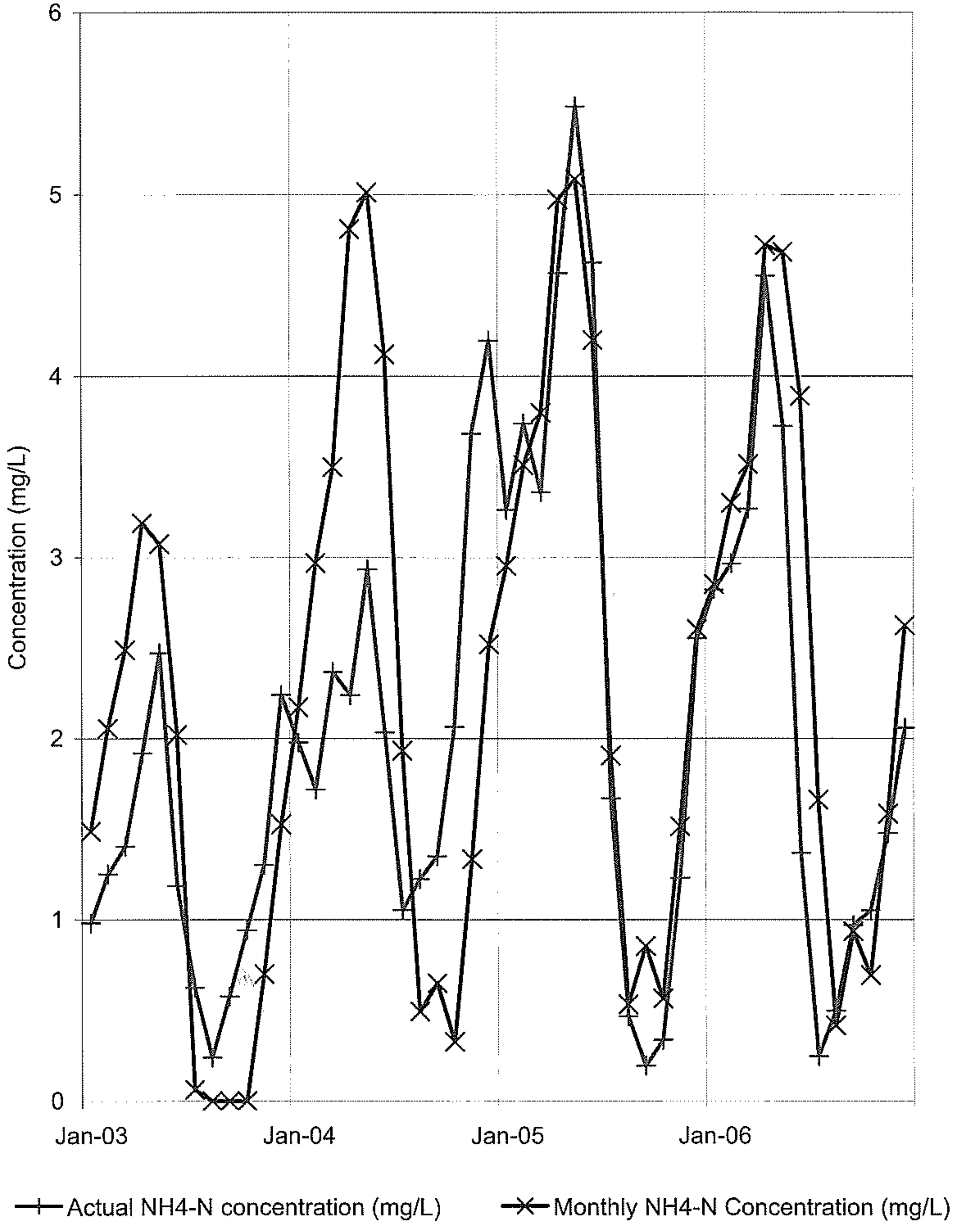


Figure 4 - Peak Monthly Ammonia Evaluation

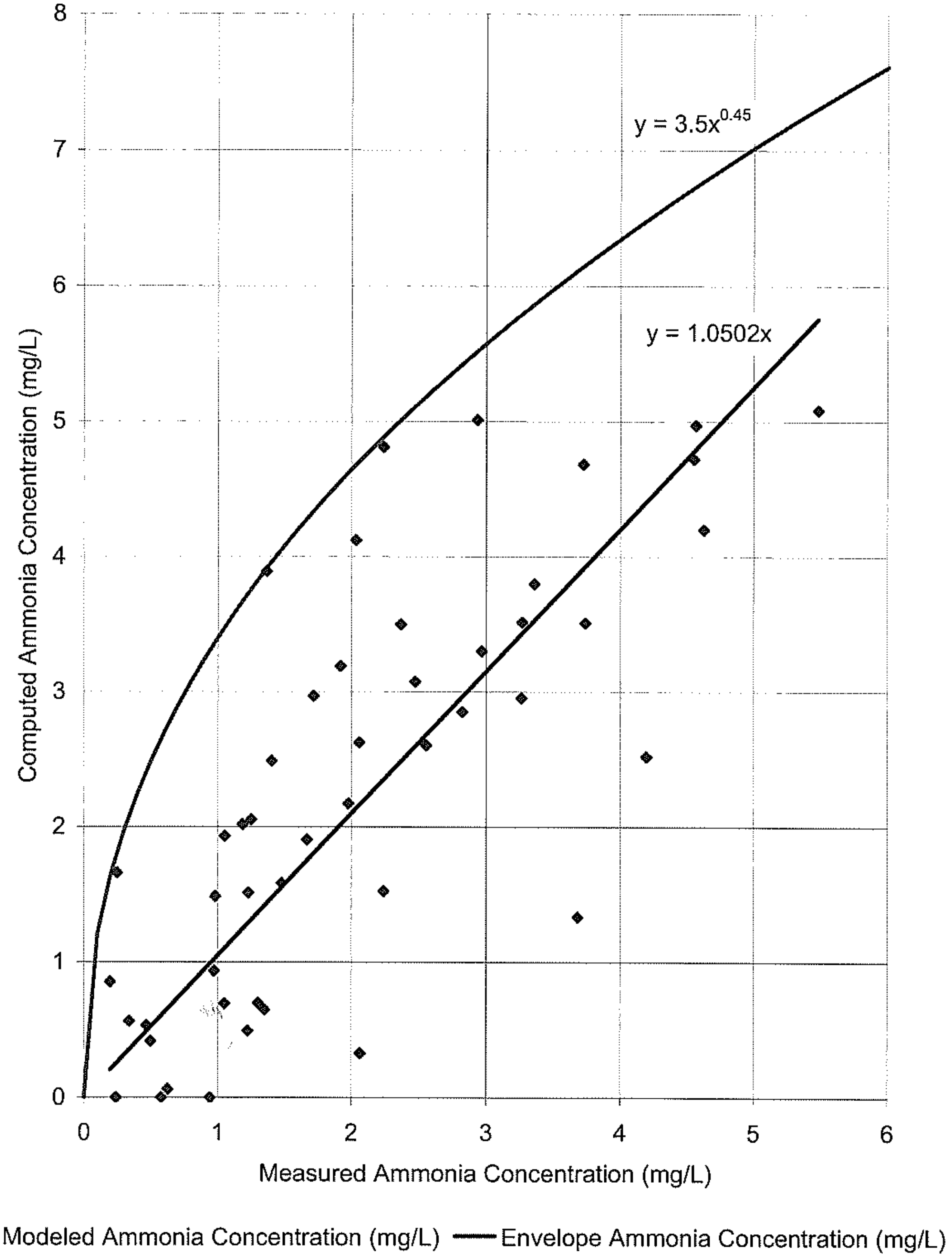
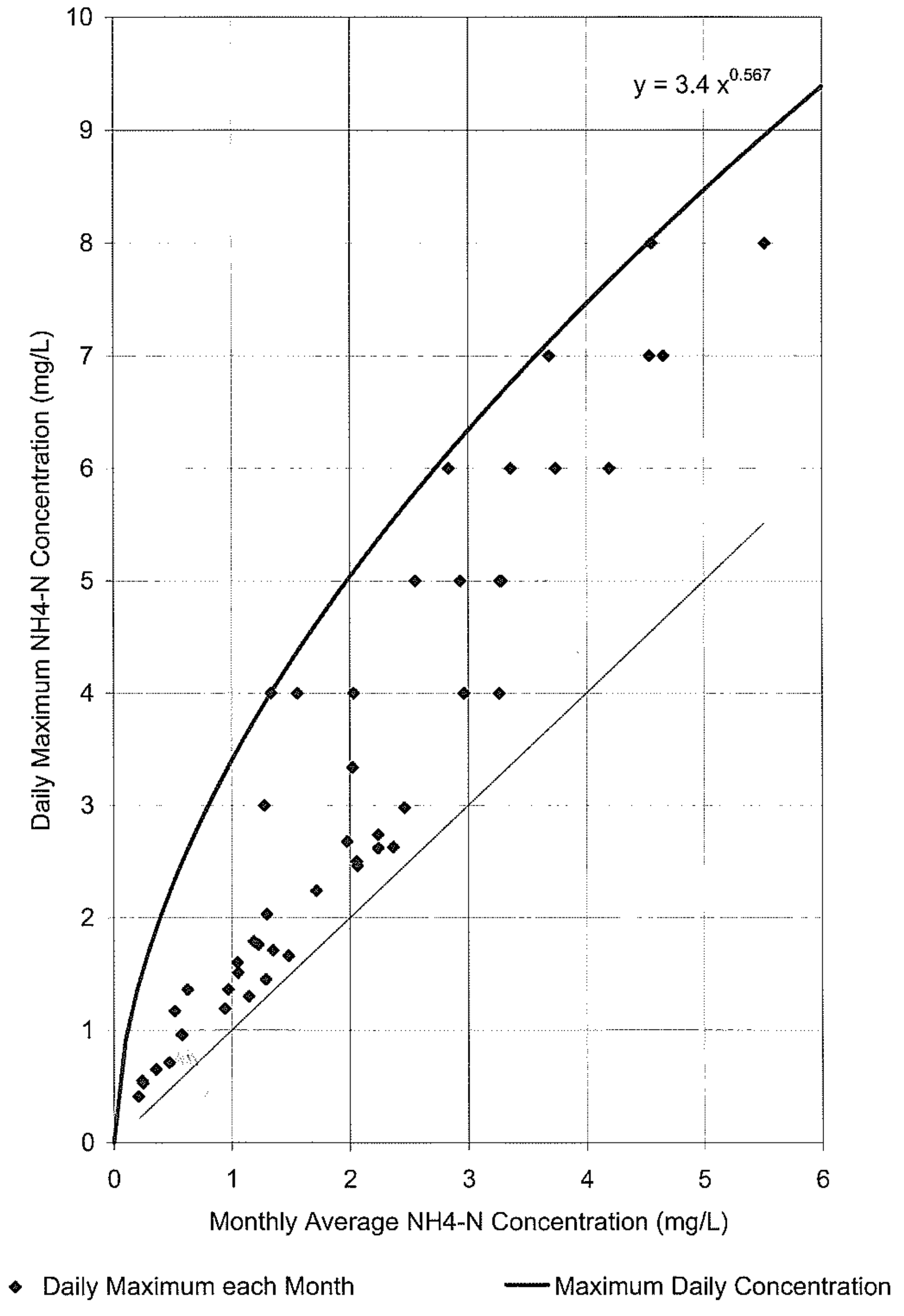


Figure 5 - Daily Maxima vs Monthly Average Ammonia

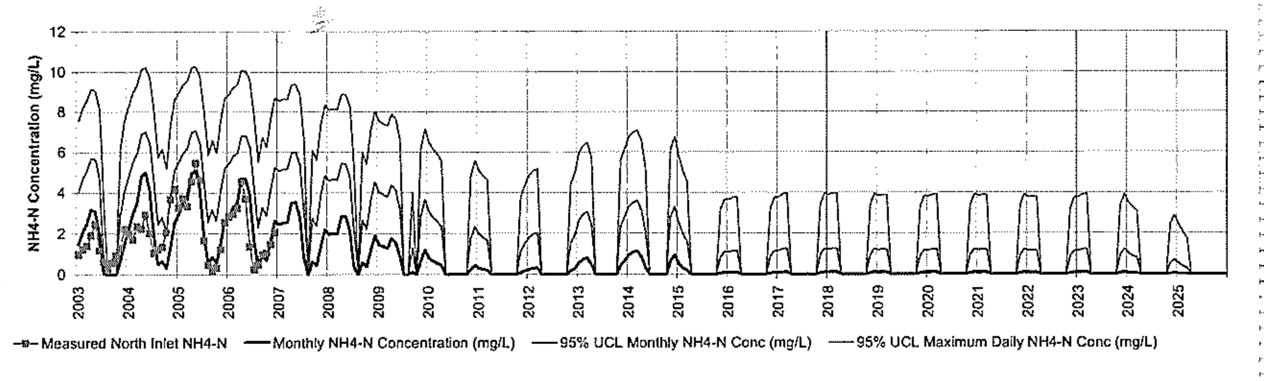


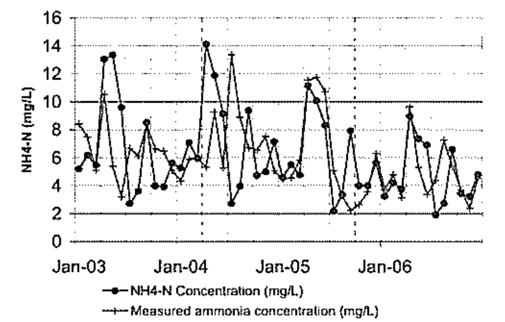
Attachment 2:

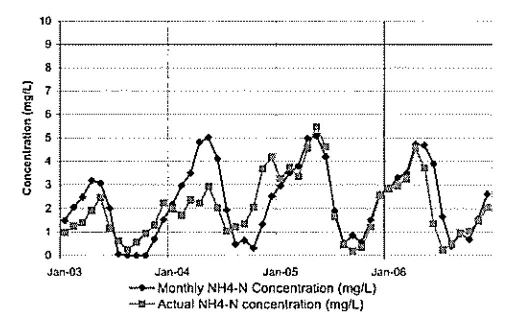
WLWB Ammonia Model Simulation Results

WLWB Ammonia Model - Base Case

WLWB AMMONIA MANAGEMENT MODEL OF DIAVIK PROJECT:				
CASE:	**Base Case**			
BLASTING:	Current practices: open hole; 80/20 emulsion/ANFO mix; no liner; wet holes pumped and double primed; large area blasts			
AN USE:	Past and future use as per Diavik ADP projections (SNC-Lavalin, Ammonia Balance, May 2006)			
MINE INFLOW:	Actual to present, predicted inflows (Golder, 2006) in future.			
WATER MANAGEMENT:	All mine water discharged to North Inlet			
TREATMENT:	No additional treatment; natural biological degradation in North Inlet to continue at current rate.			
FLOW TO LAC DE GRAS:	Actual to present, future discharge equal to input in same month.			
RESULTS	**FROM BEGINNING OF**	**03**	**07**	**08**
AMMONIA (N) TO LDG	**TO END OF**	**06**	**07**	**25**
	Average	2.3	1.9	0.2
	Maximum 30 Day	5.1	3.5	2.9
	Maximum 1 Day	8.6	7.0	6.2
	Maximum 95% UCL 30 Day	7.1	6.0	5.5
	Maximum 95% UCL 1 Day	10.3	9.4	8.9







WLWB Ammonia Model - Base Case

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Jan-03	5,380	867	0.924%	60%	4.80	0.85	5.2	8.4	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	5380	1.41	32000	17,905	1.00	1.25	0.85	0.0	2.1	1.5	0.81	1.29	1.49	4.35	4.06	7.57	1.0
Feb-03	5,667	867	0.924%	75%	6.00	1.06	6.2	7.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	5667	1.42	32000	17,175	1.49	1.86	1.06	0.0	2.9	2.1	1.07	1.85	2.05	5.20	4.70	8.20	1.3
Mar-03	5,954	867	0.924%	70%	5.60	0.99	5.5	5.1	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	5954	1.43	32000	16,854	2.05	2.57	0.99	0.0	3.6	2.5	1.28	2.29	2.49	5.78	5.12	8.60	1.4
Apr-03	6,251	867	0.924%	175%	14.01	2.48	13.0	10.5	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	1.25	6251	1.44	32000	16,875	2.49	3.11	2.48	1.0	4.6	3.2	1.64	2.96	3.19	6.62	5.73	9.14	1.9
May-03	5,936	867	0.924%	170%	13.61	2.41	13.3	5.4	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	1.25	5936	1.43	32000	25,514	3.19	3.99	2.41	2.0	4.4	3.1	2.39	2.01	3.07	6.49	5.64	9.06	2.5
Jun-03	7,290	867	0.924%	150%	12.01	2.13	9.6	3.2	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	7290	1.47	32000	29,485	3.07	3.84	2.13	3.0	3.0	2.0	1.81	1.16	2.02	5.15	4.66	8.16	1.2
Jul-03	6,867	867	0.924%	40%	3.20	0.57	2.7	6.7	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	6867	1.46	32000	28,379	2.02	2.52	0.57	3.0	0.1	0.1	0.05	0.04	0.06	0.76	0.98	3.45	0.6
Aug-03	7,753	867	0.924%	60%	4.80	0.85	3.6	6.1	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	7753	1.49	32000	27,138	0.06	0.08	0.85	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.2
Sep-03	8,194	867	0.924%	150%	12.01	2.13	8.5	8.4	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	8194	1.50	32000	29,865	0.00	0.00	2.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.6
Oct-03	8,775	867	0.924%	75%	6.00	1.06	4.0	6.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	8775	1.52	32000	27,977	0.00	0.00	1.06	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.9
Nov-03	8,935	867	0.924%	75%	6.00	1.06	3.9	6.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	8935	1.52	32000	15,411	0.00	0.00	1.06	0.0	1.1	0.7	0.33	0.74	0.70	2.87	2.89	6.28	1.3
Dec-03	8,301	867	0.924%	100%	8.01	1.42	5.6	5.1	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	8301	1.50	32000	24,385	0.70	0.87	1.42	0.0	2.3	1.5	1.13	1.16	1.53	4.42	4.11	7.62	2.2
Jan-04	8,570	808	1.598%	60%	7.75	1.37	5.3	4.3	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	8570	1.51	32000	13,372	1.53	1.91	1.37	0.0	3.3	2.2	0.88	2.40	2.17	5.36	4.82	8.31	2.0
Feb-04	7,982	808	1.598%	75%	9.69	1.72	7.1	5.9	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	7982	1.49	32000	7,407	2.17	2.71	1.72	0.0	4.4	3.0	0.67	3.76	2.97	6.37	5.55	8.98	1.7
Mar-04	8,828	808	1.598%	70%	9.04	1.60	6.0	6.0	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	8828	1.52	32000	3,826	2.97	3.71	1.60	0.0	5.3	3.5	0.41	4.91	3.50	6.97	5.97	9.35	2.4
Apr-04	9,324	808	1.598%	175%	22.60	4.00	14.1	5.3	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	1.25	9324	1.53	32000	0	3.50	4.37	4.00	1.0	7.4	4.8	0.00	7.38	4.81	8.30	6.89	10.12	2.2
May-04	10,755	808	1.598%	170%	21.95	3.89	11.9	9.3	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	1.25	10755	1.58	32000	0	4.81	6.01	3.89	2.0	7.9	5.0	0.00	7.90	5.01	8.49	7.02	10.22	2.9
Jun-04	12,337	808	1.598%	150%	19.37	3.43	9.1	5.3	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	12337	1.63	32000	16,027	5.01	6.26	3.43	3.0	6.7	4.1	2.01	4.69	4.12	7.63	6.43	9.74	2.0
Jul-04	11,098	808	1.598%	40%	5.17	0.92	2.7	13.4	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	11098	1.59	32000	25,310	4.12	5.15	0.92	3.0	3.1	1.9	1.49	1.58	1.93	5.03	4.57	8.07	1.1
Aug-04	11,394	808	1.598%	60%	7.75	1.37	4.0	8.9	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	11394	1.60	32000	28,658	1.93	2.41	1.37	3.0	0.8	0.5	0.43	0.36	0.49	2.37	2.47	5.76	1.2
Sep-04	12,030	808	1.598%	150%	19.37	3.43	9.4	6.7	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	12030	1.62	32000	27,577	0.49	0.62	3.43	3.0	1.0	0.6	0.54	0.50	0.65	2.76	2.80	6.17	1.3
Oct-04	11,948	808	1.598%	75%	9.69	1.72	4.7	6.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11948	1.61	32000	13,563	0.65	0.81	1.72	2.0	0.5	0.3	0.14	0.39	0.33	1.89	2.06	5.20	2.1
Nov-04	11,300	808	1.598%	75%	9.69	1.72	5.0	7.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11300	1.59	32000	12,590	0.33	0.41	1.72	0.0	2.1	1.3	0.51	1.61	1.33	4.10	3.87	7.37	3.7
Dec-04	10,514	808	1.598%	100%	12.91	2.29	7.2	5.1	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	10514	1.57	32000	11,561	1.33	1.67	2.29	0.0	4.0	2.5	0.89	3.07	2.52	5.82	5.15	8.62	4.2
Jan-05	10,958	725	1.979%	60%	8.61	1.53	4.6	4.5	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	10958	1.58	32000	10,692	2.52	3.15	1.53	0.0	4.7	3.0	0.96	3.72	2.95	6.35	5.53	8.97	3.3
Feb-05	11,359	725	1.979%	75%	10.76	1.91	5.5	4.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11359	1.60	32000	12,385	2.95	3.69	1.91	0.0	5.6	3.5	1.32	4.28	3.51	6.98	5.98	9.36	3.7
Mar-05	12,270	725	1.979%	70%	10.04	1.78	4.8	5.8	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	12270	1.62	32000	12,748	3.51	4.39	1.78	0.0	6.2	3.8	1.47	4.69	3.80	7.29	6.20	9.55	3.4
Apr-05	13,110	725	1.979%	175%	25.11	4.45	11.2	11.5	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	1.25	13110	1.65	32000	13,667	3.80	4.75	4.45	1.0	8.2	5.0	2.07	6.13	4.97	8.46	7.00	10.20	4.6
May-05	14,120	725	1.979%	170%	24.39	4.32	10.1	11.7	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	1.25	14120	1.68	32000	16,000	4.97	6.22	4.32	2.0	8.5	5.1	2.47	6.06	5.08	8.56	7.07	10.26	5.5
Jun-05	15,045	725	1.979%	150%	21.52	3.81	8.3	10.7	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	15045	1.71	32000	17,531	5.08	6.35	3.81	3.0	7.2	4.2	2.24	4.93	4.20	7.70	6.48	9.79	4.6
Jul-05	15,261	725	1.979%	40%	5.74	1.02	2.2	5.1	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	15261	1.71	32000	8,477	4.20	5.25	1.02	3.0	3.3	1.9	0.49	2.77	1.90	4.99	4.54	8.05	1.7
Aug-05	14,863	725	1.979%	60%	8.61	1.53	3.4	3.3	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	14863	1.70	32000	17,738	1.90	2.38	1.53	3.0	0.9	0.5	0.29	0.62	0.53	2.48	2.56	5.87	0.5
Sep-05	15,820	725	1.979%	150%	21.52	3.81	7.9	2.2	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	15820	1.73	32000	24,395	0.53	0.67	3.81	3.0	1.5	0.9	0.63	0.85	0.86	3.21	3.17	6.60	0.2
Oct-05	15,681	725	1.979%	75%	10.76	1.91	4.0	2.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15681	1.73	32000	21,915	0.86	1.07	1.91	2.0	1.0	0.6	0.38	0.60	0.57	2.56	2.63	5.96	0.3
Nov-05	15,693	725	1.979%	75%	10.76	1.91	4.0	3.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15693	1.73	32000	17,253	0.57	0.71	1.91	0.0	2.6	1.5	0.79	1.82	1.51	4.40	4.10	7.60	1.2
Dec-05	14,884	725	1.979%	100%	14.35	2.54	5.6	6.3	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	14884	1.70	32000	14,961	1.51	1.89	2.54	0.0	4.4	2.6	1.19	3.25	2.60	5.92	5.23	8.69	2.6
Jan-06	15,584	642	2.256%	60%	8.69	1.54	3.2	3.7	250	0	0.000%	60%	0.00	0.00	0.0	0	46	2.94%	60%	0.81	0.14	#DIV/0!	0	0	0.00%	60%	0.00	0.00	0.0	1.25	15834	1.73	32000	15,041	2.60	3.26	1.68	0.0	4.9	2.9	1.30	3.63	2.85	6.23	5.45	8.89	2.8
Feb-06	15,104	642	2.256%	75%	10.86	1.92	4.2	4.8	250	0	0.000%	75%	0.00	0.00	0.0	0	46	2.94%	75%	1.01	0.18	#DIV/0!	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15354	1.72	32000	15,114	2.85	3.56	2.10	0.0	5.7	3.3	1.52	4.15	3.30	6.75	5.82	9.22	3.0
Mar-06	15,618	642	2.256%	70%	10.14	1.80	3.8	3.1	250	0	0.000%	70%	0.00	0.00	0.0	0	46	2.94%	70%	0.94	0.17	#DIV/0!	0	0	0.00%	70%	0.00	0.00	0.0	1.25	15868	1.73	32000	19,356	3.30	4.13	1.96	0.0	6.1	3.5	2.07	4.02	3.51	6.99	5.99	9.36	3.3
Apr-06	16,453	642	2.256%	175%	25.34	4.49	9.0	9.6	250	0	0.000%	175%	0.00	0.00	0.0	0	46	2.94%	175%	2.35	0.42	#DIV/0!	0	0	0.00%	175%	0.00	0.00	0.0	1.25	16703	1.76	32000	17,439	3.51	4.39	4.91	1.0	8.3	4.7	2.50	5.80	4.72	8.22	6.84	10.07	4.6
May-06	19,475	642	2.256%	170%	24.61	4.36	7.4	5.3	250	0	0.000%	170%	0.00	0.00	0.0	0	46	2.94%	170%	2.28	0.40	#DIV/0!	0	0	0.00%	170%	0.00	0.00	0.0	1.25	19725	1.85	32000	20,203	4.72	5.90	4.77	2.0	8.7	4.7	2.88	5.79	4.69	8.18	6.81	10.06	3.7
Jun-06	18,310	642	2.256%	150%	21.72	3.85	6.9	3.4	250	0	0.000%	150%	0.00	0.00	0.0	22	46	2.94%	150%	2.01	0.36	531.3	0	0	0.00%	150%	0.00	0.00	0.0	1.25	18582	1.82	32000	27,717	4.69	5.86	4.21	3.0	7.1	3.9	3.28	3.78	3.89	7.39	6.27	9.60	1.4
Jul-06	17,677	642	2.256%	40%	5.79	1.03	1.9	4.4	250	0	0.000%	40%	0.00	0.00	0.0	40	46	2.94%	40%	0.54	0.10	77.3	0	0	0.00%	40%	0.00	0.00	0.0	1.25	17967	1.80	32000	22,154	3.89	4.86	1.12	3.0	3.0	1.7	1.12	1.87	1.66	4.63	4.27	7.78	0.2
Aug-06	18,560	642	2.256%	60%	8.69	1.54	2.7	7.3	250	0	0.000%	60%	0.00	0.00	0.0	38	46	2.94%	60%	0.81	0.14	122.6	0	0	0.00%	60%	0.00	0.00	0.0	1.25	18849	1.82	32000	18,801	1.66	2.08	1.68	3.0	0.8	0.4	0.24	0.52	0.42	2.16	2.29	5.52	0.5
Sep-06	19,176	642	2.256%	150%	21.72	3.85	6.6	5.4	250	0	0.000%	150%	0.00	0.00	0.0	154	46	2.94%	150%	2.01	0.36	76.1	0	0	0.00%	150%	0.00	0.00	0.0	1.25	19580	1.85	32000	25,748	0.42	0.52	4.21	3.0	1.7	0.9	0.73	0.99	0.94	3.37	3.30	6.75	1.0
Oct-06	18,487	642	2.256%	75%	10.86	1.92	3.4	3.7	250	0	0.000%	75%	0.00	0.00	0.0	430	46	2.94%	75%	1.01	0.18	13.6	0	0	0.00%	75%	0.00	0.00	0.0	1.25	19166	1.83	32000	26,010	0.94	1.17	2.10	2.0	1.3	0.7	0.55	0.72	0.69	2.86	2.88	6.27	1.1
Nov-06	19,635	642	2.256%	75%	10.86	1.92	3.2	2.4	250	0	0.000%	75%	0.00	0.00	0.0	687	46	2.94%	75%	1.01	0.18	8.5	0	0	0.00%	75%	0.00	0.00	0.0	1.25	20572	1.88	32000	23,981	0.69	0.87	2.10	0.0	3.0	1.6	1.16	1.82	1.58	4.51	4.18	7.69	1.5
Dec-06	17,652	642	2.256%	100%	14.48	2.57	4.8	4.5	250	0	0.000%	100%	0.00	0.00	0.0	929	46	2.94%	100%	1.34	0.24	8.4	0	0	0.00%	100%	0.00	0.00	0.0	1.25	18831	1.82	32000	19,976	1.58	1.98	2.80	0.0	4.8	2.6	1.59	3.19	2.62	5.95	5.25	8.71	2.1
Jan-07	17,200	408	2.794%	60%	6.64	1.21	2.3		500	400	0.924%	60%	2.22	0.39	25.8	8,200	33	2.94%	60%	0.57	0.10	0.4	0	0	0.00%	60%	0.00	0.00	0.0	1.25	25900	2.04	32000	25,900	2.62	3.28	1.71	0.0	5.0	2.4	1.93	3.06	2.45	5.73	5.09	8.56	
Feb-07	17,200	408	2.794%	75%	8.56	1.52	2.9		500	400	0.924%	75%	2.77	0.49	32.3	8,200	33	2.94%	75%	0.72	0.13	0.5	0	0	0.00%	75%	0.00	0.00	0.0	1.25	25900	2.04	32000	25,900	2.45	3.06	2.13	0.0	5.2	2.5	2.01	3.19	2.55	5.86	5.18	8.65	
Mar-07	17,200	408	2.794%	70%	7.99	1.42	2.7		500	400	0.924%	70%	2.59	0.46	30.1	8,200	33	2.94%	70%	0.67	0.12	0.5	0	0	0.00%	70%	0.00	0.00	0.0	1.25	25900	2.04	32000	25,900	2.55	3.19	1.99	0.0	5.2	2.5	2.00	3.18	2.54	5.85	5.17	8.64	
Apr-07	17,200	408	2.794%	175%	19.96	3.54	6.8		500	400	0.924%	175%	6.47	1.15	75.3	8,200	33	2.94%	175%	1.67	0.30	1.2	0	0	0.00%	175%	0.00	0.00	0.0	1.25	25900	2.04	32000	25,900	2.54	3.18	4.98	1.0	7.2	3.5	2.77	4.39	3.51	6.98	5.98	9.36	
May-07	17,200	408	2.794%	170%	19.39	3.44	6.6		500	400	0.924%	170%	6.28	1.11	73.1	8,200	33	2.94%	170%	1.62	0.29	1.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	25900	2.04	45000	25.900	3.51	4.39	4.84	2.0	7.2	3.5	2.79	4.43	3.55	7.02	6.01	9.39	

WLWB Ammonia Model - Base Case

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Logged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Jun-07	17,200	408	2.794%	150%	17.11	3.03	5.8		500	400	0.924%	150%	5.54	0.98	64.5	8,200	33	2.94%	150%	1.43	0.25	1.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	25900	2.04	45000	25,900	3.55	4.43	4.27	3.0	5.7	2.8	2.20	3.50	2.80	6.16	5.40	8.85	
Jul-07	17,200	408	2.794%	40%	4.56	0.81	1.5		500	400	0.924%	40%	1.48	0.26	17.2	8,200	33	2.94%	40%	0.38	0.07	0.3	0	0	0.00%	40%	0.00	0.00	0.0	1.25	25900	2.04	45000	25,900	2.80	3.50	1.14	3.0	1.6	0.8	0.63	1.00	0.80	3.10	3.08	6.50	
Aug-07	17,200	408	2.794%	60%	6.84	1.21	2.3		500	400	0.924%	60%	2.22	0.39	25.8	8,200	33	2.94%	60%	0.57	0.10	0.4	0	0	0.00%	60%	0.00	0.00	0.0	1.25	25900	2.04	45000	25,900	0.80	1.00	1.71	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-07	17,200	408	2.794%	150%	17.11	3.03	5.8		500	400	0.924%	150%	5.54	0.98	64.5	8,200	33	2.94%	150%	1.43	0.25	1.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	25900	2.04	45000	25,900	0.00	0.00	4.27	3.0	1.3	0.6	0.49	0.78	0.62	2.70	2.75	6.10	
Oct-07	17,200	408	2.794%	75%	8.56	1.52	2.9		500	400	0.924%	75%	2.77	0.49	32.3	8,200	33	2.94%	75%	0.72	0.13	0.5	0	0	0.00%	75%	0.00	0.00	0.0	1.25	25900	2.04	45000	25,900	0.62	0.78	2.13	2.0	0.9	0.4	0.35	0.56	0.45	2.25	2.37	5.62	
Nov-07	17,200	408	2.794%	75%	8.56	1.52	2.9		500	400	0.924%	75%	2.77	0.49	32.3	8,200	33	2.94%	75%	0.72	0.13	0.5	0	0	0.00%	75%	0.00	0.00	0.0	1.25	25900	2.04	45000	25,900	0.45	0.56	2.13	0.0	2.7	1.3	1.04	1.65	1.32	4.08	3.86	7.35	
Dec-07	17,200	408	2.794%	100%	11.41	2.02	3.9		500	400	0.924%	100%	3.69	0.65	43.0	8,200	33	2.94%	100%	0.96	0.17	0.7	0	0	0.00%	100%	0.00	0.00	0.0	1.25	25900	2.04	45000	25,900	1.32	1.65	2.85	0.0	4.5	2.2	1.74	2.76	2.21	5.41	4.86	8.35	
Jan-08	8,950	90	2.794%	60%	1.51	0.27	1.0		500	808	1.598%	60%	7.75	1.37	90.2	24,600	28	2.94%	60%	0.50	0.09	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	2.21	2.76	1.73	0.0	4.5	2.0	2.03	2.45	1.96	5.07	4.61	8.11	
Feb-08	8,950	90	2.794%	75%	1.89	0.33	1.2		500	808	1.598%	75%	9.69	1.72	112.8	24,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	1.96	2.45	2.16	0.0	4.6	2.0	2.09	2.52	2.02	5.15	4.66	8.16	
Mar-08	8,950	90	2.794%	70%	1.76	0.31	1.1		500	808	1.598%	70%	9.04	1.60	105.3	24,600	28	2.94%	70%	0.58	0.10	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	2.02	2.52	2.02	0.0	4.5	2.0	2.06	2.48	1.99	5.11	4.63	8.13	
Apr-08	8,950	90	2.794%	175%	4.40	0.78	2.9		500	808	1.598%	175%	22.60	4.00	263.2	24,600	28	2.94%	175%	1.46	0.26	0.3	0	0	0.00%	175%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	1.99	2.48	5.04	1.0	6.5	2.9	2.96	3.57	2.86	6.23	5.45	8.90	
May-08	8,950	90	2.794%	170%	4.27	0.76	2.8		500	808	1.598%	170%	21.95	3.89	255.6	24,600	28	2.94%	170%	1.42	0.25	0.3	0	0	0.00%	170%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	2.86	3.57	4.90	2.0	6.5	2.8	2.93	3.54	2.83	6.20	5.43	8.88	
Jun-08	8,950	90	2.794%	150%	3.77	0.67	2.5		500	808	1.598%	150%	19.37	3.43	225.6	24,600	28	2.94%	150%	1.25	0.22	0.3	0	0	0.00%	150%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	2.83	3.54	4.32	3.0	4.9	2.1	2.20	2.66	2.13	5.30	4.77	8.27	
Jul-08	8,950	90	2.794%	40%	1.01	0.18	0.7		500	808	1.598%	40%	5.17	0.92	60.2	24,600	28	2.94%	40%	0.33	0.06	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	2.13	2.66	1.15	3.0	0.8	0.4	0.37	0.44	0.35	1.98	2.13	5.31	
Aug-08	8,950	90	2.794%	60%	1.51	0.27	1.0		500	808	1.598%	60%	7.75	1.37	90.2	24,600	28	2.94%	60%	0.50	0.09	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	0.35	0.44	1.73	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-08	8,950	90	2.794%	150%	3.77	0.67	2.5		500	808	1.598%	150%	19.37	3.43	225.6	24,600	28	2.94%	150%	1.25	0.22	0.3	0	0	0.00%	150%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	0.00	0.00	4.32	3.0	1.3	0.6	0.60	0.72	0.58	2.59	2.66	5.99	
Oct-08	8,950	90	2.794%	75%	1.89	0.33	1.2		500	808	1.598%	75%	9.69	1.72	112.8	24,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	0.58	0.72	2.16	2.0	0.9	0.4	0.40	0.48	0.39	2.08	2.22	5.42	
Nov-08	8,950	90	2.794%	75%	1.89	0.33	1.2		500	808	1.598%	75%	9.69	1.72	112.8	24,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	0.39	0.48	2.16	0.0	2.6	1.2	1.20	1.45	1.16	3.79	3.63	7.11	
Dec-08	8,950	90	2.794%	100%	2.51	0.45	1.6		500	808	1.598%	100%	12.91	2.29	150.4	24,600	28	2.94%	100%	0.83	0.15	0.2	0	0	0.00%	100%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	1.16	1.45	2.88	0.0	4.3	1.9	1.96	2.37	1.89	4.97	4.53	8.04	
Jan-09	700	0	0.000%	60%	0.00	0.00	0.0		500	600	1.979%	60%	7.13	1.26	83.0	40,900	18	2.94%	60%	0.31	0.05	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	1.89	2.37	1.32	0.0	3.7	1.5	1.86	1.82	1.46	4.30	4.03	7.53	
Feb-09	700	0	0.000%	75%	0.00	0.00	0.0		500	600	1.979%	75%	8.91	1.58	103.7	40,900	18	2.94%	75%	0.39	0.07	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	1.46	1.82	1.65	0.0	3.5	1.4	1.75	1.71	1.37	4.16	3.92	7.42	
Mar-09	700	0	0.000%	70%	0.00	0.00	0.0		500	600	1.979%	70%	8.31	1.47	96.8	40,900	18	2.94%	70%	0.36	0.06	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	1.37	1.71	1.54	0.0	3.2	1.3	1.64	1.61	1.28	4.02	3.80	7.30	
Apr-09	700	0	0.000%	175%	0.00	0.00	0.0		500	600	1.979%	175%	20.78	3.68	242.0	40,900	18	2.94%	175%	0.90	0.16	0.1	0	0	0.00%	175%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	1.28	1.61	3.84	1.0	4.4	1.8	2.25	2.20	1.76	4.77	4.38	7.89	
May-09	700	0	0.000%	170%	0.00	0.00	0.0		500	600	1.979%	170%	20.19	3.58	235.1	40,900	18	2.94%	170%	0.87	0.16	0.1	0	0	0.00%	170%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	1.76	2.20	3.73	2.0	3.9	1.6	1.99	1.94	1.55	4.46	4.14	7.65	
Jun-09	700	0	0.000%	150%	0.00	0.00	0.0		500	600	1.979%	150%	17.81	3.16	207.4	40,900	18	2.94%	150%	0.77	0.14	0.1	0	0	0.00%	150%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	1.55	1.94	3.29	3.0	2.2	0.9	1.13	1.10	0.88	3.27	3.21	6.65	
Jul-09	700	0	0.000%	40%	0.00	0.00	0.0		500	600	1.979%	40%	4.75	0.84	55.3	40,900	18	2.94%	40%	0.21	0.04	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.88	1.10	0.88	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-09	700	0	0.000%	60%	0.00	0.00	0.0		500	600	1.979%	60%	7.13	1.26	83.0	40,900	18	2.94%	60%	0.31	0.05	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.00	0.00	1.32	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-09	700	0	0.000%	150%	0.00	0.00	0.0		500	600	1.979%	150%	17.81	3.16	207.4	40,900	18	2.94%	150%	0.77	0.14	0.1	0	0	0.00%	150%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.00	0.00	3.29	3.0	0.3	0.1	0.15	0.14	0.12	1.07	1.29	4.03	
Oct-09	700	0	0.000%	75%	0.00	0.00	0.0		500	600	1.979%	75%	8.91	1.58	103.7	40,900	18	2.94%	75%	0.39	0.07	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.12	0.14	1.65	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-09	700	0	0.000%	75%	0.00	0.00	0.0		500	600	1.979%	75%	8.91	1.58	103.7	40,900	18	2.94%	75%	0.39	0.07	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.00	0.00	1.65	0.0	1.6	0.7	0.83	0.81	0.65	2.76	2.80	6.17	
Dec-09	700	0	0.000%	100%	0.00	0.00	0.0		500	600	1.979%	100%	11.88	2.10	138.3	40,900	18	2.94%	100%	0.51	0.09	0.1	0	0	0.00%	100%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.65	0.81	2.20	0.0	3.0	1.2	1.52	1.49	1.19	3.85	3.69	7.16	
Jan-10	700	0	0.000%	60%	0.00	0.00	0.0		500	183	2.256%	60%	2.48	0.44	28.9	39,200	11	2.94%	60%	0.19	0.03	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	1.19	1.49	0.47	0.0	2.0	0.8	0.97	0.99	0.79	3.08	3.06	6.47	
Feb-10	700	0	0.000%	75%	0.00	0.00	0.0		500	183	2.256%	75%	3.10	0.55	36.1	39,200	11	2.94%	75%	0.24	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.79	0.99	0.59	0.0	1.6	0.6	0.78	0.80	0.64	2.73	2.78	6.14	
Mar-10	700	0	0.000%	70%	0.00	0.00	0.0		500	183	2.256%	70%	2.90	0.51	33.7	39,200	11	2.94%	70%	0.22	0.04	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.64	0.80	0.55	0.0	1.4	0.5	0.67	0.68	0.54	2.51	2.59	5.90	
Apr-10	700	0	0.000%	175%	0.00	0.00	0.0		500	183	2.256%	175%	7.24	1.28	84.3	39,200	11	2.94%	175%	0.56	0.10	0.1	0	0	0.00%	175%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.54	0.68	1.38	1.0	1.1	0.4	0.53	0.54	0.43	2.20	2.32	5.56	
May-10	700	0	0.000%	170%	0.00	0.00	0.0		500	183	2.256%	170%	7.03	1.25	81.9	39,200	11	2.94%	170%	0.55	0.10	0.1	0	0	0.00%	170%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.43	0.54	1.34	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-10	700	0	0.000%	150%	0.00	0.00	0.0		500	183	2.256%	150%	6.21	1.10	72.3	39,200	11	2.94%	150%	0.48	0.09	0.1	0	0	0.00%	150%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.00	0.00	1.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-10	700	0	0.000%	40%	0.00	0.00	0.0		500	183	2.256%	40%	1.65	0.29	19.3	39,200	11	2.94%	40%	0.13	0.02	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.00	0.00	0.32	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-10	700	0	0.000%	60%	0.00	0.00	0.0		500	183	2.256%	60%	2.48	0.44	28.9	39,200	11	2.94%	60%	0.19	0.03	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.00	0.00	0.47	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-10	700	0	0.000%	150%	0.00	0.00	0.0		500	183	2.256%	150%	6.21	1.10	72.3	39,200	11	2.94%	150%	0.48	0.09	0.1	0	0	0.00%	150%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.00	0.00	1.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-10	700	0	0.000%	75%	0.00	0.00	0.0		500	183	2.256%	75%	3.10	0.55	36.1	39,200	11	2.94%	75%	0.24	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.00	0.00	0.59	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-10	700	0	0.000%	75%	0.00	0.00	0.0		500	183	2.256%	75%	3.10	0.55	36.1	39,200	11	2.94%	75%	0.24	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.00	0.00	0.59	0.0	0.6	0.2	0.29	0.30	0.24	1.59	1.79	4.81	
Dec-10	700	0	0.000%	100%	0.00	0.00	0.0		500	183	2.256%	100%	4.14	0.73	48.2	39,200	11	2.94%	100%	0.32	0.06	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.24	0.30	0.79	0.0	1.1	0.4	0.54	0.55	0.44	2.23	2.35	5.60	
Jan-11	700	0	0.000%	60%	0.00	0.00	0.0		500	23	2.794%	60%	0.39	0.07	4.6	37,400	33	2.94%	60%	0.57	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.44	0.55	0.17	0.0	0.7	0.3	0.35	0.37	0.30	1.80	1.97	5.08	
Feb-11	700	0	0.000%	75%	0.00	0.00	0.0		500	23	2.794%	75%	0.49	0.09	5.7	37,400	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.30	0.37	0.21	0.0	0.6	0.2	0.28	0.30	0.24	1.60	1.79	4.83	
Mar-11	700	0	0.000%	70%	0.00	0.00	0.0		500	23	2.794%	70%	0.46	0.08	5.3	37,400	33	2.94%	70%	0.67	0.12	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.24	0.30	0.20	0.0	0.5	0.2	0.24	0.26	0.21	1.47	1.67	4.64	
Apr-11	700	0	0.000%	175%	0.00	0.00	0.0		500	23	2.794%	175%	1.14	0.20	13.3	37,400	33	2.94%	175%	1.67	0.30	0.3	0	0	0.00%	175%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.21	0.26	0.50	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-11	700	0	0.000%	170%	0.00	0.00	0.0		500	23	2.794%	170%	1.11	0.20	12.9	37,400	33	2.94%	170%	1.62	0.29	0.3	0	0	0.00%	170%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.48	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-11	700	0	0.000%	150%	0.00	0.00	0.0		500	23	2.794%	150%	0.98	0.17	11.4	37,400	33	2.94%	150%	1.43	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.43	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-11	700	0	0.000%	40%	0.00	0.00	0.0		500	23	2.794%	40%	0.26	0.05	3.0	37,400	33	2.94%	40%	0.38	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.11	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-11	700	0	0.000%	60%	0.00	0.00	0.0		500	23	2.794%	60%	0.39	0.07	4.6	37,400	33	2.94%	60%	0.57	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.17	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-11	700	0	0.000%	150%	0.00	0.00	0.0		500	23	2.794%	150%	0.98	0.17	11.4	37,400	33	2.94%	150%	1.43	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.43	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-11	700	0	0.000%	75%	0.00	0.00	0.0		500	23	2.794%	75%	0.49	0.09	5.7	37,400	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.21	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Base Case

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Nov-11	700	0	0.000%	75%	0.00	0.00	0.0		500	23	2.794%	75%	0.49	0.09	5.7	37,400	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.21	0.0	0.2	0.1	0.10	0.11	0.09	0.92	1.14	3.76	
Dec-11	700	0	0.000%	100%	0.00	0.00	0.0		500	23	2.794%	100%	0.65	0.12	7.6	37,400	33	2.94%	100%	0.96	0.17	0.1	0	0	0.00%	100%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.09	0.11	0.28	0.0	0.4	0.2	0.19	0.20	0.16	1.29	1.50	4.38	
Jan-12	700	0	0.000%	60%	0.00	0.00	0.0		500	1	2.794%	60%	0.02	0.00	0.2	37,350	30	2.94%	60%	0.53	0.09	0.1	2,100	190	0.92%	60%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.16	0.20	0.41	0.0	0.6	0.2	0.30	0.31	0.25	1.62	1.81	4.85	
Feb-12	700	0	0.000%	75%	0.00	0.00	0.0		500	1	2.794%	75%	0.02	0.00	0.3	37,350	30	2.94%	75%	0.66	0.12	0.1	2,100	190	0.92%	75%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.25	0.31	0.43	0.0	0.7	0.3	0.37	0.37	0.30	1.80	1.97	5.08	
Mar-12	700	0	0.000%	70%	0.00	0.00	0.0		500	1	2.794%	70%	0.02	0.00	0.3	37,350	30	2.94%	70%	0.62	0.11	0.1	2,100	190	0.92%	70%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.30	0.37	0.42	0.0	0.8	0.3	0.40	0.40	0.32	1.87	2.04	5.18	
Apr-12	700	0	0.000%	175%	0.00	0.00	0.0		500	1	2.794%	175%	0.06	0.01	0.7	37,350	30	2.94%	175%	1.54	0.27	0.2	2,100	190	0.92%	175%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.32	0.40	0.59	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-12	700	0	0.000%	170%	0.00	0.00	0.0		500	1	2.794%	170%	0.06	0.01	0.6	37,350	30	2.94%	170%	1.50	0.27	0.2	2,100	190	0.92%	170%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.00	0.00	0.59	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-12	700	0	0.000%	150%	0.00	0.00	0.0		500	1	2.794%	150%	0.05	0.01	0.6	37,350	30	2.94%	150%	1.32	0.23	0.2	2,100	190	0.92%	150%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.00	0.00	0.55	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-12	700	0	0.000%	40%	0.00	0.00	0.0		500	1	2.794%	40%	0.01	0.00	0.2	37,350	30	2.94%	40%	0.35	0.06	0.1	2,100	190	0.92%	40%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.00	0.00	0.38	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-12	700	0	0.000%	60%	0.00	0.00	0.0		500	1	2.794%	60%	0.02	0.00	0.2	37,350	30	2.94%	60%	0.53	0.09	0.1	2,100	190	0.92%	60%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.00	0.00	0.41	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-12	700	0	0.000%	150%	0.00	0.00	0.0		500	1	2.794%	150%	0.05	0.01	0.6	37,350	30	2.94%	150%	1.32	0.23	0.2	2,100	190	0.92%	150%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.00	0.00	0.55	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-12	700	0	0.000%	75%	0.00	0.00	0.0		500	1	2.794%	75%	0.02	0.00	0.3	37,350	30	2.94%	75%	0.66	0.12	0.1	2,100	190	0.92%	75%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.00	0.00	0.43	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-12	700	0	0.000%	75%	0.00	0.00	0.0		500	1	2.794%	75%	0.02	0.00	0.3	37,350	30	2.94%	75%	0.66	0.12	0.1	2,100	190	0.92%	75%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.00	0.00	0.43	0.0	0.4	0.2	0.22	0.22	0.17	1.34	1.55	4.45	
Dec-12	700	0	0.000%	100%	0.00	0.00	0.0		500	1	2.794%	100%	0.03	0.01	0.4	37,350	30	2.94%	100%	0.88	0.16	0.1	2,100	190	0.92%	100%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.17	0.22	0.47	0.0	0.7	0.3	0.34	0.35	0.28	1.73	1.91	5.00	
Jan-13	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	37,300	17	2.94%	60%	0.29	0.05	0.0	4,500	376	1.60%	60%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.28	0.35	1.12	0.0	1.5	0.6	0.75	0.72	0.57	2.57	2.64	5.98	
Feb-13	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	37,300	17	2.94%	75%	0.37	0.07	0.1	4,500	376	1.60%	75%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.57	0.72	1.13	0.0	1.8	0.7	0.94	0.90	0.72	2.92	2.93	6.33	
Mar-13	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	37,300	17	2.94%	70%	0.34	0.06	0.1	4,500	376	1.60%	70%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.72	0.90	1.12	0.0	2.0	0.8	1.04	0.99	0.79	3.08	3.06	6.48	
Apr-13	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	37,300	17	2.94%	175%	0.86	0.15	0.1	4,500	376	1.60%	175%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.79	0.99	1.22	1.0	1.2	0.5	0.62	0.59	0.47	2.31	2.42	5.70	
May-13	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	37,300	17	2.94%	170%	0.83	0.15	0.1	4,500	376	1.60%	170%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.47	0.59	1.21	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-13	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	37,300	17	2.94%	150%	0.74	0.13	0.1	4,500	376	1.60%	150%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.00	0.00	1.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-13	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	37,300	17	2.94%	40%	0.20	0.03	0.0	4,500	376	1.60%	40%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.00	0.00	1.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-13	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	37,300	17	2.94%	60%	0.29	0.05	0.0	4,500	376	1.60%	60%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.00	0.00	1.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-13	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	37,300	17	2.94%	150%	0.74	0.13	0.1	4,500	376	1.60%	150%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.00	0.00	1.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-13	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	37,300	17	2.94%	75%	0.37	0.07	0.1	4,500	376	1.60%	75%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.00	0.00	1.13	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-13	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	37,300	17	2.94%	75%	0.37	0.07	0.1	4,500	376	1.60%	75%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.00	0.00	1.13	0.0	1.1	0.4	0.58	0.55	0.44	2.23	2.35	5.60	
Dec-13	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	37,300	17	2.94%	100%	0.49	0.09	0.1	4,500	376	1.60%	100%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.44	0.55	1.15	0.0	1.7	0.7	0.87	0.83	0.67	2.80	2.83	6.20	
Jan-14	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,950	21	2.94%	60%	0.37	0.07	0.1	7,200	468	1.98%	60%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.67	0.83	1.70	0.0	2.5	0.9	1.36	1.18	0.94	3.39	3.31	6.76	
Feb-14	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,950	21	2.94%	75%	0.46	0.08	0.1	7,200	468	1.98%	75%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.94	1.18	1.72	0.0	2.9	1.1	1.55	1.35	1.08	3.65	3.52	6.99	
Mar-14	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	38,950	21	2.94%	70%	0.43	0.08	0.1	7,200	468	1.98%	70%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	1.08	1.35	1.72	0.0	3.1	1.1	1.64	1.42	1.14	3.76	3.60	7.08	
Apr-14	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	38,950	21	2.94%	175%	1.07	0.19	0.2	7,200	468	1.98%	175%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	1.14	1.42	1.83	1.0	2.3	0.8	1.21	1.05	0.84	3.17	3.14	6.57	
May-14	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	38,950	21	2.94%	170%	1.04	0.18	0.2	7,200	468	1.98%	170%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.84	1.05	1.82	2.0	0.9	0.3	0.47	0.40	0.32	1.88	2.05	5.19	
Jun-14	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,950	21	2.94%	150%	0.92	0.16	0.1	7,200	468	1.98%	150%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.32	0.40	1.80	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-14	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	38,950	21	2.94%	40%	0.25	0.04	0.0	7,200	468	1.98%	40%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.00	0.00	1.68	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-14	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,950	21	2.94%	60%	0.37	0.07	0.1	7,200	468	1.98%	60%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.00	0.00	1.70	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-14	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,950	21	2.94%	150%	0.92	0.16	0.1	7,200	468	1.98%	150%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.00	0.00	1.80	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-14	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,950	21	2.94%	75%	0.46	0.08	0.1	7,200	468	1.98%	75%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.00	0.00	1.72	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-14	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,950	21	2.94%	75%	0.46	0.08	0.1	7,200	468	1.98%	75%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.00	0.00	1.72	0.0	1.7	0.6	0.92	0.80	0.64	2.74	2.78	6.14	
Dec-14	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	38,950	21	2.94%	100%	0.61	0.11	0.1	7,200	468	1.98%	100%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.64	0.80	1.75	0.0	2.5	0.9	1.36	1.18	0.95	3.40	3.32	6.77	
Jan-15	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	40,600	28	2.94%	60%	0.50	0.09	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.95	1.18	0.09	0.0	1.3	0.5	0.64	0.63	0.50	2.40	2.50	5.79	
Feb-15	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	40,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.50	0.63	0.11	0.0	0.7	0.3	0.37	0.37	0.29	1.79	1.96	5.07	
Mar-15	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	40,600	28	2.94%	70%	0.58	0.10	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.29	0.37	0.10	0.0	0.5	0.2	0.24	0.23	0.19	1.39	1.60	4.53	
Apr-15	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	40,600	28	2.94%	175%	1.46	0.26	0.2	0	0	0.00%	175%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.19	0.23	0.26	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-15	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	40,600	28	2.94%	170%	1.42	0.25	0.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.25	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-15	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	40,600	28	2.94%	150%	1.25	0.22	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-15	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	40,600	28	2.94%	40%	0.33	0.06	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-15	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	40,600	28	2.94%	60%	0.50	0.09	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.09	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-15	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	40,600	28	2.94%	150%	1.25	0.22	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-15	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	40,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.11	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-15	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	40,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.11	0.0	0.1	0.0	0.06	0.05	0.04	0.63	0.83	3.17	
Dec-15	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	40,600	28	2.94%	100%	0.83	0.15	0.1	0	0	0.00%	100%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.04	0.05	0.15	0.0	0.2	0.1	0.10	0.10	0.08	0.87	1.09	3.68	
Jan-16	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	40,000	31	2.94%	60%	0.54	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.08	0.10	0.10	0.0	0.2	0.1	0.10	0.10	0.08	0.86	1.08	3.66	
Feb-16	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	40,000	31	2.94%	75%	0.68	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.08	0.10	0.12	0.0	0.2	0.1	0.11	0.11	0.09	0.92	1.14	3.75	
Mar-16	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	40,000	31	2.94%	70%	0.63	0.11	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.09	0.11	0.11	0.0	0.2	0.1	0.11	0.11	0.09	0.92	1.14	3.77	

WLWB Ammonia Model - Base Case

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Apr-16	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	40,000	31	2.94%	175%	1.59	0.28	0.2	0	0	0.00%	175%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.09	0.11	0.28	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-16	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	40,000	31	2.94%	170%	1.54	0.27	0.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.27	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-16	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	40,000	31	2.94%	150%	1.36	0.24	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.24	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-16	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	40,000	31	2.94%	40%	0.36	0.06	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-16	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	40,000	31	2.94%	60%	0.54	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-16	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	40,000	31	2.94%	150%	1.36	0.24	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.24	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-16	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	40,000	31	2.94%	75%	0.68	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.12	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-16	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	40,000	31	2.94%	75%	0.68	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.12	0.0	0.1	0.0	0.06	0.06	0.05	0.66	0.87	3.24	
Dec-16	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	40,000	31	2.94%	100%	0.91	0.16	0.1	0	0	0.00%	100%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.05	0.06	0.16	0.0	0.2	0.1	0.11	0.11	0.09	0.92	1.14	3.76	
Jan-17	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	39,500	38	2.94%	60%	0.66	0.12	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.09	0.11	0.12	0.0	0.2	0.1	0.11	0.11	0.09	0.94	1.16	3.80	
Feb-17	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	39,500	38	2.94%	75%	0.83	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.09	0.11	0.15	0.0	0.3	0.1	0.13	0.13	0.10	1.01	1.23	3.93	
Mar-17	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	39,500	38	2.94%	70%	0.77	0.14	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.10	0.13	0.14	0.0	0.3	0.1	0.13	0.13	0.11	1.03	1.25	3.95	
Apr-17	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	39,500	38	2.94%	175%	1.93	0.34	0.3	0	0	0.00%	175%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.11	0.13	0.34	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-17	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	39,500	38	2.94%	170%	1.87	0.33	0.3	0	0	0.00%	170%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.33	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-17	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	39,500	38	2.94%	150%	1.65	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-17	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	39,500	38	2.94%	40%	0.44	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-17	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	39,500	38	2.94%	60%	0.66	0.12	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-17	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	39,500	38	2.94%	150%	1.65	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-17	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	39,500	38	2.94%	75%	0.83	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.15	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-17	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	39,500	38	2.94%	75%	0.83	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.15	0.0	0.1	0.1	0.07	0.07	0.06	0.74	0.95	3.40	
Dec-17	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	39,500	38	2.94%	100%	1.10	0.20	0.2	0	0	0.00%	100%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.06	0.07	0.20	0.0	0.3	0.1	0.13	0.14	0.11	1.03	1.25	3.96	
Jan-18	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	39,000	37	2.94%	60%	0.65	0.11	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.11	0.14	0.11	0.0	0.2	0.1	0.12	0.13	0.10	0.99	1.21	3.89	
Feb-18	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	39,000	37	2.94%	75%	0.81	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.10	0.13	0.14	0.0	0.3	0.1	0.13	0.14	0.11	1.03	1.25	3.96	
Mar-18	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	39,000	37	2.94%	70%	0.75	0.13	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.11	0.14	0.13	0.0	0.3	0.1	0.13	0.14	0.11	1.04	1.26	3.97	
Apr-18	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	39,000	37	2.94%	175%	1.89	0.33	0.3	0	0	0.00%	175%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.11	0.14	0.33	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-18	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	39,000	37	2.94%	170%	1.83	0.32	0.3	0	0	0.00%	170%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.32	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-18	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	39,000	37	2.94%	150%	1.62	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-18	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	39,000	37	2.94%	40%	0.43	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-18	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	39,000	37	2.94%	60%	0.65	0.11	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.11	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-18	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	39,000	37	2.94%	150%	1.62	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-18	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	39,000	37	2.94%	75%	0.81	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.14	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-18	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	39,000	37	2.94%	75%	0.81	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.14	0.0	0.1	0.1	0.07	0.07	0.06	0.73	0.94	3.39	
Dec-18	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	39,000	37	2.94%	100%	1.08	0.19	0.2	0	0	0.00%	100%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.06	0.07	0.19	0.0	0.3	0.1	0.13	0.13	0.11	1.02	1.24	3.94	
Jan-19	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,500	33	2.94%	60%	0.57	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.11	0.13	0.10	0.0	0.2	0.1	0.12	0.12	0.10	0.96	1.18	3.84	
Feb-19	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,500	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.10	0.12	0.13	0.0	0.2	0.1	0.12	0.13	0.10	0.99	1.21	3.88	
Mar-19	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	38,500	33	2.94%	70%	0.67	0.12	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.10	0.13	0.12	0.0	0.2	0.1	0.12	0.12	0.10	0.98	1.20	3.87	
Apr-19	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	38,500	33	2.94%	175%	1.67	0.30	0.3	0	0	0.00%	175%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.10	0.12	0.30	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-19	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	38,500	33	2.94%	170%	1.62	0.29	0.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.29	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-19	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,500	33	2.94%	150%	1.43	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-19	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	38,500	33	2.94%	40%	0.38	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.07	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-19	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,500	33	2.94%	60%	0.57	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-19	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,500	33	2.94%	150%	1.43	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-19	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,500	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.13	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-19	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,500	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.13	0.0	0.1	0.1	0.06	0.06	0.05	0.69	0.90	3.30	
Dec-19	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	38,500	33	2.94%	100%	0.96	0.17	0.1	0	0	0.00%	100%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.05	0.06	0.17	0.0	0.2	0.1	0.11	0.12	0.10	0.96	1.18	3.83	
Jan-20	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	42,600	38	2.94%	60%	0.68	0.12	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.10	0.12	0.12	0.0	0.2	0.1	0.12	0.12	0.09	0.94	1.16	3.81	
Feb-20	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	42,600	38	2.94%	75%	0.85	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.09	0.12	0.15	0.0	0.3	0.1	0.14	0.13	0.10	1.00	1.22	3.91	
Mar-20	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	42,600	38	2.94%	70%	0.79	0.14	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.10	0.13	0.14	0.0	0.3	0.1	0.14	0.13	0.10	1.01	1.23	3.92	
Apr-20	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	42,600	38	2.94%	175%	1.97	0.35	0.3	0	0	0.00%	175%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.10	0.13	0.35	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-20	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	42,600	38	2.94%	170%	1.92	0.34	0.3	0	0	0.00%	170%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.34	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-20	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	42,600	38	2.94%	150%	1.69	0.30	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.30	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-20	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	42,600	38	2.94%	40%	0.45	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-20	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	42,600	38	2.94%	60%	0.68	0.12	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Base Case

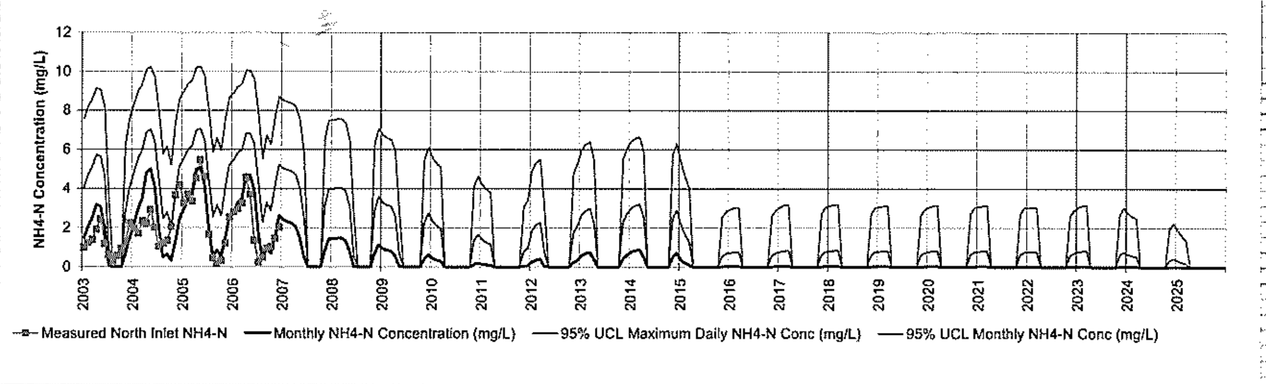
	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Sep-20	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	42,600	38	2.94%	150%	1.69	0.30	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.30	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-20	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	42,600	38	2.94%	75%	0.85	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.15	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-20	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	42,600	38	2.94%	75%	0.85	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.15	0.0	0.1	0.1	0.08	0.07	0.06	0.73	0.94	3.39	
Dec-20	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	42,600	38	2.94%	100%	1.13	0.20	0.2	0	0	0.00%	100%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.06	0.07	0.20	0.0	0.3	0.1	0.14	0.13	0.11	1.02	1.24	3.93	
Jan-21	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	46,800	40	2.94%	60%	0.71	0.13	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.11	0.13	0.13	0.0	0.3	0.1	0.14	0.12	0.09	0.96	1.18	3.83	
Feb-21	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	46,800	40	2.94%	75%	0.88	0.16	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.09	0.12	0.16	0.0	0.3	0.1	0.15	0.13	0.10	0.99	1.21	3.89	
Mar-21	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	46,800	40	2.94%	70%	0.82	0.15	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.10	0.13	0.15	0.0	0.3	0.1	0.15	0.13	0.10	0.99	1.21	3.89	
Apr-21	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	46,800	40	2.94%	175%	2.06	0.36	0.3	0	0	0.00%	175%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.10	0.13	0.36	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-21	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	46,800	40	2.94%	170%	2.00	0.35	0.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.35	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-21	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	46,800	40	2.94%	150%	1.76	0.31	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.31	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-21	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	46,800	40	2.94%	40%	0.47	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-21	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	46,800	40	2.94%	60%	0.71	0.13	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-21	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	46,800	40	2.94%	150%	1.76	0.31	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.31	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-21	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	46,800	40	2.94%	75%	0.88	0.16	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.16	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-21	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	46,800	40	2.94%	75%	0.88	0.16	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.16	0.0	0.2	0.1	0.08	0.07	0.06	0.73	0.94	3.39	
Dec-21	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	46,800	40	2.94%	100%	1.18	0.21	0.1	0	0	0.00%	100%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.06	0.07	0.21	0.0	0.3	0.1	0.15	0.13	0.10	1.01	1.23	3.91	
Jan-22	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	42,200	32	2.94%	60%	0.56	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.10	0.13	0.10	0.0	0.2	0.1	0.12	0.11	0.09	0.92	1.14	3.77	
Feb-22	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	42,200	32	2.94%	75%	0.70	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.09	0.11	0.12	0.0	0.2	0.1	0.12	0.11	0.09	0.94	1.16	3.79	
Mar-22	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	42,200	32	2.94%	70%	0.65	0.12	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.09	0.11	0.12	0.0	0.2	0.1	0.12	0.11	0.09	0.93	1.15	3.77	
Apr-22	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	42,200	32	2.94%	175%	1.63	0.29	0.2	0	0	0.00%	175%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.09	0.11	0.29	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-22	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	42,200	32	2.94%	170%	1.58	0.28	0.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.28	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-22	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	42,200	32	2.94%	150%	1.40	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-22	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	42,200	32	2.94%	40%	0.37	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.07	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-22	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	42,200	32	2.94%	60%	0.56	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-22	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	42,200	32	2.94%	150%	1.40	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-22	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	42,200	32	2.94%	75%	0.70	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.12	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-22	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	42,200	32	2.94%	75%	0.70	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.12	0.0	0.1	0.0	0.06	0.06	0.05	0.66	0.87	3.24	
Dec-22	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	42,200	32	2.94%	100%	0.93	0.16	0.1	0	0	0.00%	100%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.05	0.06	0.16	0.0	0.2	0.1	0.12	0.11	0.09	0.92	1.14	3.76	
Jan-23	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	37,700	35	2.94%	60%	0.62	0.11	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.09	0.11	0.11	0.0	0.2	0.1	0.11	0.11	0.09	0.93	1.15	3.78	
Feb-23	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	37,700	35	2.94%	75%	0.77	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.09	0.11	0.14	0.0	0.2	0.1	0.12	0.13	0.10	1.00	1.22	3.90	
Mar-23	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	37,700	35	2.94%	70%	0.72	0.13	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.10	0.13	0.13	0.0	0.3	0.1	0.12	0.13	0.11	1.01	1.23	3.93	
Apr-23	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	37,700	35	2.94%	175%	1.80	0.32	0.3	0	0	0.00%	175%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.11	0.13	0.32	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-23	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	37,700	35	2.94%	170%	1.75	0.31	0.3	0	0	0.00%	170%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.31	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-23	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	37,700	35	2.94%	150%	1.54	0.27	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.27	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-23	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	37,700	35	2.94%	40%	0.41	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.07	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-23	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	37,700	35	2.94%	60%	0.62	0.11	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.11	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-23	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	37,700	35	2.94%	150%	1.54	0.27	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.27	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-23	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	37,700	35	2.94%	75%	0.77	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.14	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-23	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	37,700	35	2.94%	75%	0.77	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.14	0.0	0.1	0.1	0.07	0.07	0.06	0.72	0.93	3.36	
Dec-23	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	37,700	35	2.94%	100%	1.03	0.18	0.2	0	0	0.00%	100%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.06	0.07	0.18	0.0	0.3	0.1	0.12	0.13	0.10	1.01	1.23	3.92	
Jan-24	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,300	10	2.94%	60%	0.18	0.03	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.10	0.13	0.03	0.0	0.2	0.1	0.08	0.08	0.07	0.78	1.00	3.50	
Feb-24	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,300	10	2.94%	75%	0.22	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.07	0.08	0.04	0.0	0.1	0.0	0.06	0.06	0.05	0.67	0.88	3.26	
Mar-24	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	38,300	10	2.94%	70%	0.21	0.04	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.05	0.06	0.04	0.0	0.1	0.0	0.05	0.05	0.04	0.60	0.80	3.09	
Apr-24	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	38,300	10	2.94%	175%	0.51	0.09	0.1	0	0	0.00%	175%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.04	0.05	0.09	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-24	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	38,300	10	2.94%	170%	0.50	0.09	0.1	0	0	0.00%	170%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.09	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-24	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,300	10	2.94%	150%	0.44	0.08	0.1	0	0	0.00%	150%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-24	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	38,300	10	2.94%	40%	0.12	0.02	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.02	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-24	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,300	10	2.94%	60%	0.18	0.03	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.03	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-24	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,300	10	2.94%	150%	0.44	0.08	0.1	0	0	0.00%	150%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-24	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,300	10	2.94%	75%	0.22	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.04	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-24	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,300	10	2.94%	75%	0.22	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.04	0.0	0.0	0.0	0.02	0.02	0.02	0.36	0.53	2.46	
Dec-24	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	38,300	10	2.94%	100%	0.29	0.05	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.02	0.02	0.05	0.0	0.1	0.0	0.04	0.04	0.03	0.50	0.70	2.87	
Jan-25	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,900	0	2.94%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.03	0.04	0.00	0.0	0.0	0.0	0.02	0.02	0.01	0.35	0.51	2.42	

WLWB Ammonia Model - Base Case

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Feb-25	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,900	0	2.94%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.01	0.02	0.00	0.0	0.0	0.0	0.01	0.01	0.01	0.24	0.38	2.05	
Mar-25	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	38,900	0	2.94%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.01	0.01	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.16	0.28	1.73	
Apr-25	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	38,900	0	2.94%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-25	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	38,900	0	2.94%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-25	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,900	0	2.94%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-25	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	38,900	0	2.94%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-25	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,900	0	2.94%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-25	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,900	0	2.94%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-25	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,900	0	2.94%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-25	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,900	0	2.94%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-25	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	38,900	0	2.94%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Improved Blasting Methods Combo#1

WLWB AMMONIA MANAGEMENT MODEL OF DIAVIK PROJECT				
CASE:	**Improved Blasting Methods**			
BLASTING:	Combo#1: Open hole; 80% emulsion/ANFO mix; no liner; wet holes pumped and double primed; two day limit on loaded holes prior to detonation (45% avg, 60% peak)			
AN USE:	Past and future use as per Diavik ADP projections (SNC-Lavalin, Ammonia Balance, May 2006)			
MINE INFLOW:	Actual to present, predicted inflows (Golder, 2006) in future.			
WATER MANAGEMENT:	All mine water discharged to North Inlet			
TREATMENT:	No additional treatment; natural biological degradation in North Inlet to continue at current rate.			
FLOW TO LAC DE GRAS:	Actual to present, future discharge equal to input in same month.			
RESULTS	**FROM BEGINNING OF**	**03**	**07**	**08**
AMMONIA (N) TO LDG	**TO END OF**	**06**	**07**	**25**
	Average	2.3	1.1	0.1
	Maximum 30 Day	5.1	2.4	1.5
	Maximum 1 Day	8.6	5.7	4.3
	Maximum 95% UCL 30 Day	7.1	5.0	4.1
	Maximum 95% UCL 1 Day	10.3	8.5	7.6



WLWB Ammonia Model - Improved Blasting Methods Combo#1

	SURFACE MINE A154								SURFACE MINE A418						
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)
Jan-03	5,380	867	0.924%	60%	4.80	0.85	5.2	8.4	0	0	0.00%	60%	0.00	0.00	0.0
Feb-03	5,667	867	0.924%	75%	6.00	1.06	6.2	7.5	0	0	0.00%	75%	0.00	0.00	0.0
Mar-03	5,954	867	0.924%	70%	5.60	0.99	5.5	5.1	0	0	0.00%	70%	0.00	0.00	0.0
Apr-03	6,251	867	0.924%	175%	14.01	2.48	13.0	10.5	0	0	0.00%	175%	0.00	0.00	0.0
May-03	5,936	867	0.924%	170%	13.61	2.41	13.3	5.4	0	0	0.00%	170%	0.00	0.00	0.0
Jun-03	7,290	867	0.924%	150%	12.01	2.13	9.6	3.2	0	0	0.00%	150%	0.00	0.00	0.0
Jul-03	6,867	867	0.924%	40%	3.20	0.57	2.7	6.7	0	0	0.00%	40%	0.00	0.00	0.0
Aug-03	7,753	867	0.924%	60%	4.80	0.85	3.6	6.1	0	0	0.00%	60%	0.00	0.00	0.0
Sep-03	8,194	867	0.924%	150%	12.01	2.13	8.5	8.4	0	0	0.00%	150%	0.00	0.00	0.0
Oct-03	8,775	867	0.924%	75%	6.00	1.06	4.0	6.6	0	0	0.00%	75%	0.00	0.00	0.0
Nov-03	8,935	867	0.924%	75%	6.00	1.06	3.9	6.5	0	0	0.00%	75%	0.00	0.00	0.0
Dec-03	8,301	867	0.924%	100%	8.01	1.42	5.6	5.1	0	0	0.00%	100%	0.00	0.00	0.0
Jan-04	8,570	808	1.598%	60%	7.75	1.37	5.3	4.3	0	0	0.00%	60%	0.00	0.00	0.0
Feb-04	7,982	808	1.598%	75%	9.69	1.72	7.1	5.9	0	0	0.00%	75%	0.00	0.00	0.0
Mar-04	8,828	808	1.598%	70%	9.04	1.60	6.0	6.0	0	0	0.00%	70%	0.00	0.00	0.0
Apr-04	9,324	808	1.598%	175%	22.60	4.00	14.1	5.3	0	0	0.00%	175%	0.00	0.00	0.0
May-04	10,755	808	1.598%	170%	21.95	3.89	11.9	9.3	0	0	0.00%	170%	0.00	0.00	0.0
Jun-04	12,337	808	1.598%	150%	19.37	3.43	9.1	5.3	0	0	0.00%	150%	0.00	0.00	0.0
Jul-04	11,098	808	1.598%	40%	5.17	0.92	2.7	13.4	0	0	0.00%	40%	0.00	0.00	0.0
Aug-04	11,394	808	1.598%	60%	7.75	1.37	4.0	8.9	0	0	0.00%	60%	0.00	0.00	0.0
Sep-04	12,030	808	1.598%	150%	19.37	3.43	9.4	6.7	0	0	0.00%	150%	0.00	0.00	0.0
Oct-04	11,948	808	1.598%	75%	9.69	1.72	4.7	6.5	0	0	0.00%	75%	0.00	0.00	0.0
Nov-04	11,300	808	1.598%	75%	9.69	1.72	5.0	7.5	0	0	0.00%	75%	0.00	0.00	0.0
Dec-04	10,514	808	1.598%	100%	12.91	2.29	7.2	5.1	0	0	0.00%	100%	0.00	0.00	0.0
Jan-05	10,958	725	1.979%	60%	8.61	1.53	4.6	4.5	0	0	0.00%	60%	0.00	0.00	0.0
Feb-05	11,359	725	1.979%	75%	10.76	1.91	5.5	4.5	0	0	0.00%	75%	0.00	0.00	0.0
Mar-05	12,270	725	1.979%	70%	10.04	1.78	4.8	5.8	0	0	0.00%	70%	0.00	0.00	0.0
Apr-05	13,110	725	1.979%	175%	25.11	4.45	11.2	11.5	0	0	0.00%	175%	0.00	0.00	0.0
May-05	14,120	725	1.979%	170%	24.39	4.32	10.1	11.7	0	0	0.00%	170%	0.00	0.00	0.0
Jun-05	15,045	725	1.979%	150%	21.52	3.81	8.3	10.7	0	0	0.00%	150%	0.00	0.00	0.0
Jul-05	15,261	725	1.979%	40%	5.74	1.02	2.2	5.1	0	0	0.00%	40%	0.00	0.00	0.0
Aug-05	14,863	725	1.979%	60%	8.61	1.53	3.4	3.3	0	0	0.00%	60%	0.00	0.00	0.0
Sep-05	15,820	725	1.979%	150%	21.52	3.81	7.9	2.2	0	0	0.00%	150%	0.00	0.00	0.0
Oct-05	15,681	725	1.979%	75%	10.76	1.91	4.0	2.6	0	0	0.00%	75%	0.00	0.00	0.0
Nov-05	15,693	725	1.979%	75%	10.76	1.91	4.0	3.6	0	0	0.00%	75%	0.00	0.00	0.0
Dec-05	14,884	725	1.979%	100%	14.35	2.54	5.6	6.3	0	0	0.00%	100%	0.00	0.00	0.0
Jan-06	15,584	642	2.256%	60%	8.69	1.54	3.2	3.7	250	0	0.00%	60%	0.00	0.00	0.0
Feb-06	15,104	642	2.256%	75%	10.86	1.92	4.2	4.8	250	0	0.00%	75%	0.00	0.00	0.0
Mar-06	15,618	642	2.256%	70%	10.14	1.80	3.8	3.1	250	0	0.00%	70%	0.00	0.00	0.0
Apr-06	16,453	642	2.256%	175%	25.34	4.49	9.0	9.6	250	0	0.00%	175%	0.00	0.00	0.0
May-06	19,475	642	2.256%	170%	24.61	4.36	7.4	5.3	250	0	0.00%	170%	0.00	0.00	0.0
Jun-06	18,310	642	2.256%	150%	21.72	3.85	6.9	3.4	250	0	0.00%	150%	0.00	0.00	0.0
Jul-06	17,677	642	2.256%	40%	5.79	1.03	1.9	4.4	250	0	0.00%	40%	0.00	0.00	0.0
Aug-06	18,560	642	2.256%	60%	8.69	1.54	2.7	7.3	250	0	0.00%	60%	0.00	0.00	0.0
Sep-06	19,176	642	2.256%	150%	21.72	3.85	6.6	5.4	250	0	0.00%	150%	0.00	0.00	0.0
Oct-06	18,487	642	2.256%	75%	10.86	1.92	3.4	3.7	250	0	0.00%	75%	0.00	0.00	0.0
Nov-06	19,635	642	2.256%	75%	10.86	1.92	3.2	2.4	250	0	0.00%	75%	0.00	0.00	0.0
Dec-06	17,652	642	2.256%	100%	14.48	2.57	4.8	4.5	250	0	0.00%	100%	0.00	0.00	0.0
Jan-07	17,200	408	1.535%	85%	5.35	0.95	1.8		500	400	1.00%	85%	3.42	0.61	39.8
Feb-07	17,200	408	1.535%	91%	5.70	1.01	1.9		500	400	1.00%	91%	3.64	0.64	42.3
Mar-07	17,200	408	1.535%	89%	5.58	0.99	1.9		500	400	1.00%	89%	3.56	0.63	41.5
Apr-07	17,200	408	1.535%	127%	7.97	1.41	2.7		500	400	1.00%	127%	5.09	0.90	59.3
May-07	17,200	408	1.535%	125%	7.86	1.39	2.7		500	400	1.00%	125%	5.02	0.89	58.4

	UNDERGROUND MINES A418/A154							SURFACE MINE A21						
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)
Jan-03	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0
Feb-03	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Mar-03	0	0	0.00%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0
Apr-03	0	0	0.00%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0
May-03	0	0	0.00%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0
Jun-03	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0
Jul-03	0	0	0.00%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0
Aug-03	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0
Sep-03	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0
Oct-03	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Nov-03	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Dec-03	0	0	0.00%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0
Jan-04	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0
Feb-04	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Mar-04	0	0	0.00%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0
Apr-04	0	0	0.00%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0
May-04	0	0	0.00%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0
Jun-04	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0
Jul-04	0	0	0.00%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0
Aug-04	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0
Sep-04	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0
Oct-04	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Nov-04	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Dec-04	0	0	0.00%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0
Jan-05	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0
Feb-05	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Mar-05	0	0	0.00%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0
Apr-05	0	0	0.00%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0
May-05	0	0	0.00%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0
Jun-05	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0
Jul-05	0	0	0.00%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0
Aug-05	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0
Sep-05	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0
Oct-05	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Nov-05	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Dec-05	0	0	0.00%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0
Jan-06	0	46	2.94%	60%	0.81	0.14	#DIV/0!	0	0	0.00%	60%	0.00	0.00	0.0
Feb-06	0	46	2.94%	75%	1.01	0.18	#DIV/0!	0	0	0.00%	75%	0.00	0.00	0.0
Mar-06	0	46	2.94%	70%	0.94	0.17	#DIV/0!	0	0	0.00%	70%	0.00	0.00	0.0
Apr-06	0	46	2.94%	175%	2.35	0.42	#DIV/0!	0	0	0.00%	175%	0.00	0.00	0.0
May-06	0	46	2.94%	170%	2.28	0.40	#DIV/0!	0	0	0.00%	170%	0.00	0.00	0.0
Jun-06	22	46	2.94%	150%	2.01	0.36	531.3	0	0	0.00%	150%	0.00	0.00	0.0
Jul-06	40	46	2.94%	40%	0.54	0.10	77.3	0	0	0.00%	40%	0.00	0.00	0.0
Aug-06	38	46	2.94%	60%	0.81	0.14	122.6	0	0	0.00%	60%	0.00	0.00	0.0
Sep-06	154	46	2.94%	150%	2.01	0.36	76.1	0	0	0.00%	150%	0.00	0.00	0.0
Oct-06	430	46	2.94%	75%	1.01	0.18	13.6	0	0	0.00%	75%	0.00	0.00	0.0
Nov-06	687	46	2.94%	75%	1.01	0.18	8.5	0	0	0.00%	75%	0.00	0.00	0.0
Dec-06	929	46	2.94%	100%	1.34	0.24	8.4	0	0	0.00%	100%	0.00	0.00	0.0
Jan-07	8,200	33	1.00%	85%	0.28	0.05	0.2	0	0	1.535%	85%	0.00	0.00	0.0
Feb-07	8,200	33	1.00%	91%	0.30	0.05	0.2	0	0	1.535%	91%	0.00	0.00	0.0
Mar-07	8,200	33	1.00%	89%	0.29	0.05	0.2	0	0	1.535%	89%	0.00	0.00	0.0
Apr-07	8,200	33	1.00%	127%	0.41	0.07	0.3	0	0	1.535%	127%	0.00	0.00	0.0
May-07	8,200	33	1.00%	125%	0.41	0.07	0.3	0	0	1.535%	125%	0.00	0.00	0.0

	NORTH INLET																	
Date	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Jan-03	1.25	5380	1.41	32000	17,905	1.00	1.25	0.85	0.0	2.1	1.5	0.81	1.29	1.49	4.35	4.06	7.57	1.0
Feb-03	1.25	5667	1.42	32000	17,175	1.49	1.86	1.06	0.0	2.9	2.1	1.07	1.65	2.05	5.20	4.70	8.20	1.3
Mar-03	1.25	5954	1.43	32000	16,854	2.05	2.57	0.99	0.0	3.6	2.5	1.28	2.29	2.49	5.78	5.12	8.60	1.4
Apr-03	1.25	6251	1.44	32000	16,875	2.49	3.11	2.48	1.0	4.6	3.2	1.64	2.96	3.19	6.62	5.73	9.14	1.9
May-03	1.25	5936	1.43	32000	25,514	3.19	3.99	2.41	2.0	4.4	3.1	2.39	2.01	3.07	6.49	5.64	9.06	2.5
Jun-03	1.25	7290	1.47	32000	29,485	3.07	3.84	2.13	3.0	3.0	2.0	1.81	1.16	2.02	5.15	4.66	8.16	1.2
Jul-03	1.25	6867	1.46	32000	28,379	2.02	2.52	0.57	3.0	0.1	0.1	0.05	0.04	0.06	0.76	0.98	3.45	0.6
Aug-03	1.25	7753	1.49	32000	27,138	0.06	0.08	0.85	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.2
Sep-03	1.25	8194	1.50	32000	29,865	0.00	0.00	2.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.6
Oct-03	1.25	8775	1.52	32000	27,977	0.00	0.00	1.06	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.9
Nov-03	1.25	8935	1.52	32000	15,411	0.00	0.00	1.06	0.0	1.1	0.7	0.33	0.74	0.70	2.87	2.89	6.28	1.3
Dec-03	1.25	8301	1.50	32000	24,385	0.70	0.87	1.42	0.0	2.3	1.5	1.13	1.16	1.53	4.42	4.11	7.62	2.2
Jan-04	1.25	8570	1.51	32000	13,372	1.53	1.91	1.37	0.0	3.3	2.2	0.88	2.40	2.17	5.36	4.82	8.31	2.0
Feb-04	1.25	7982	1.49	32000	7,407	2.17	2.71	1.72	0.0	4.4	3.0	0.67	3.76	2.97	6.37	5.55	8.98	1.7
Mar-04	1.25	8828	1.52	32000	3,826	2.97	3.71	1.60	0.0	5.3	3.5	0.41	4.91	3.50	6.97	5.97	9.35	2.4
Apr-04	1.25	9324	1.53	32000	0	3.50	4.37	4.00	1.0	7.4	4.8	0.00	7.38	4.81	8.30	6.89	10.12	2.2
May-04	1.25	10755	1.58	32000	0	4.81	6.01	3.89	2.0	7.9	5.0	0.00	7.90	5.01	8.49	7.02	10.22	2.9
Jun-04	1.25	12337	1.63	32000	16,027	5.01	6.26	3.43	3.0	6.7	4.1	2.01	4.69	4.12	7.63	6.43	9.74	2.0
Jul-04	1.25	11098	1.59	32000	25,310	4.12	5.15	0.92	3.0	3.1	1.9	1.49	1.58	1.93	5.03	4.57	8.07	1.1
Aug-04	1.25	11394	1.60	32000	28,658	1.93	2.41	1.37	3.0	0.8	0.5	0.43	0.36	0.49	2.37	2.47	5.76	1.2
Sep-04	1.25	12030	1.62	32000	27,577	0.49	0.62	3.43	3.0	1.0	0.6	0.54	0.50	0.65	2.76	2.80	6.17	1.3
Oct-04	1.25	11948	1.61	32000	13,563	0.65	0.81	1.72	2.0	0.5	0.3	0.14	0.39	0.33	1.89	2.06	5.20	2.1
Nov-04	1.25	11300	1.59	32000	12,590	0.33	0.41	1.72	0.0	2.1	1.3	0.51	1.61	1.33	4.10	3.87	7.37	3.7
Dec-04	1.25	10514	1.57	32000	11,561	1.33	1.67	2.29	0.0	4.0	2.5	0.89	3.07	2.52	5.82	5.15	8.62	4.2
Jan-05	1.25	10958	1.58	32000	10,692	2.52	3.15	1.53	0.0	4.7	3.0	0.96	3.72	2.95	6.35	5.53	8.97	3.3
Feb-05	1.25	11359	1.60	32000	12,385	2.95	3.69	1.91	0.0	5.6	3.5	1.32	4.28	3.51	6.98	5.98	9.36	3.7
Mar-05	1.25	12270	1.62	32000	12,748	3.51	4.39	1.78	0.0	6.2	3.8	1.47	4.69	3.80	7.29	6.20	9.55	3.4
Apr-05	1.25	13110	1.65	32000	13,667	3.80	4.75	4.45	1.0	8.2	5.0	2.07	6.13	4.97	8.46	7.00	10.20	4.6
May-05	1.25	14120	1.68	32000	16,000	4.97	6.22	4.32	2.0	8.5	5.1	2.47	6.06	5.08	8.56	7.07	10.26	5.5
Jun-05	1.25	15045	1.71	32000	17,531	5.08	6.35	3.81	3.0	7.2	4.2	2.24	4.93	4.20	7.70	6.48	9.79	4.6
Jul-05	1.25	15261	1.71	32000	8,477	4.20	5.25	1.02	3.0	3.3	1.9	0.49	2.77	1.90	4.99	4.54	8.05	1.7
Aug-05	1.25	14863	1.70	32000	17,738	1.90	2.38	1.53	3.0	0.9	0.5	0.29	0.62	0.53	2.48	2.56	5.87	0.5
Sep-05	1.25	15820	1.73	32000	24,395	0.53	0.67	3.81	3.0	1.5	0.9	0.63	0.85	0.86	3.21	3.17	6.60	0.2
Oct-05	1.25	15681	1.73	32000	21,915	0.86	1.07	1.91	2.0	1.0	0.6	0.38	0.60	0.57	2.56	2.63	5.96	0.3
Nov-05	1.25	15693	1.73	32000	17,253	0.57	0.71	1.91	0.0	2.6	1.5	0.79	1.82	1.51	4.40	4.10	7.60	1.2
Dec-05	1.25	14884	1.70	32000	14,961	1.51	1.89	2.54	0.0	4.4	2.6	1.19	3.25	2.60	5.92	5.23	8.69	2.6
Jan-06	1.25	15834	1.73	32000	15,041	2.60	3.26	1.68	0.0	4.9	2.9	1.30	3.63	2.85	6.23	5.45	8.89	2.8
Feb-06	1.25	15354	1.72	32000	15,114	2.85	3.56	2.10	0.0	5.7	3.3	1.52	4.15	3.30	6.75	5.82	9.22	3.0
Mar-06	1.25	15868	1.73	32000	19,356	3.30	4.13	1.96	0.0	6.1	3.5	2.07	4.02	3.51	6.99	5.99	9.36	3.3
Apr-06	1.25	16703	1.76	32000	17,439	3.51	4.39	4.91	1.0	8.3	4.7	2.50	5.80	4.72	8.22	6.84	10.07	4.6
May-06	1.25	19725	1.85	32000	20,203	4.72	5.90	4.77	2.0	8.7	4.7	2.88	5.79	4.69	8.18	6.81	10.06	3.7
Jun-06	1.25	18582	1.82	32000	27,717	4.69	5.86	4.21	3.0	7.1	3.9	3.28	3.78	3.89	7.39	6.27	9.60	1.4
Jul-06	1.25	17967	1.80	32000	22,154	3.89	4.86	1.12	3.0	3.0	1.7	1.12	1.87	1.66	4.63	4.27	7.78	0.2
Aug-06	1.25	18849	1.82	32000	18,801	1.66	2.08	1.68	3.0	0.8	0.4	0.24	0.52	0.42	2.16	2.29	5.52	0.5
Sep-06	1.25	19580	1.85	32000	25,748	0.42	0.52	4.21	3.0	1.7	0.9	0.73	0.99	0.94	3.37	3.30	6.75	1.0
Oct-06	1.25	19166	1.83	32000	26,010	0.94	1.17	2.10	2.0	1.3	0.7	0.55	0.72	0.69	2.86	2.88	6.27	1.1
Nov-06	1.25	20572	1.88	32000	23,981	0.69	0.87	2.10	0.0	3.0	1.6	1.16	1.82	1.58	4.51	4.18	7.69	1.5
Dec-06	1.25	18831	1.82	32000	19,976	1.58	1.98	2.80	0.0	4.8	2.6	1.59	3.19	2.62	5.95	5.25	8.71	2.1
Jan-07	1.25	25900	2.04	32000	25,900	2.62	3.28	1.60	0.0	4.9	2.4	1.89	3.00	2.40	5.66	5.04	8.52	
Feb-07	1.25	25900	2.04	32000	25,900	2.40	3.00	1.71	0.0	4.7	2.3	1.82	2.88	2.31	5.54	4.95	8.44	
Mar-07	1.25	25900	2.04	32000	25,900	2.31	2.88	1.67	0.0	4.6	2.2	1.76	2.79	2.24	5.45	4.88	8.37	
Apr-07	1.25	25900	2.04	32000	25,900	2.24	2.79	2.39	1.0	4.2	2.1	1.62	2.57	2.05	5.20	4.70	8.20	
May-07	1.25	25900	2.04	45000	25,900	2.05	2.57	2.35	2.0	2.9	1.4	1.13	1.79	1.43	4.27	4.00	7.50	

WLWB Ammonia Model - Improved Blasting Methods Combo#1

	SURFACE MINE A154								SURFACE MINE A418						
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)
Jun-07	17,200	408	1.535%	118%	7.41	1.31	2.5		500	400	1.00%	118%	4.73	0.84	55.0
Jul-07	17,200	408	1.535%	78%	4.90	0.87	1.7		500	400	1.00%	78%	3.13	0.55	36.4
Aug-07	17,200	408	1.535%	85%	5.35	0.95	1.8		500	400	1.00%	85%	3.42	0.61	39.8
Sep-07	17,200	408	1.535%	118%	7.41	1.31	2.5		500	400	1.00%	118%	4.73	0.84	55.0
Oct-07	17,200	408	1.535%	91%	5.70	1.01	1.9		500	400	1.00%	91%	3.64	0.64	42.3
Nov-07	17,200	408	1.535%	91%	5.70	1.01	1.9		500	400	1.00%	91%	3.64	0.64	42.3
Dec-07	17,200	408	1.535%	100%	6.27	1.11	2.1		500	400	1.00%	100%	4.00	0.71	46.6
Jan-08	8,950	90	1.535%	85%	1.18	0.21	0.8		500	808	1.00%	85%	6.91	1.22	80.4
Feb-08	8,950	90	1.535%	91%	1.26	0.22	0.8		500	808	1.00%	91%	7.35	1.30	85.6
Mar-08	8,950	90	1.535%	89%	1.23	0.22	0.8		500	808	1.00%	89%	7.20	1.28	83.9
Apr-08	8,950	90	1.535%	127%	1.76	0.31	1.1		500	808	1.00%	127%	10.29	1.82	119.8
May-08	8,950	90	1.535%	125%	1.73	0.31	1.1		500	808	1.00%	125%	10.14	1.80	118.1
Jun-08	8,950	90	1.535%	118%	1.63	0.29	1.1		500	808	1.00%	118%	9.55	1.69	111.2
Jul-08	8,950	90	1.535%	78%	1.08	0.19	0.7		500	808	1.00%	78%	6.32	1.12	73.6
Aug-08	8,950	90	1.535%	85%	1.18	0.21	0.8		500	808	1.00%	85%	6.91	1.22	80.4
Sep-08	8,950	90	1.535%	118%	1.63	0.29	1.1		500	808	1.00%	118%	9.55	1.69	111.2
Oct-08	8,950	90	1.535%	91%	1.26	0.22	0.8		500	808	1.00%	91%	7.35	1.30	85.6
Nov-08	8,950	90	1.535%	91%	1.26	0.22	0.8		500	808	1.00%	91%	7.35	1.30	85.6
Dec-08	8,950	90	1.535%	100%	1.38	0.24	0.9		500	808	1.00%	100%	8.08	1.43	94.1
Jan-09	700	0	1.535%	85%	0.00	0.00	0.0		500	600	1.00%	85%	5.13	0.91	59.7
Feb-09	700	0	1.535%	91%	0.00	0.00	0.0		500	600	1.00%	91%	5.45	0.97	63.5
Mar-09	700	0	1.535%	89%	0.00	0.00	0.0		500	600	1.00%	89%	5.35	0.95	62.2
Apr-09	700	0	1.535%	127%	0.00	0.00	0.0		500	600	1.00%	127%	7.64	1.35	88.9
May-09	700	0	1.535%	125%	0.00	0.00	0.0		500	600	1.00%	125%	7.53	1.33	87.7
Jun-09	700	0	1.535%	118%	0.00	0.00	0.0		500	600	1.00%	118%	7.09	1.26	82.6
Jul-09	700	0	1.535%	78%	0.00	0.00	0.0		500	600	1.00%	78%	4.69	0.83	54.6
Aug-09	700	0	1.535%	85%	0.00	0.00	0.0		500	600	1.00%	85%	5.13	0.91	59.7
Sep-09	700	0	1.535%	118%	0.00	0.00	0.0		500	600	1.00%	118%	7.09	1.26	82.6
Oct-09	700	0	1.535%	91%	0.00	0.00	0.0		500	600	1.00%	91%	5.45	0.97	63.5
Nov-09	700	0	1.535%	91%	0.00	0.00	0.0		500	600	1.00%	91%	5.45	0.97	63.5
Dec-09	700	0	1.535%	100%	0.00	0.00	0.0		500	600	1.00%	100%	6.00	1.06	69.9
Jan-10	700	0	1.535%	85%	0.00	0.00	0.0		500	183	1.00%	85%	1.57	0.28	18.2
Feb-10	700	0	1.535%	91%	0.00	0.00	0.0		500	183	1.00%	91%	1.67	0.30	19.4
Mar-10	700	0	1.535%	89%	0.00	0.00	0.0		500	183	1.00%	89%	1.63	0.29	19.0
Apr-10	700	0	1.535%	127%	0.00	0.00	0.0		500	183	1.00%	127%	2.33	0.41	27.2
May-10	700	0	1.535%	125%	0.00	0.00	0.0		500	183	1.00%	125%	2.30	0.41	26.8
Jun-10	700	0	1.535%	118%	0.00	0.00	0.0		500	183	1.00%	118%	2.17	0.38	25.2
Jul-10	700	0	1.535%	78%	0.00	0.00	0.0		500	183	1.00%	78%	1.43	0.25	16.7
Aug-10	700	0	1.535%	85%	0.00	0.00	0.0		500	183	1.00%	85%	1.57	0.28	18.2
Sep-10	700	0	1.535%	118%	0.00	0.00	0.0		500	183	1.00%	118%	2.17	0.38	25.2
Oct-10	700	0	1.535%	91%	0.00	0.00	0.0		500	183	1.00%	91%	1.67	0.30	19.4
Nov-10	700	0	1.535%	91%	0.00	0.00	0.0		500	183	1.00%	91%	1.67	0.30	19.4
Dec-10	700	0	1.535%	100%	0.00	0.00	0.0		500	183	1.00%	100%	1.83	0.32	21.3
Jan-11	700	0	1.535%	85%	0.00	0.00	0.0		500	23	1.00%	85%	0.20	0.04	2.3
Feb-11	700	0	1.535%	91%	0.00	0.00	0.0		500	23	1.00%	91%	0.21	0.04	2.5
Mar-11	700	0	1.535%	89%	0.00	0.00	0.0		500	23	1.00%	89%	0.21	0.04	2.4
Apr-11	700	0	1.535%	127%	0.00	0.00	0.0		500	23	1.00%	127%	0.30	0.05	3.5
May-11	700	0	1.535%	125%	0.00	0.00	0.0		500	23	1.00%	125%	0.29	0.05	3.4
Jun-11	700	0	1.535%	118%	0.00	0.00	0.0		500	23	1.00%	118%	0.28	0.05	3.2
Jul-11	700	0	1.535%	78%	0.00	0.00	0.0		500	23	1.00%	78%	0.18	0.03	2.1
Aug-11	700	0	1.535%	85%	0.00	0.00	0.0		500	23	1.00%	85%	0.20	0.04	2.3
Sep-11	700	0	1.535%	118%	0.00	0.00	0.0		500	23	1.00%	118%	0.28	0.05	3.2
Oct-11	700	0	1.535%	91%	0.00	0.00	0.0		500	23	1.00%	91%	0.21	0.04	2.5

	UNDERGROUND MINES A418/A154							SURFACE MINE A21						
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)
Jun-07	8,200	33	1.00%	118%	0.38	0.07	0.3	0	0	1.535%	118%	0.00	0.00	0.0
Jul-07	8,200	33	1.00%	78%	0.25	0.05	0.2	0	0	1.535%	78%	0.00	0.00	0.0
Aug-07	8,200	33	1.00%	85%	0.28	0.05	0.2	0	0	1.535%	85%	0.00	0.00	0.0
Sep-07	8,200	33	1.00%	118%	0.38	0.07	0.3	0	0	1.535%	118%	0.00	0.00	0.0
Oct-07	8,200	33	1.00%	91%	0.30	0.05	0.2	0	0	1.535%	91%	0.00	0.00	0.0
Nov-07	8,200	33	1.00%	91%	0.30	0.05	0.2	0	0	1.535%	91%	0.00	0.00	0.0
Dec-07	8,200	33	1.00%	100%	0.33	0.06	0.2	0	0	1.535%	100%	0.00	0.00	0.0
Jan-08	24,600	28	1.00%	85%	0.24	0.04	0.1	0	0	1.535%	85%	0.00	0.00	0.0
Feb-08	24,600	28	1.00%	91%	0.26	0.05	0.1	0	0	1.535%	91%	0.00	0.00	0.0
Mar-08	24,600	28	1.00%	89%	0.25	0.04	0.1	0	0	1.535%	89%	0.00	0.00	0.0
Apr-08	24,600	28	1.00%	127%	0.36	0.06	0.1	0	0	1.535%	127%	0.00	0.00	0.0
May-08	24,600	28	1.00%	125%	0.36	0.06	0.1	0	0	1.535%	125%	0.00	0.00	0.0
Jun-08	24,600	28	1.00%	118%	0.33	0.06	0.1	0	0	1.535%	118%	0.00	0.00	0.0
Jul-08	24,600	28	1.00%	78%	0.22	0.04	0.1	0	0	1.535%	78%	0.00	0.00	0.0
Aug-08	24,600	28	1.00%	85%	0.24	0.04	0.1	0	0	1.535%	85%	0.00	0.00	0.0
Sep-08	24,600	28	1.00%	118%	0.33	0.06	0.1	0	0	1.535%	118%	0.00	0.00	0.0
Oct-08	24,600	28	1.00%	91%	0.26	0.05	0.1	0	0	1.535%	91%	0.00	0.00	0.0
Nov-08	24,600	28	1.00%	91%	0.26	0.05	0.1	0	0	1.535%	91%	0.00	0.00	0.0
Dec-08	24,600	28	1.00%	100%	0.28	0.05	0.1	0	0	1.535%	100%	0.00	0.00	0.0
Jan-09	40,900	18	1.00%	85%	0.15	0.03	0.0	0	0	1.535%	85%	0.00	0.00	0.0
Feb-09	40,900	18	1.00%	91%	0.16	0.03	0.0	0	0	1.535%	91%	0.00	0.00	0.0
Mar-09	40,900	18	1.00%	89%	0.16	0.03	0.0	0	0	1.535%	89%	0.00	0.00	0.0
Apr-09	40,900	18	1.00%	127%	0.22	0.04	0.0	0	0	1.535%	127%	0.00	0.00	0.0
May-09	40,900	18	1.00%	125%	0.22	0.04	0.0	0	0	1.535%	125%	0.00	0.00	0.0
Jun-09	40,900	18	1.00%	118%	0.21	0.04	0.0	0	0	1.535%	118%	0.00	0.00	0.0
Jul-09	40,900	18	1.00%	78%	0.14	0.02	0.0	0	0	1.535%	78%	0.00	0.00	0.0
Aug-09	40,900	18	1.00%	85%	0.15	0.03	0.0	0	0	1.535%	85%	0.00	0.00	0.0
Sep-09	40,900	18	1.00%	118%	0.21	0.04	0.0	0	0	1.535%	118%	0.00	0.00	0.0
Oct-09	40,900	18	1.00%	91%	0.16	0.03	0.0	0	0	1.535%	91%	0.00	0.00	0.0
Nov-09	40,900	18	1.00%	91%	0.16	0.03	0.0	0	0	1.535%	91%	0.00	0.00	0.0
Dec-09	40,900	18	1.00%	100%	0.18	0.03	0.0	0	0	1.535%	100%	0.00	0.00	0.0
Jan-10	39,200	11	1.00%	85%	0.09	0.02	0.0	0	0	1.535%	85%	0.00	0.00	0.0
Feb-10	39,200	11	1.00%	91%	0.10	0.02	0.0	0	0	1.535%	91%	0.00	0.00	0.0
Mar-10	39,200	11	1.00%	89%	0.10	0.02	0.0	0	0	1.535%	89%	0.00	0.00	0.0
Apr-10	39,200	11	1.00%	127%	0.14	0.02	0.0	0	0	1.535%	127%	0.00	0.00	0.0
May-10	39,200	11	1.00%	125%	0.14	0.02	0.0	0	0	1.535%	125%	0.00	0.00	0.0
Jun-10	39,200	11	1.00%	118%	0.13	0.02	0.0	0	0	1.535%	118%	0.00	0.00	0.0
Jul-10	39,200	11	1.00%	78%	0.09	0.02	0.0	0	0	1.535%	78%	0.00	0.00	0.0
Aug-10	39,200	11	1.00%	85%	0.09	0.02	0.0	0	0	1.535%	85%	0.00	0.00	0.0
Sep-10	39,200	11	1.00%	118%	0.13	0.02	0.0	0	0	1.535%	118%	0.00	0.00	0.0
Oct-10	39,200	11	1.00%	91%	0.10	0.02	0.0	0	0	1.535%	91%	0.00	0.00	0.0
Nov-10	39,200	11	1.00%	91%	0.10	0.02	0.0	0	0	1.535%	91%	0.00	0.00	0.0
Dec-10	39,200	11	1.00%	100%	0.11	0.02	0.0	0	0	1.535%	100%	0.00	0.00	0.0
Jan-11	37,400	33	1.00%	85%	0.28	0.05	0.0	0	0	1.535%	85%	0.00	0.00	0.0
Feb-11	37,400	33	1.00%	91%	0.30	0.05	0.0	0	0	1.535%	91%	0.00	0.00	0.0
Mar-11	37,400	33	1.00%	89%	0.29	0.05	0.0	0	0	1.535%	89%	0.00	0.00	0.0
Apr-11	37,400	33	1.00%	127%	0.41	0.07	0.1	0	0	1.535%	127%	0.00	0.00	0.0
May-11	37,400	33	1.00%	125%	0.41	0.07	0.1	0	0	1.535%	125%	0.00	0.00	0.0
Jun-11	37,400	33	1.00%	118%	0.38	0.07	0.1	0	0	1.535%	118%	0.00	0.00	0.0
Jul-11	37,400	33	1.00%	78%	0.25	0.05	0.0	0	0	1.535%	78%	0.00	0.00	0.0
Aug-11	37,400	33	1.00%	85%	0.28	0.05	0.0	0	0	1.535%	85%	0.00	0.00	0.0
Sep-11	37,400	33	1.00%	118%	0.38	0.07	0.1	0	0	1.535%	118%	0.00	0.00	0.0
Oct-11	37,400	33	1.00%	91%	0.30	0.05	0.0	0	0	1.535%	91%	0.00	0.00	0.0

	NORTH INLET																	
Date	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Jun-07	1.25	25900	2.04	45000	25,900	1.43	1.79	2.22	3.0	1.0	0.5	0.39	0.62	0.50	2.38	2.48	5.77	
Jul-07	1.25	25900	2.04	45000	25,900	0.50	0.62	1.47	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-07	1.25	25900	2.04	45000	25,900	0.00	0.00	1.60	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-07	1.25	25900	2.04	45000	25,900	0.00	0.00	2.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-07	1.25	25900	2.04	45000	25,900	0.00	0.00	1.71	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-07	1.25	25900	2.04	45000	25,900	0.00	0.00	1.71	0.0	1.7	0.8	0.66	1.05	0.84	3.17	3.14	6.57	
Dec-07	1.25	25900	2.04	45000	25,900	0.84	1.05	1.88	0.0	2.9	1.4	1.13	1.79	1.43	4.27	4.00	7.50	
Jan-08	1.25	34050	2.29	45000	34,050	1.43	1.79	1.48	0.0	3.3	1.4	1.48	1.79	1.43	4.26	3.99	7.50	
Feb-08	1.25	34050	2.29	45000	34,050	1.43	1.79	1.57	0.0	3.4	1.5	1.52	1.84	1.47	4.32	4.04	7.55	
Mar-08	1.25	34050	2.29	45000	34,050	1.47	1.84	1.54	0.0	3.4	1.5	1.53	1.85	1.48	4.34	4.05	7.56	
Apr-08	1.25	34050	2.29	45000	34,050	1.48	1.85	2.20	1.0	3.0	1.3	1.38	1.67	1.33	4.10	3.87	7.37	
May-08	1.25	34050	2.29	45000	34,050	1.33	1.67	2.17	2.0	1.8	0.8	0.83	1.00	0.80	3.10	3.08	6.50	
Jun-08	1.25	34050	2.29	45000	34,050	0.80	1.00	2.04	3.0	0.0	0.0	0.02	0.02	0.02	0.40	0.57	2.57	
Jul-08	1.25	34050	2.29	45000	34,050	0.02	0.02	1.35	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-08	1.25	34050	2.29	45000	34,050	0.00	0.00	1.48	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-08	1.25	34050	2.29	45000	34,050	0.00	0.00	2.04	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-08	1.25	34050	2.29	45000	34,050	0.00	0.00	1.57	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-08	1.25	34050	2.29	45000	34,050	0.00	0.00	1.57	0.0	1.6	0.7	0.71	0.86	0.69	2.85	2.87	6.25	
Dec-08	1.25	34050	2.29	45000	34,050	0.69	0.86	1.73	0.0	2.6	1.1	1.17	1.41	1.13	3.75	3.59	7.07	
Jan-09	1.25	42100	2.53	60000	42,100	1.13	1.41	0.94	0.0	2.3	0.9	1.19	1.16	0.93	3.36	3.29	6.74	
Feb-09	1.25	42100	2.53	60000	42,100	0.93	1.16	0.99	0.0	2.2	0.9	1.09	1.06	0.85	3.20	3.16	6.59	
Mar-09	1.25	42100	2.53	60000	42,100	0.85	1.06	0.97	0.0	2.0	0.8	1.03	1.01	0.81	3.11	3.09	6.50	
Apr-09	1.25	42100	2.53	60000	42,100	0.81	1.01	1.39	1.0	1.4	0.6	0.71	0.69	0.55	2.53	2.61	5.93	
May-09	1.25	42100	2.53	60000	42,100	0.55	0.69	1.37	2.0	0.1	0.0	0.03	0.03	0.03	0.47	0.65	2.77	
Jun-09	1.25	42100	2.53	60000	42,100	0.03	0.03	1.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-09	1.25	42100	2.53	60000	42,100	0.00	0.00	0.86	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-09	1.25	42100	2.53	60000	42,100	0.00	0.00	0.94	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-09	1.25	42100	2.53	60000	42,100	0.00	0.00	1.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-09	1.25	42100	2.53	60000	42,100	0.00	0.00	0.99	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-09	1.25	42100	2.53	60000	42,100	0.00	0.00	0.99	0.0	1.0	0.4	0.50	0.49	0.39	2.09	2.23	5.45	
Dec-09	1.25	42100	2.53	60000	42,100	0.39	0.49	1.09	0.0	1.6	0.6	0.80	0.78	0.63	2.71	2.76	6.11	
Jan-10	1.25	40400	2.48	60000	40,400	0.63	0.78	0.29	0.0	1.1	0.4	0.53	0.54	0.43	2.21	2.34	5.58	
Feb-10	1.25	40400	2.48	60000	40,400	0.43	0.54	0.31	0.0	0.9	0.3	0.42	0.43	0.35	1.95	2.11	5.27	
Mar-10	1.25	40400	2.48	60000	40,400	0.35	0.43	0.31	0.0	0.7	0.3	0.37	0.37	0.30	1.80	1.97	5.08	
Apr-10	1.25	40400	2.48	60000	40,400	0.30	0.37	0.44	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-10	1.25	40400	2.48	60000	40,400	0.00	0.00	0.43	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-10	1.25	40400	2.48	60000	40,400	0.00	0.00	0.41	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-10	1.25	40400	2.48	60000	40,400	0.00	0.00	0.27	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-10	1.25	40400	2.48	60000	40,400	0.00	0.00	0.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-10	1.25	40400	2.48	60000	40,400	0.00	0.00	0.41	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-10	1.25	40400	2.48	60000	40,400	0.00	0.00	0.31	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-10	1.25	40400	2.48	60000	40,400	0.00	0.00	0.31	0.0	0.3	0.1	0.16	0.16	0.13	1.12	1.34	4.11	
Dec-10	1.25	40400	2.48	60000	40,400	0.13	0.16	0.34	0.0	0.5	0.2	0.25	0.25	0.20	1.45	1.66	4.62	
Jan-11	1.25	38600	2.42	60000	38,600	0.20	0.25	0.08	0.0	0.3	0.1	0.16	0.17	0.14	1.18	1.40	4.21	
Feb-11	1.25	38600	2.42	60000	38,600	0.14	0.17	0.09	0.0	0.3	0.1	0.13	0.14	0.11	1.03	1.25	3.96	
Mar-11	1.25	38600	2.42	60000	38,600	0.11	0.14	0.09	0.0	0.2	0.1	0.11	0.12	0.09	0.95	1.17	3.81	
Apr-11	1.25	38600	2.42	60000	38,600	0.09	0.12	0.13	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-11	1.25	38600	2.42	60000	38,600	0.00	0.00	0.12	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-11	1.25	38600	2.42	60000	38,600	0.00	0.00	0.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-11	1.25	38600	2.42	60000	38,600	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-11	1.25	38600	2.42	60000	38,600	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-11	1.25	38600	2.42	60000	38,600	0.00	0.00	0.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-11	1.25	38600	2.42	60000	38,600	0.00	0.00	0.09	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Improved Blasting Methods Combo#1

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154						
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)
Nov-11	700	0	1.535%	91%	0.00	0.00	0.0		500	23	1.00%	91%	0.21	0.04	2.5	37,400	33	1.00%	91%	0.30	0.05	0.0
Dec-11	700	0	1.535%	100%	0.00	0.00	0.0		500	23	1.00%	100%	0.23	0.04	2.7	37,400	33	1.00%	100%	0.33	0.06	0.1
Jan-12	700	0	1.535%	85%	0.00	0.00	0.0		500	1	1.00%	85%	0.01	0.00	0.1	37,350	30	1.00%	85%	0.26	0.05	0.0
Feb-12	700	0	1.535%	91%	0.00	0.00	0.0		500	1	1.00%	91%	0.01	0.00	0.1	37,350	30	1.00%	91%	0.27	0.05	0.0
Mar-12	700	0	1.535%	89%	0.00	0.00	0.0		500	1	1.00%	89%	0.01	0.00	0.1	37,350	30	1.00%	89%	0.27	0.05	0.0
Apr-12	700	0	1.535%	127%	0.00	0.00	0.0		500	1	1.00%	127%	0.01	0.00	0.2	37,350	30	1.00%	127%	0.38	0.07	0.1
May-12	700	0	1.535%	125%	0.00	0.00	0.0		500	1	1.00%	125%	0.01	0.00	0.2	37,350	30	1.00%	125%	0.38	0.07	0.1
Jun-12	700	0	1.535%	118%	0.00	0.00	0.0		500	1	1.00%	118%	0.01	0.00	0.2	37,350	30	1.00%	118%	0.35	0.06	0.1
Jul-12	700	0	1.535%	78%	0.00	0.00	0.0		500	1	1.00%	78%	0.01	0.00	0.1	37,350	30	1.00%	78%	0.23	0.04	0.0
Aug-12	700	0	1.535%	85%	0.00	0.00	0.0		500	1	1.00%	85%	0.01	0.00	0.1	37,350	30	1.00%	85%	0.26	0.05	0.0
Sep-12	700	0	1.535%	118%	0.00	0.00	0.0		500	1	1.00%	118%	0.01	0.00	0.2	37,350	30	1.00%	118%	0.35	0.06	0.1
Oct-12	700	0	1.535%	91%	0.00	0.00	0.0		500	1	1.00%	91%	0.01	0.00	0.1	37,350	30	1.00%	91%	0.27	0.05	0.0
Nov-12	700	0	1.535%	91%	0.00	0.00	0.0		500	1	1.00%	91%	0.01	0.00	0.1	37,350	30	1.00%	91%	0.27	0.05	0.0
Dec-12	700	0	1.535%	100%	0.00	0.00	0.0		500	1	1.00%	100%	0.01	0.00	0.1	37,350	30	1.00%	100%	0.30	0.05	0.0
Jan-13	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	37,300	17	1.00%	85%	0.14	0.03	0.0
Feb-13	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	37,300	17	1.00%	91%	0.15	0.03	0.0
Mar-13	700	0	1.535%	89%	0.00	0.00	0.0		500	0	1.00%	89%	0.00	0.00	0.0	37,300	17	1.00%	89%	0.15	0.03	0.0
Apr-13	700	0	1.535%	127%	0.00	0.00	0.0		500	0	1.00%	127%	0.00	0.00	0.0	37,300	17	1.00%	127%	0.21	0.04	0.0
May-13	700	0	1.535%	125%	0.00	0.00	0.0		500	0	1.00%	125%	0.00	0.00	0.0	37,300	17	1.00%	125%	0.21	0.04	0.0
Jun-13	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	37,300	17	1.00%	118%	0.20	0.03	0.0
Jul-13	700	0	1.535%	78%	0.00	0.00	0.0		500	0	1.00%	78%	0.00	0.00	0.0	37,300	17	1.00%	78%	0.13	0.02	0.0
Aug-13	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	37,300	17	1.00%	85%	0.14	0.03	0.0
Sep-13	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	37,300	17	1.00%	118%	0.20	0.03	0.0
Oct-13	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	37,300	17	1.00%	91%	0.15	0.03	0.0
Nov-13	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	37,300	17	1.00%	91%	0.15	0.03	0.0
Dec-13	700	0	1.535%	100%	0.00	0.00	0.0		500	0	1.00%	100%	0.00	0.00	0.0	37,300	17	1.00%	100%	0.17	0.03	0.0
Jan-14	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	38,950	21	1.00%	85%	0.18	0.03	0.0
Feb-14	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	38,950	21	1.00%	91%	0.19	0.03	0.0
Mar-14	700	0	1.535%	89%	0.00	0.00	0.0		500	0	1.00%	89%	0.00	0.00	0.0	38,950	21	1.00%	89%	0.19	0.03	0.0
Apr-14	700	0	1.535%	127%	0.00	0.00	0.0		500	0	1.00%	127%	0.00	0.00	0.0	38,950	21	1.00%	127%	0.27	0.05	0.0
May-14	700	0	1.535%	125%	0.00	0.00	0.0		500	0	1.00%	125%	0.00	0.00	0.0	38,950	21	1.00%	125%	0.26	0.05	0.0
Jun-14	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	38,950	21	1.00%	118%	0.25	0.04	0.0
Jul-14	700	0	1.535%	78%	0.00	0.00	0.0		500	0	1.00%	78%	0.00	0.00	0.0	38,950	21	1.00%	78%	0.16	0.03	0.0
Aug-14	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	38,950	21	1.00%	85%	0.18	0.03	0.0
Sep-14	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	38,950	21	1.00%	118%	0.25	0.04	0.0
Oct-14	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	38,950	21	1.00%	91%	0.19	0.03	0.0
Nov-14	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	38,950	21	1.00%	91%	0.19	0.03	0.0
Dec-14	700	0	1.535%	100%	0.00	0.00	0.0		500	0	1.00%	100%	0.00	0.00	0.0	38,950	21	1.00%	100%	0.21	0.04	0.0
Jan-15	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	40,600	28	1.00%	85%	0.24	0.04	0.0
Feb-15	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	40,600	28	1.00%	91%	0.26	0.05	0.0
Mar-15	700	0	1.535%	89%	0.00	0.00	0.0		500	0	1.00%	89%	0.00	0.00	0.0	40,600	28	1.00%	89%	0.25	0.04	0.0
Apr-15	700	0	1.535%	127%	0.00	0.00	0.0		500	0	1.00%	127%	0.00	0.00	0.0	40,600	28	1.00%	127%	0.36	0.06	0.1
May-15	700	0	1.535%	125%	0.00	0.00	0.0		500	0	1.00%	125%	0.00	0.00	0.0	40,600	28	1.00%	125%	0.36	0.06	0.1
Jun-15	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	40,600	28	1.00%	118%	0.33	0.06	0.0
Jul-15	700	0	1.535%	78%	0.00	0.00	0.0		500	0	1.00%	78%	0.00	0.00	0.0	40,600	28	1.00%	78%	0.22	0.04	0.0
Aug-15	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	40,600	28	1.00%	85%	0.24	0.04	0.0
Sep-15	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	40,600	28	1.00%	118%	0.33	0.06	0.0
Oct-15	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	40,600	28	1.00%	91%	0.26	0.05	0.0
Nov-15	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	40,600	28	1.00%	91%	0.26	0.05	0.0
Dec-15	700	0	1.535%	100%	0.00	0.00	0.0		500	0	1.00%	100%	0.00	0.00	0.0	40,600	28	1.00%	100%	0.28	0.05	0.0
Jan-16	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	40,000	31	1.00%	85%	0.26	0.05	0.0
Feb-16	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	40,000	31	1.00%	91%	0.28	0.05	0.0
Mar-16	700	0	1.535%	89%	0.00	0.00	0.0		500	0	1.00%	89%	0.00	0.00	0.0	40,000	31	1.00%	89%	0.27	0.05	0.0

	SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Nov-11	0	0	1.535%	91%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.09	0.0	0.1	0.0	0.04	0.05	0.04	0.57	0.77	3.04	
Dec-11	0	0	1.535%	100%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.04	0.05	0.10	0.0	0.1	0.1	0.07	0.07	0.06	0.74	0.96	3.42	
Jan-12	2,100	190	1.535%	85%	2.92	0.52	8.1	1.25	40650	2.49	60000	40,650	0.06	0.07	0.56	0.0	0.6	0.3	0.32	0.32	0.26	1.66	1.84	4.90	
Feb-12	2,100	190	1.535%	91%	2.92	0.52	8.1	1.25	40650	2.49	60000	40,650	0.26	0.32	0.57	0.0	0.9	0.4	0.44	0.45	0.36	1.99	2.14	5.32	
Mar-12	2,100	190	1.535%	89%	2.92	0.52	8.1	1.25	40650	2.49	60000	40,650	0.36	0.45	0.57	0.0	1.0	0.4	0.50	0.51	0.41	2.14	2.27	5.49	
Apr-12	2,100	190	1.535%	127%	2.92	0.52	8.1	1.25	40650	2.49	60000	40,650	0.41	0.51	0.59	1.0	0.1	0.0	0.05	0.05	0.04	0.58	0.79	3.07	
May-12	2,100	190	1.535%	125%	2.92	0.52	8.1	1.25	40650	2.49	60000	40,650	0.04	0.05	0.59	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-12	2,100	190	1.535%	118%	2.92	0.52	8.1	1.25	40650	2.49	60000	40,650	0.00	0.00	0.58	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-12	2,100	190	1.535%	78%	2.92	0.52	8.1	1.25	40650	2.49	60000	40,650	0.00	0.00	0.56	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-12	2,100	190	1.535%	85%	2.92	0.52	8.1	1.25	40650	2.49	60000	40,650	0.00	0.00	0.56	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-12	2,100	190	1.535%	118%	2.92	0.52	8.1	1.25	40650	2.49	60000	40,650	0.00	0.00	0.58	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-12	2,100	190	1.535%	91%	2.92	0.52	8.1	1.25	40650	2.49	60000	40,650	0.00	0.00	0.57	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-12	2,100	190	1.535%	91%	2.92	0.52	8.1	1.25	40650	2.49	60000	40,650	0.00	0.00	0.57	0.0	0.6	0.2	0.28	0.28	0.23	1.55	1.75	4.76	
Dec-12	2,100	190	1.535%	100%	2.92	0.52	8.1	1.25	40650	2.49	60000	40,650	0.23	0.28	0.57	0.0	0.9	0.3	0.43	0.43	0.34	1.95	2.11	5.27	
Jan-13	4,500	376	1.535%	85%	5.77	1.02	7.5	1.25	43000	2.56	60000	43,000	0.34	0.43	1.05	0.0	1.5	0.6	0.76	0.72	0.58	2.59	2.66	5.99	
Feb-13	4,500	376	1.535%	91%	5.77	1.02	7.5	1.25	43000	2.56	60000	43,000	0.58	0.72	1.05	0.0	1.8	0.7	0.91	0.87	0.69	2.86	2.88	6.26	
Mar-13	4,500	376	1.535%	89%	5.77	1.02	7.5	1.25	43000	2.56	60000	43,000	0.69	0.87	1.05	0.0	1.9	0.7	0.98	0.94	0.75	2.98	2.98	6.39	
Apr-13	4,500	376	1.535%	127%	5.77	1.02	7.5	1.25	43000	2.56	60000	43,000	0.75	0.94	1.06	1.0	1.0	0.4	0.51	0.49	0.39	2.08	2.22	5.43	
May-13	4,500	376	1.535%	125%	5.77	1.02	7.5	1.25	43000	2.56	60000	43,000	0.39	0.49	1.06	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-13	4,500	376	1.535%	118%	5.77	1.02	7.5	1.25	43000	2.56	60000	43,000	0.00	0.00	1.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-13	4,500	376	1.535%	78%	5.77	1.02	7.5	1.25	43000	2.56	60000	43,000	0.00	0.00	1.05	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-13	4,500	376	1.535%	85%	5.77	1.02	7.5	1.25	43000	2.56	60000	43,000	0.00	0.00	1.05	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-13	4,500	376	1.535%	118%	5.77	1.02	7.5	1.25	43000	2.56	60000	43,000	0.00	0.00	1.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-13	4,500	376	1.535%	91%	5.77	1.02	7.5	1.25	43000	2.56	60000	43,000	0.00	0.00	1.05	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-13	4,500	376	1.535%	91%	5.77	1.02	7.5	1.25	43000	2.56	60000	43,000	0.00	0.00	1.05	0.0	1.0	0.4	0.54	0.51	0.41	2.14	2.28	5.50	
Dec-13	4,500	376	1.535%	100%	5.77	1.02	7.5	1.25	43000	2.56	60000	43,000	0.41	0.51	1.05	0.0	1.6	0.6	0.80	0.76	0.61	2.67	2.72	6.07	
Jan-14	7,200	468	1.535%	85%	7.17	1.27	5.8	1.25	47350	2.69	60000	47,350	0.61	0.76	1.30	0.0	2.1	0.8	1.11	0.96	0.77	3.03	3.02	6.43	
Feb-14	7,200	468	1.535%	91%	7.17	1.27	5.8	1.25	47350	2.69	60000	47,350	0.77	0.96	1.30	0.0	2.3	0.8	1.21	1.05	0.84	3.18	3.15	6.58	
Mar-14	7,200	468	1.535%	89%	7.17	1.27	5.8	1.25	47350	2.69	60000	47,350	0.84	1.05	1.30	0.0	2.4	0.9	1.26	1.10	0.88	3.25	3.20	6.64	
Apr-14	7,200	468	1.535%	127%	7.17	1.27	5.8	1.25	47350	2.69	60000	47,350	0.88	1.10	1.32	1.0	1.4	0.5	0.76	0.66	0.53	2.46	2.55	5.85	
May-14	7,200	468	1.535%	125%	7.17	1.27	5.8	1.25	47350	2.69	60000	47,350	0.53	0.66	1.32	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-14	7,200	468	1.535%	118%	7.17	1.27	5.8	1.25	47350	2.69	60000	47,350	0.00	0.00	1.31	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-14	7,200	468	1.535%	78%	7.17	1.27	5.8	1.25	47350	2.69	60000	47,350	0.00	0.00	1.30	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-14	7,200	468	1.535%	85%	7.17	1.27	5.8	1.25	47350	2.69	60000	47,350	0.00	0.00	1.30	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-14	7,200	468	1.535%	118%	7.17	1.27	5.8	1.25	47350	2.69	60000	47,350	0.00	0.00	1.31	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-14	7,200	468	1.535%	91%	7.17	1.27	5.8	1.25	47350	2.69	60000	47,350	0.00	0.00	1.30	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-14	7,200	468	1.535%	91%	7.17	1.27	5.8	1.25	47350	2.69	60000	47,350	0.00	0.00	1.30	0.0	1.3	0.5	0.70	0.61	0.49	2.35	2.46	5.74	
Dec-14	7,200	468	1.535%	100%	7.17	1.27	5.8	1.25	47350	2.69	60000	47,350	0.49	0.61	1.31	0.0	1.9	0.7	1.02	0.89	0.71	2.90	2.92	6.31	
Jan-15	0	0	1.535%	85%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.71	0.89	0.04	0.0	0.9	0.4	0.47	0.46	0.37	2.03	2.17	5.36	
Feb-15	0	0	1.535%	91%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.37	0.46	0.05	0.0	0.5	0.2	0.26	0.25	0.20	1.45	1.65	4.61	
Mar-15	0	0	1.535%	89%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.20	0.25	0.04	0.0	0.3	0.1	0.15	0.15	0.12	1.08	1.30	4.04	
Apr-15	0	0	1.535%	127%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.12	0.15	0.06	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-15	0	0	1.535%	125%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.06	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-15	0	0	1.535%	118%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-15	0	0	1.535%	78%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.04	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-15	0	0	1.535%	85%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.04	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-15	0	0	1.535%	118%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-15	0	0	1.535%	91%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.05	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-15	0	0	1.535%	91%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.05	0.0	0.0	0.0	0.02	0.02	0.02	0.39	0.56	2.54	
Dec-15	0	0	1.535%	100%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.02	0.02	0.05	0.0	0.1	0.0	0.04	0.04	0.03	0.50	0.69	2.85	
Jan-16	0	0	1.535%	85%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.03	0.04	0.05	0.0	0.1	0.0	0.04	0.04	0.03	0.54	0.73	2.95	
Feb-16	0	0	1.535%	91%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.03	0.04	0.05	0.0	0.1	0.0	0.05	0.05	0.04	0.57	0.77	3.02	
Mar-16	0	0	1.535%	89%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.04	0.05	0.05	0.0	0.1	0.0	0.05	0.05	0.04	0.58	0.78	3.05	

WLWB Ammonia Model - Improved Blasting Methods Combo#1

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Apr-16	700	0	1.535%	127%	0.00	0.00	0.0		500	0	1.00%	127%	0.00	0.00	0.0	40,000	31	1.00%	127%	0.39	0.07	0.1	0	0	1.535%	127%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.04	0.05	0.07	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-16	700	0	1.535%	125%	0.00	0.00	0.0		500	0	1.00%	125%	0.00	0.00	0.0	40,000	31	1.00%	125%	0.39	0.07	0.1	0	0	1.535%	125%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.07	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-16	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	40,000	31	1.00%	118%	0.36	0.06	0.1	0	0	1.535%	118%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-16	700	0	1.535%	78%	0.00	0.00	0.0		500	0	1.00%	78%	0.00	0.00	0.0	40,000	31	1.00%	78%	0.24	0.04	0.0	0	0	1.535%	78%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.04	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-16	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	40,000	31	1.00%	85%	0.26	0.05	0.0	0	0	1.535%	85%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.05	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-16	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	40,000	31	1.00%	118%	0.36	0.06	0.1	0	0	1.535%	118%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-16	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	40,000	31	1.00%	91%	0.28	0.05	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.05	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-16	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	40,000	31	1.00%	91%	0.28	0.05	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.05	0.0	0.0	0.0	0.02	0.02	0.02	0.41	0.58	2.60	
Dec-16	700	0	1.535%	100%	0.00	0.00	0.0		500	0	1.00%	100%	0.00	0.00	0.0	40,000	31	1.00%	100%	0.31	0.05	0.0	0	0	1.535%	100%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.02	0.02	0.05	0.0	0.1	0.0	0.04	0.04	0.03	0.52	0.72	2.92	
Jan-17	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	39,500	38	1.00%	85%	0.32	0.06	0.0	0	0	1.535%	85%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.03	0.04	0.06	0.0	0.1	0.0	0.05	0.05	0.04	0.59	0.79	3.07	
Feb-17	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	39,500	38	1.00%	91%	0.34	0.06	0.1	0	0	1.535%	91%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.04	0.05	0.06	0.0	0.1	0.0	0.05	0.05	0.04	0.63	0.83	3.16	
Mar-17	700	0	1.535%	89%	0.00	0.00	0.0		500	0	1.00%	89%	0.00	0.00	0.0	39,500	38	1.00%	89%	0.33	0.06	0.0	0	0	1.535%	89%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.04	0.05	0.06	0.0	0.1	0.0	0.06	0.06	0.05	0.64	0.85	3.20	
Apr-17	700	0	1.535%	127%	0.00	0.00	0.0		500	0	1.00%	127%	0.00	0.00	0.0	39,500	38	1.00%	127%	0.48	0.08	0.1	0	0	1.535%	127%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.05	0.06	0.08	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-17	700	0	1.535%	125%	0.00	0.00	0.0		500	0	1.00%	125%	0.00	0.00	0.0	39,500	38	1.00%	125%	0.47	0.08	0.1	0	0	1.535%	125%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.08	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-17	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	39,500	38	1.00%	118%	0.44	0.08	0.1	0	0	1.535%	118%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-17	700	0	1.535%	78%	0.00	0.00	0.0		500	0	1.00%	78%	0.00	0.00	0.0	39,500	38	1.00%	78%	0.29	0.05	0.0	0	0	1.535%	78%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.05	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-17	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	39,500	38	1.00%	85%	0.32	0.06	0.0	0	0	1.535%	85%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-17	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	39,500	38	1.00%	118%	0.44	0.08	0.1	0	0	1.535%	118%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-17	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	39,500	38	1.00%	91%	0.34	0.06	0.1	0	0	1.535%	91%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.06	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-17	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	39,500	38	1.00%	91%	0.34	0.06	0.1	0	0	1.535%	91%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.06	0.0	0.1	0.0	0.03	0.03	0.02	0.45	0.64	2.73	
Dec-17	700	0	1.535%	100%	0.00	0.00	0.0		500	0	1.00%	100%	0.00	0.00	0.0	39,500	38	1.00%	100%	0.38	0.07	0.1	0	0	1.535%	100%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.02	0.03	0.07	0.0	0.1	0.0	0.05	0.05	0.04	0.59	0.79	3.07	
Jan-18	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	39,000	37	1.00%	85%	0.31	0.06	0.0	0	0	1.535%	85%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.04	0.05	0.06	0.0	0.1	0.0	0.05	0.05	0.04	0.61	0.82	3.13	
Feb-18	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	39,000	37	1.00%	91%	0.33	0.06	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.04	0.05	0.06	0.0	0.1	0.0	0.06	0.06	0.05	0.64	0.84	3.19	
Mar-18	700	0	1.535%	89%	0.00	0.00	0.0		500	0	1.00%	89%	0.00	0.00	0.0	39,000	37	1.00%	89%	0.33	0.06	0.0	0	0	1.535%	89%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.05	0.06	0.06	0.0	0.1	0.0	0.06	0.06	0.05	0.65	0.85	3.21	
Apr-18	700	0	1.535%	127%	0.00	0.00	0.0		500	0	1.00%	127%	0.00	0.00	0.0	39,000	37	1.00%	127%	0.47	0.08	0.1	0	0	1.535%	127%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.05	0.06	0.08	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-18	700	0	1.535%	125%	0.00	0.00	0.0		500	0	1.00%	125%	0.00	0.00	0.0	39,000	37	1.00%	125%	0.46	0.08	0.1	0	0	1.535%	125%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.08	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-18	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	39,000	37	1.00%	118%	0.43	0.08	0.1	0	0	1.535%	118%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-18	700	0	1.535%	78%	0.00	0.00	0.0		500	0	1.00%	78%	0.00	0.00	0.0	39,000	37	1.00%	78%	0.29	0.05	0.0	0	0	1.535%	78%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.05	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-18	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	39,000	37	1.00%	85%	0.31	0.06	0.0	0	0	1.535%	85%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-18	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	39,000	37	1.00%	118%	0.43	0.08	0.1	0	0	1.535%	118%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-18	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	39,000	37	1.00%	91%	0.33	0.06	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.06	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-18	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	39,000	37	1.00%	91%	0.33	0.06	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.06	0.0	0.1	0.0	0.03	0.03	0.02	0.45	0.63	2.72	
Dec-18	700	0	1.535%	100%	0.00	0.00	0.0		500	0	1.00%	100%	0.00	0.00	0.0	39,000	37	1.00%	100%	0.37	0.06	0.1	0	0	1.535%	100%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.02	0.03	0.06	0.0	0.1	0.0	0.05	0.05	0.04	0.58	0.78	3.06	
Jan-19	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	38,500	33	1.00%	85%	0.28	0.05	0.0	0	0	1.535%	85%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.04	0.05	0.05	0.0	0.1	0.0	0.05	0.05	0.04	0.59	0.79	3.08	
Feb-19	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	38,500	33	1.00%	91%	0.30	0.05	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.04	0.05	0.05	0.0	0.1	0.0	0.05	0.05	0.04	0.61	0.81	3.12	
Mar-19	700	0	1.535%	89%	0.00	0.00	0.0		500	0	1.00%	89%	0.00	0.00	0.0	38,500	33	1.00%	89%	0.29	0.05	0.0	0	0	1.535%	89%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.04	0.05	0.05	0.0	0.1	0.0	0.05	0.05	0.04	0.61	0.82	3.13	
Apr-19	700	0	1.535%	127%	0.00	0.00	0.0		500	0	1.00%	127%	0.00	0.00	0.0	38,500	33	1.00%	127%	0.41	0.07	0.1	0	0	1.535%	127%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.04	0.05	0.07	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-19	700	0	1.535%	125%	0.00	0.00	0.0		500	0	1.00%	125%	0.00	0.00	0.0	38,500	33	1.00%	125%	0.41	0.07	0.1	0	0	1.535%	125%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.07	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-19	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	38,500	33	1.00%	118%	0.38	0.07	0.1	0	0	1.535%	118%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.07	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-19	700	0	1.535%	78%	0.00	0.00	0.0		500	0	1.00%	78%	0.00	0.00	0.0	38,500	33	1.00%	78%	0.25	0.05	0.0	0	0	1.535%	78%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.05	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-19	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	38,500	33	1.00%	85%	0.28	0.05	0.0	0	0	1.535%	85%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.05	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-19	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	38,500	33	1.00%	118%	0.38	0.07	0.1	0	0	1.535%	118%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.07	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-19	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	38,500	33	1.00%	91%	0.30	0.05	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.05	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-19	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	38,500	33	1.00%	91%	0.30	0.05	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.05	0.0	0.1	0.0	0.03	0.03	0.02	0.42	0.60	2.65	
Dec-19	700	0	1.535%	100%	0.00	0.00	0.0		500	0	1.00%	100%	0.00	0.00	0.0	38,500	33	1.00%	100%	0.33	0.06	0.0	0	0	1.535%	100%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.02	0.03	0.06	0.0	0.1	0.0	0.04	0.04	0.03	0.55	0.75	2.98	
Jan-20	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	42,600	38	1.00%	85%	0.33	0.06	0.0	0	0	1.535%	85%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.03	0.04	0.06	0.0	0.1	0.0	0.05	0.05	0.04	0.59	0.79	3.08	
Feb-20	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	42,600	38	1.00%	91%	0.35	0.06	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.04	0.05	0.06	0.0	0.1	0.0	0.06	0.05	0.04	0.62	0.82	3.15	
Mar-20	700	0	1.535%	89%	0.00	0.00	0.0		500	0	1.00%	89%	0.00	0.00	0.0	42,600	38	1.00%	89%	0.34	0.06	0.0	0	0	1.535%	89%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.04	0.05	0.06	0.0	0.1	0.0	0.06	0.06	0.04	0.63	0.84	3.17	
Apr-20	700	0	1.535%	127%	0.00	0.00	0.0		500	0	1.00%	127%	0.00	0.00	0.0	42,600	38	1.00%	127%	0.49	0.09	0.1	0	0	1.535%	127%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.04	0.06	0.09	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-20	700	0	1.535%	125%	0.00	0.00	0.0		500	0	1.00%	125%	0.00	0.00	0.0	42,600	38	1.00%	125%	0.48	0.09	0.1	0	0	1.535%	125%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.09	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-20	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	42,600	38	1.00%	118%	0.45	0.08	0.1	0	0	1.535%	118%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-20	700	0	1.535%	78%	0.00	0.00	0.0		500	0	1.00%	78%	0.00	0.00	0.0	42,600	38	1.00%	78%	0.30	0.05	0.0	0	0	1.535%	78%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.05	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-20	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	42,600	38	1.00%	85%	0.33	0.06	0.0	0	0	1.535%	85%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Improved Blasting Methods Combo#1

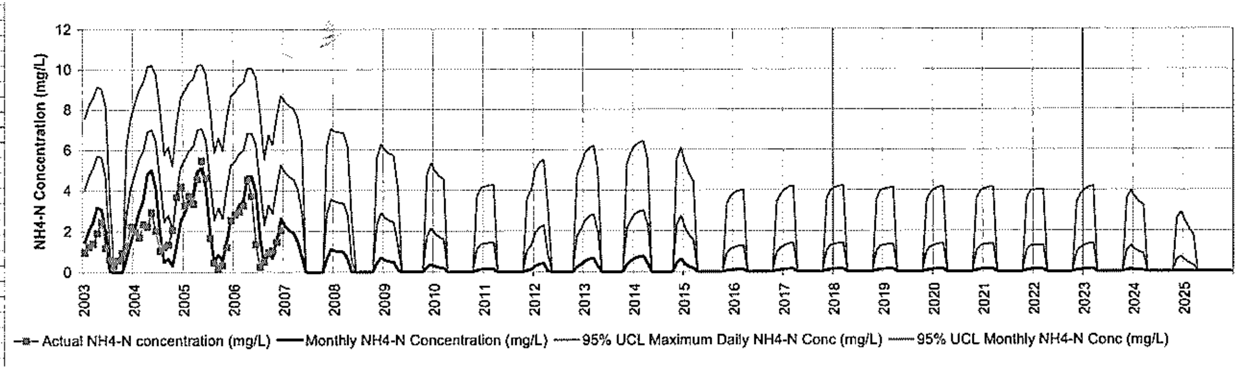
	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Sep-20	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	42,600	38	1.00%	118%	0.45	0.08	0.1	0	0	1.535%	118%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-20	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	42,600	38	1.00%	91%	0.35	0.06	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.06	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-20	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	42,600	38	1.00%	91%	0.35	0.06	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.06	0.0	0.1	0.0	0.03	0.03	0.02	0.45	0.63	2.72	
Dec-20	700	0	1.535%	100%	0.00	0.00	0.0		500	0	1.00%	100%	0.00	0.00	0.0	42,600	38	1.00%	100%	0.38	0.07	0.1	0	0	1.535%	100%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.02	0.03	0.07	0.0	0.1	0.0	0.05	0.05	0.04	0.58	0.78	3.05	
Jan-21	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	46,800	40	1.00%	85%	0.34	0.06	0.0	0	0	1.535%	85%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.04	0.05	0.06	0.0	0.1	0.0	0.06	0.05	0.04	0.59	0.80	3.09	
Feb-21	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	46,800	40	1.00%	91%	0.36	0.06	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.04	0.05	0.06	0.0	0.1	0.0	0.06	0.05	0.04	0.61	0.82	3.13	
Mar-21	700	0	1.535%	89%	0.00	0.00	0.0		500	0	1.00%	89%	0.00	0.00	0.0	46,800	40	1.00%	89%	0.36	0.06	0.0	0	0	1.535%	89%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.04	0.05	0.06	0.0	0.1	0.0	0.06	0.05	0.04	0.62	0.82	3.14	
Apr-21	700	0	1.535%	127%	0.00	0.00	0.0		500	0	1.00%	127%	0.00	0.00	0.0	46,800	40	1.00%	127%	0.51	0.09	0.1	0	0	1.535%	127%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.04	0.05	0.09	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-21	700	0	1.535%	125%	0.00	0.00	0.0		500	0	1.00%	125%	0.00	0.00	0.0	46,800	40	1.00%	125%	0.50	0.09	0.1	0	0	1.535%	125%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.09	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-21	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	46,800	40	1.00%	118%	0.47	0.08	0.1	0	0	1.535%	118%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-21	700	0	1.535%	78%	0.00	0.00	0.0		500	0	1.00%	78%	0.00	0.00	0.0	46,800	40	1.00%	78%	0.31	0.06	0.0	0	0	1.535%	78%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-21	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	46,800	40	1.00%	85%	0.34	0.06	0.0	0	0	1.535%	85%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-21	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	46,800	40	1.00%	118%	0.47	0.08	0.1	0	0	1.535%	118%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-21	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	46,800	40	1.00%	91%	0.36	0.06	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.06	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-21	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	46,800	40	1.00%	91%	0.36	0.06	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.06	0.0	0.1	0.0	0.03	0.03	0.02	0.45	0.63	2.72	
Dec-21	700	0	1.535%	100%	0.00	0.00	0.0		500	0	1.00%	100%	0.00	0.00	0.0	46,800	40	1.00%	100%	0.40	0.07	0.0	0	0	1.535%	100%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.02	0.03	0.07	0.0	0.1	0.0	0.05	0.05	0.04	0.57	0.77	3.04	
Jan-22	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	42,200	32	1.00%	85%	0.27	0.05	0.0	0	0	1.535%	85%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.04	0.05	0.05	0.0	0.1	0.0	0.05	0.05	0.04	0.57	0.77	3.03	
Feb-22	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	42,200	32	1.00%	91%	0.29	0.05	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.04	0.05	0.05	0.0	0.1	0.0	0.05	0.05	0.04	0.58	0.78	3.05	
Mar-22	700	0	1.535%	89%	0.00	0.00	0.0		500	0	1.00%	89%	0.00	0.00	0.0	42,200	32	1.00%	89%	0.28	0.05	0.0	0	0	1.535%	89%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.04	0.05	0.05	0.0	0.1	0.0	0.05	0.05	0.04	0.58	0.78	3.05	
Apr-22	700	0	1.535%	127%	0.00	0.00	0.0		500	0	1.00%	127%	0.00	0.00	0.0	42,200	32	1.00%	127%	0.40	0.07	0.1	0	0	1.535%	127%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.04	0.05	0.07	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-22	700	0	1.535%	125%	0.00	0.00	0.0		500	0	1.00%	125%	0.00	0.00	0.0	42,200	32	1.00%	125%	0.40	0.07	0.1	0	0	1.535%	125%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.07	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-22	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	42,200	32	1.00%	118%	0.37	0.07	0.1	0	0	1.535%	118%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.07	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-22	700	0	1.535%	78%	0.00	0.00	0.0		500	0	1.00%	78%	0.00	0.00	0.0	42,200	32	1.00%	78%	0.25	0.04	0.0	0	0	1.535%	78%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.04	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-22	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	42,200	32	1.00%	85%	0.27	0.05	0.0	0	0	1.535%	85%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.05	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-22	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	42,200	32	1.00%	118%	0.37	0.07	0.1	0	0	1.535%	118%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.07	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-22	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	42,200	32	1.00%	91%	0.29	0.05	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.05	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-22	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	42,200	32	1.00%	91%	0.29	0.05	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.05	0.0	0.1	0.0	0.03	0.02	0.02	0.41	0.58	2.60	
Dec-22	700	0	1.535%	100%	0.00	0.00	0.0		500	0	1.00%	100%	0.00	0.00	0.0	42,200	32	1.00%	100%	0.32	0.06	0.0	0	0	1.535%	100%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.02	0.02	0.06	0.0	0.1	0.0	0.04	0.04	0.03	0.52	0.72	2.92	
Jan-23	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	37,700	35	1.00%	85%	0.30	0.05	0.0	0	0	1.535%	85%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.03	0.04	0.05	0.0	0.1	0.0	0.04	0.05	0.04	0.58	0.78	3.05	
Feb-23	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	37,700	35	1.00%	91%	0.32	0.06	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.04	0.05	0.06	0.0	0.1	0.0	0.05	0.05	0.04	0.62	0.82	3.14	
Mar-23	700	0	1.535%	89%	0.00	0.00	0.0		500	0	1.00%	89%	0.00	0.00	0.0	37,700	35	1.00%	89%	0.31	0.06	0.0	0	0	1.535%	89%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.04	0.05	0.06	0.0	0.1	0.0	0.05	0.06	0.04	0.63	0.84	3.18	
Apr-23	700	0	1.535%	127%	0.00	0.00	0.0		500	0	1.00%	127%	0.00	0.00	0.0	37,700	35	1.00%	127%	0.45	0.08	0.1	0	0	1.535%	127%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.04	0.06	0.08	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-23	700	0	1.535%	125%	0.00	0.00	0.0		500	0	1.00%	125%	0.00	0.00	0.0	37,700	35	1.00%	125%	0.44	0.08	0.1	0	0	1.535%	125%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.08	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-23	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	37,700	35	1.00%	118%	0.41	0.07	0.1	0	0	1.535%	118%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.07	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-23	700	0	1.535%	78%	0.00	0.00	0.0		500	0	1.00%	78%	0.00	0.00	0.0	37,700	35	1.00%	78%	0.27	0.05	0.0	0	0	1.535%	78%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.05	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-23	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	37,700	35	1.00%	85%	0.30	0.05	0.0	0	0	1.535%	85%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.05	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-23	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	37,700	35	1.00%	118%	0.41	0.07	0.1	0	0	1.535%	118%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.07	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-23	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	37,700	35	1.00%	91%	0.32	0.06	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.06	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-23	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	37,700	35	1.00%	91%	0.32	0.06	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.06	0.0	0.1	0.0	0.03	0.03	0.02	0.44	0.62	2.70	
Dec-23	700	0	1.535%	100%	0.00	0.00	0.0		500	0	1.00%	100%	0.00	0.00	0.0	37,700	35	1.00%	100%	0.35	0.06	0.1	0	0	1.535%	100%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.02	0.03	0.06	0.0	0.1	0.0	0.04	0.05	0.04	0.57	0.77	3.04	
Jan-24	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	38,300	10	1.00%	85%	0.09	0.02	0.0	0	0	1.535%	85%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.04	0.05	0.02	0.0	0.1	0.0	0.03	0.03	0.03	0.46	0.65	2.76	
Feb-24	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	38,300	10	1.00%	91%	0.09	0.02	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.03	0.03	0.02	0.0	0.0	0.0	0.02	0.02	0.02	0.40	0.58	2.59	
Mar-24	700	0	1.535%	89%	0.00	0.00	0.0		500	0	1.00%	89%	0.00	0.00	0.0	38,300	10	1.00%	89%	0.09	0.02	0.0	0	0	1.535%	89%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.02	0.02	0.02	0.0	0.0	0.0	0.02	0.02	0.02	0.36	0.53	2.48	
Apr-24	700	0	1.535%	127%	0.00	0.00	0.0		500	0	1.00%	127%	0.00	0.00	0.0	38,300	10	1.00%	127%	0.13	0.02	0.0	0	0	1.535%	127%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.02	0.02	0.02	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-24	700	0	1.535%	125%	0.00	0.00	0.0		500	0	1.00%	125%	0.00	0.00	0.0	38,300	10	1.00%	125%	0.13	0.02	0.0	0	0	1.535%	125%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.02	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-24	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	38,300	10	1.00%	118%	0.12	0.02	0.0	0	0	1.535%	118%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.02	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-24	700	0	1.535%	78%	0.00	0.00	0.0		500	0	1.00%	78%	0.00	0.00	0.0	38,300	10	1.00%	78%	0.08	0.01	0.0	0	0	1.535%	78%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.01	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-24	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	38,300	10	1.00%	85%	0.09	0.02	0.0	0	0	1.535%	85%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.02	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-24	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	38,300	10	1.00%	118%	0.12	0.02	0.0	0	0	1.535%	118%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.02	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-24	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	38,300	10	1.00%	91%	0.09	0.02	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.02	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-24	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	38,300	10	1.00%	91%	0.09	0.02	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.02	0.0	0.0	0.0	0.01	0.01	0.01	0.22	0.35	1.98	
Dec-24	700	0	1.535%	100%	0.00	0.00	0.0		500	0	1.00%	100%	0.00	0.00	0.0	38,300	10	1.00%	100%	0.10	0.02	0.0	0	0	1.535%	100%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.01	0.01	0.02	0.0	0.0	0.0	0.01	0.01	0.01	0.29	0.44	2.23	
Jan-25	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	38,900	0	1.00%	85%	0.00	0.00	0.0	0	0	1.535%	85%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.01	0.01	0.00	0.0	0.0	0.0	0.01	0.01	0.01	0.20	0.32	1.88	

WLWB Ammonia Model - Improved Blasting Methods Combo#1

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Feb-25	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	38,900	0	1.00%	91%	0.00	0.00	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.01	0.01	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.14	0.24	1.59	
Mar-25	700	0	1.535%	89%	0.00	0.00	0.0		500	0	1.00%	89%	0.00	0.00	0.0	38,900	0	1.00%	89%	0.00	0.00	0.0	0	0	1.535%	89%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.09	0.18	1.34	
Apr-25	700	0	1.535%	127%	0.00	0.00	0.0		500	0	1.00%	127%	0.00	0.00	0.0	38,900	0	1.00%	127%	0.00	0.00	0.0	0	0	1.535%	127%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-25	700	0	1.535%	125%	0.00	0.00	0.0		500	0	1.00%	125%	0.00	0.00	0.0	38,900	0	1.00%	125%	0.00	0.00	0.0	0	0	1.535%	125%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-25	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	38,900	0	1.00%	118%	0.00	0.00	0.0	0	0	1.535%	118%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-25	700	0	1.535%	78%	0.00	0.00	0.0		500	0	1.00%	78%	0.00	0.00	0.0	38,900	0	1.00%	78%	0.00	0.00	0.0	0	0	1.535%	78%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-25	700	0	1.535%	85%	0.00	0.00	0.0		500	0	1.00%	85%	0.00	0.00	0.0	38,900	0	1.00%	85%	0.00	0.00	0.0	0	0	1.535%	85%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-25	700	0	1.535%	118%	0.00	0.00	0.0		500	0	1.00%	118%	0.00	0.00	0.0	38,900	0	1.00%	118%	0.00	0.00	0.0	0	0	1.535%	118%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-25	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	38,900	0	1.00%	91%	0.00	0.00	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-25	700	0	1.535%	91%	0.00	0.00	0.0		500	0	1.00%	91%	0.00	0.00	0.0	38,900	0	1.00%	91%	0.00	0.00	0.0	0	0	1.535%	91%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-25	700	0	1.535%	100%	0.00	0.00	0.0		500	0	1.00%	100%	0.00	0.00	0.0	38,900	0	1.00%	100%	0.00	0.00	0.0	0	0	1.535%	100%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

CASE:	**Improved Blasting Methods - Combo #2**
BLASTING:	Combo#2: Double prime, improve loading, 80/20 emulsion/ANFO mix; thick emulsion; reduced residence time; PE liner in wet holes; improve stemming (55% average reduction, 70% peak)
AN USE:	Past and future use as per Diavik ADP projections (SNC-Lavalin, Ammonia Balance, May 2006)
MINE INFLOW:	Actual to present, predicted inflows (Golder, 2006) in future.
WATER MANAGEMENT:	All mine water discharged to North Inlet
TREATMENT:	No additional treatment; natural biological degradation in North Inlet to continue at current rate.
FLOW TO LAC DE GRAS:	Actual to present, future discharge equal to input in same month.

RESULTS	**FROM BEGINNING OF**	**03**	**07**	**08**
AMMONIA (N) TO LDG	**TO END OF**	**06**	**07**	**25**
	Average	2.3	0.9	0.1
	Maximum 30 Day	5.1	2.3	1.0
	Maximum 1 Day	8.6	5.5	3.6
	Maximum 95% UCL 30 Day	7.1	4.9	3.4
	Maximum 95% UCL 1 Day	10.3	8.4	6.9



WLWB Ammonia Model - Improved Blasting Methods Combo#2

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Jan-03	5,380	867	0.924%	60%	4.80	0.85	5.2	8.4	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	5380	1.41	32000	17,905	1.00	1.25	0.85	0.0	2.1	1.5	0.81	1.29	1.49	4.35	4.06	7.57	1.0
Feb-03	5,667	867	0.924%	75%	6.00	1.06	6.2	7.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	5667	1.42	32000	17,175	1.49	1.86	1.06	0.0	2.9	2.1	1.07	1.85	2.05	5.20	4.70	8.20	1.3
Mar-03	5,954	867	0.924%	70%	5.60	0.99	5.5	5.1	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	5954	1.43	32000	16,854	2.05	2.57	0.99	0.0	3.6	2.5	1.28	2.29	2.49	5.78	5.12	8.60	1.4
Apr-03	6,251	867	0.924%	175%	14.01	2.48	13.0	10.5	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	1.25	6251	1.44	32000	16,875	2.49	3.11	2.48	1.0	4.6	3.2	1.64	2.96	3.19	6.62	5.73	9.14	1.9
May-03	5,936	867	0.924%	170%	13.61	2.41	13.3	5.4	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	1.25	5936	1.43	32000	25,514	3.19	3.99	2.41	2.0	4.4	3.1	2.39	2.01	3.07	6.49	5.64	9.06	2.5
Jun-03	7,290	867	0.924%	150%	12.01	2.13	9.6	3.2	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	7290	1.47	32000	29,485	3.07	3.84	2.13	3.0	3.0	2.0	1.81	1.16	2.02	5.15	4.66	8.16	1.2
Jul-03	6,867	867	0.924%	40%	3.20	0.57	2.7	6.7	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	6867	1.46	32000	28,379	2.02	2.52	0.57	3.0	0.1	0.1	0.05	0.04	0.06	0.76	0.98	3.45	0.6
Aug-03	7,753	867	0.924%	60%	4.80	0.85	3.6	6.1	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	7753	1.49	32000	27,138	0.06	0.08	0.85	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.2
Sep-03	8,194	867	0.924%	150%	12.01	2.13	8.5	8.4	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	8194	1.50	32000	29,865	0.00	0.00	2.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.6
Oct-03	8,775	867	0.924%	75%	6.00	1.06	4.0	6.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	8775	1.52	32000	27,977	0.00	0.00	1.06	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.9
Nov-03	8,935	867	0.924%	75%	6.00	1.06	3.9	6.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	8935	1.52	32000	15,411	0.00	0.00	1.06	0.0	1.1	0.7	0.33	0.74	0.70	2.87	2.89	6.28	1.3
Dec-03	8,301	867	0.924%	100%	8.01	1.42	5.6	5.1	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	8301	1.50	32000	24,385	0.70	0.87	1.42	0.0	2.3	1.5	1.13	1.16	1.53	4.42	4.11	7.62	2.2
Jan-04	8,570	808	1.598%	60%	7.75	1.37	5.3	4.3	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	8570	1.51	32000	13,372	1.53	1.91	1.37	0.0	3.3	2.2	0.88	2.40	2.17	5.36	4.82	8.31	2.0
Feb-04	7,982	808	1.598%	75%	9.69	1.72	7.1	5.9	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	7982	1.49	32000	7,407	2.17	2.71	1.72	0.0	4.4	3.0	0.67	3.76	2.97	6.37	5.55	8.98	1.7
Mar-04	8,828	808	1.598%	70%	9.04	1.60	6.0	6.0	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	8828	1.52	32000	3,826	2.97	3.71	1.60	0.0	5.3	3.5	0.41	4.91	3.50	6.97	5.97	9.35	2.4
Apr-04	9,324	808	1.598%	175%	22.60	4.00	14.1	5.3	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	1.25	9324	1.53	32000	0	3.50	4.37	4.00	1.0	7.4	4.8	0.00	7.38	4.81	8.30	6.89	10.12	2.2
May-04	10,755	808	1.598%	170%	21.95	3.89	11.9	9.3	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	1.25	10755	1.58	32000	0	4.81	6.01	3.89	2.0	7.9	5.0	0.00	7.90	5.01	8.49	7.02	10.22	2.9
Jun-04	12,337	808	1.598%	150%	19.37	3.43	9.1	5.3	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	12337	1.63	32000	16,027	5.01	6.26	3.43	3.0	6.7	4.1	2.01	4.69	4.12	7.63	6.43	9.74	2.0
Jul-04	11,098	808	1.598%	40%	5.17	0.92	2.7	13.4	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	11098	1.59	32000	25,310	4.12	5.15	0.92	3.0	3.1	1.9	1.49	1.58	1.93	5.03	4.57	8.07	1.1
Aug-04	11,394	808	1.598%	60%	7.75	1.37	4.0	8.9	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	11394	1.60	32000	28,658	1.93	2.41	1.37	3.0	0.8	0.5	0.43	0.36	0.49	2.37	2.47	5.76	1.2
Sep-04	12,030	808	1.598%	150%	19.37	3.43	9.4	6.7	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	12030	1.62	32000	27,577	0.49	0.62	3.43	3.0	1.0	0.6	0.54	0.50	0.65	2.76	2.80	6.17	1.3
Oct-04	11,948	808	1.598%	75%	9.69	1.72	4.7	6.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11948	1.61	32000	13,563	0.65	0.81	1.72	2.0	0.5	0.3	0.14	0.39	0.33	1.89	2.06	5.20	2.1
Nov-04	11,300	808	1.598%	75%	9.69	1.72	5.0	7.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11300	1.59	32000	12,590	0.33	0.41	1.72	0.0	2.1	1.3	0.51	1.61	1.33	4.10	3.87	7.37	3.7
Dec-04	10,514	808	1.598%	100%	12.91	2.29	7.2	5.1	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	10514	1.57	32000	11,561	1.33	1.67	2.29	0.0	4.0	2.5	0.89	3.07	2.52	5.82	5.15	8.62	4.2
Jan-05	10,958	725	1.979%	60%	8.61	1.53	4.6	4.5	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	10958	1.58	32000	10,692	2.52	3.15	1.53	0.0	4.7	3.0	0.96	3.72	2.95	6.35	5.53	8.97	3.3
Feb-05	11,359	725	1.979%	75%	10.76	1.91	5.5	4.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11359	1.60	32000	12,385	2.95	3.69	1.91	0.0	5.6	3.5	1.32	4.28	3.51	6.98	5.98	9.36	3.7
Mar-05	12,270	725	1.979%	70%	10.04	1.78	4.8	5.8	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	12270	1.62	32000	12,748	3.51	4.39	1.78	0.0	6.2	3.8	1.47	4.69	3.80	7.29	6.20	9.55	3.4
Apr-05	13,110	725	1.979%	175%	25.11	4.45	11.2	11.5	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	1.25	13110	1.65	32000	13,667	3.80	4.75	4.45	1.0	8.2	5.0	2.07	6.13	4.97	8.46	7.00	10.20	4.6
May-05	14,120	725	1.979%	170%	24.39	4.32	10.1	11.7	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	1.25	14120	1.68	32000	16,000	4.97	6.22	4.32	2.0	8.5	5.1	2.47	6.06	5.08	8.56	7.07	10.26	5.5
Jun-05	15,045	725	1.979%	150%	21.52	3.81	8.3	10.7	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	15045	1.71	32000	17,531	5.08	6.35	3.81	3.0	7.2	4.2	2.24	4.93	4.20	7.70	6.48	9.79	4.6
Jul-05	15,261	725	1.979%	40%	5.74	1.02	2.2	5.1	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	15261	1.71	32000	8,477	4.20	5.25	1.02	3.0	3.3	1.9	0.49	2.77	1.90	4.99	4.54	8.05	1.7
Aug-05	14,863	725	1.979%	60%	8.61	1.53	3.4	3.3	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	14863	1.70	32000	17,738	1.90	2.38	1.53	3.0	0.9	0.5	0.29	0.62	0.53	2.48	2.56	5.87	0.5
Sep-05	15,820	725	1.979%	150%	21.52	3.81	7.9	2.2	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	15820	1.73	32000	24,395	0.53	0.67	3.81	3.0	1.5	0.9	0.63	0.85	0.86	3.21	3.17	6.60	0.2
Oct-05	15,681	725	1.979%	75%	10.76	1.91	4.0	2.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15681	1.73	32000	21,915	0.86	1.07	1.91	2.0	1.0	0.6	0.38	0.60	0.57	2.56	2.63	5.96	0.3
Nov-05	15,693	725	1.979%	75%	10.76	1.91	4.0	3.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15693	1.73	32000	17,253	0.57	0.71	1.91	0.0	2.6	1.5	0.79	1.82	1.51	4.40	4.10	7.60	1.2
Dec-05	14,884	725	1.979%	100%	14.35	2.54	5.6	6.3	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	14884	1.70	32000	14,961	1.51	1.89	2.54	0.0	4.4	2.6	1.19	3.25	2.60	5.92	5.23	8.69	2.6
Jan-06	15,584	642	2.256%	60%	8.69	1.54	3.2	3.7	250	0	0.000%	60%	0.00	0.00	0.0	0	46	2.94%	60%	0.81	0.14	#DIV/0!	0	0	0.00%	60%	0.00	0.00	0.0	1.25	15834	1.73	32000	15,041	2.60	3.26	1.68	0.0	4.9	2.9	1.30	3.63	2.85	6.23	5.45	8.89	2.8
Feb-06	15,104	642	2.256%	75%	10.86	1.92	4.2	4.8	250	0	0.000%	75%	0.00	0.00	0.0	0	46	2.94%	75%	1.01	0.18	#DIV/0!	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15354	1.72	32000	15,114	2.85	3.56	2.10	0.0	5.7	3.3	1.52	4.15	3.30	6.75	5.82	9.22	3.0
Mar-06	15,618	642	2.256%	70%	10.14	1.80	3.8	3.1	250	0	0.000%	70%	0.00	0.00	0.0	0	46	2.94%	70%	0.94	0.17	#DIV/0!	0	0	0.00%	70%	0.00	0.00	0.0	1.25	15868	1.73	32000	19,356	3.30	4.13	1.96	0.0	6.1	3.5	2.07	4.02	3.51	6.99	5.99	9.36	3.3
Apr-06	16,453	642	2.256%	175%	25.34	4.49	9.0	9.6	250	0	0.000%	175%	0.00	0.00	0.0	0	46	2.94%	175%	2.35	0.42	#DIV/0!	0	0	0.00%	175%	0.00	0.00	0.0	1.25	16703	1.76	32000	17,439	3.51	4.39	4.91	1.0	8.3	4.7	2.50	5.80	4.72	8.22	6.84	10.07	4.6
May-06	19,475	642	2.256%	170%	24.61	4.36	7.4	5.3	250	0	0.000%	170%	0.00	0.00	0.0	0	46	2.94%	170%	2.28	0.40	#DIV/0!	0	0	0.00%	170%	0.00	0.00	0.0	1.25	19725	1.85	32000	20,203	4.72	5.90	4.77	2.0	8.7	4.7	2.88	5.79	4.69	8.18	6.81	10.06	3.7
Jun-06	18,310	642	2.256%	150%	21.72	3.85	6.9	3.4	250	0	0.000%	150%	0.00	0.00	0.0	22	46	2.94%	150%	2.01	0.36	531.3	0	0	0.00%	150%	0.00	0.00	0.0	1.25	18582	1.82	32000	27,717	4.69	5.86	4.21	3.0	7.1	3.9	3.28	3.78	3.89	7.39	6.27	9.60	1.4
Jul-06	17,677	642	2.256%	40%	5.79	1.03	1.9	4.4	250	0	0.000%	40%	0.00	0.00	0.0	40	46	2.94%	40%	0.54	0.10	77.3	0	0	0.00%	40%	0.00	0.00	0.0	1.25	17967	1.80	32000	22,154	3.89	4.86	1.12	3.0	3.0	1.7	1.12	1.87	1.66	4.63	4.27	7.78	0.2
Aug-06	18,560	642	2.256%	60%	8.69	1.54	2.7	7.3	250	0	0.000%	60%	0.00	0.00	0.0	38	46	2.94%	60%	0.81	0.14	122.6	0	0	0.00%	60%	0.00	0.00	0.0	1.25	18849	1.82	32000	18,801	1.66	2.08	1.68	3.0	0.8	0.4	0.24	0.52	0.42	2.16	2.29	5.52	0.5
Sep-06	19,176	642	2.256%	150%	21.72	3.85	6.6	5.4	250	0	0.000%	150%	0.00	0.00	0.0	154	46	2.94%	150%	2.01	0.36	76.1	0	0	0.00%	150%	0.00	0.00	0.0	1.25	19580	1.85	32000	25,748	0.42	0.52	4.21	3.0	1.7	0.9	0.73	0.99	0.94	3.37	3.30	6.75	1.0
Oct-06	18,487	642	2.256%	75%	10.86	1.92	3.4	3.7	250	0	0.000%	75%	0.00	0.00	0.0	430	46	2.94%	75%	1.01	0.18	13.6	0	0	0.00%	75%	0.00	0.00	0.0	1.25	19166	1.83	32000	26,010	0.94	1.17	2.10	2.0	1.3	0.7	0.55	0.72	0.69	2.86	2.88	6.27	1.1
Nov-06	19,635	642	2.256%	75%	10.86	1.92	3.2	2.4	250	0	0.000%	75%	0.00	0.00	0.0	687	46	2.94%	75%	1.01	0.18	8.5	0	0	0.00%	75%	0.00	0.00	0.0	1.25	20572	1.88	32000	23,981	0.69	0.87	2.10	0.0	3.0	1.6	1.16	1.82	1.58	4.51	4.18	7.69	1.5
Dec-06	17,652	642	2.256%	100%	14.48	2.57	4.8	4.5	250	0	0.000%	100%	0.00	0.00	0.0	929	46	2.94%	100%	1.34	0.24	8.4	0	0	0.00%	100%	0.00	0.00	0.0	1.25	18831	1.82	32000	19,976	1.58	1.98	2.80	0.0	4.8	2.6	1.59	3.19	2.62	5.95	5.25	8.71	2.1
Jan-07	17,200	408	1.256%	91%	4.67	0.83	1.6		500	400	0.500%	91%	1.82	0.32	21.2	8,200	33	2.94%	91%	0.87	0.15	0.6	0	0	1.26%	91%	0.00	0.00	0.0	1.25	25900	2.04	32000	25,900	2.62	3.28	1.30	0.0	4.6	2.3	1.77	2.81	2.25	5.47	4.90	8.39	
Feb-07	17,200	408	1.256%	94%	4.84	0.86	1.6		500	400	0.500%	94%	1.89	0.33	22.0	8,200	33	2.94%	94%	0.90	0.16	0.6	0	0	1.26%	94%	0.00	0.00	0.0	1.25	25900	2.04	32000	25,900	2.25	2.81	1.35	0.0	4.2	2.0	1.61	2.56	2.04	5.19	4.69	8.19	
Mar-07	17,200	408	1.256%	93%	4.78	0.85	1.6		500	400	0.500%	93%	1.87	0.33	21.7	8,200	33	2.94%	93%	0.89	0.16	0.6	0	0	1.26%	93%	0.00	0.00	0.0	1.25	25900	2.04	32000	25,900	2.04	2.56	1.34	0.0	3.9	1.9	1.50	2.39	1.91	5.00	4.55	8.05	
Apr-07	17,200	408	1.256%	117%	5.98	1.06	2.0		500	400	0.500%	117%	2.33	0.41	27.2	8,200	33	2.94%	117%	1.11	0.20	0.8	0	0	1.26%	117%	0.00	0.00	0.0	1.25	25900	2.04	32000	25,900	1.91	2.39	1.67	1.0	3.1	1.5	1.18	1.88	1.50	4.38	4.08	7.59	
May-07	17,200	408	1.256%	116%	5.92	1.05	2.0		500	400	0.500%	116%	2.31	0.41	26.9	8,200	33	2.94%	116%	1.10	0.20	0.8	0	0	1.26%	116%	0.00	0.00	0.0	1.25	25900	2.04	45000	25,900	1.50	1.88	1.66	2.0	1.5	0.8	0.59	0.94	0.75	2.99	2.99	6.39	

WLWB Ammonia Model - Improved Blasting Methods Combo#2

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Jun-07	17,200	408	1.256%	111%	5.70	1.01	1.9		500	400	0.500%	111%	2.22	0.39	25.9	8,200	33	2.94%	111%	1.06	0.19	0.8	0	0	1.26%	111%	0.00	0.00	0.0	1.25	25900	2.04	45000	25,900	0.75	0.94	1.59	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-07	17,200	408	1.256%	87%	4.44	0.79	1.5		500	400	0.500%	87%	1.73	0.31	20.2	8,200	33	2.94%	87%	0.83	0.15	0.6	0	0	1.26%	87%	0.00	0.00	0.0	1.25	25900	2.04	45000	25,900	0.00	0.00	1.24	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-07	17,200	408	1.256%	91%	4.67	0.83	1.6		500	400	0.500%	91%	1.82	0.32	21.2	8,200	33	2.94%	91%	0.87	0.15	0.6	0	0	1.26%	91%	0.00	0.00	0.0	1.25	25900	2.04	45000	25,900	0.00	0.00	1.30	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-07	17,200	408	1.256%	111%	5.70	1.01	1.9		500	400	0.500%	111%	2.22	0.39	25.9	8,200	33	2.94%	111%	1.06	0.19	0.8	0	0	1.26%	111%	0.00	0.00	0.0	1.25	25900	2.04	45000	25,900	0.00	0.00	1.59	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-07	17,200	408	1.256%	94%	4.84	0.86	1.6		500	400	0.500%	94%	1.89	0.33	22.0	8,200	33	2.94%	94%	0.90	0.16	0.6	0	0	1.26%	94%	0.00	0.00	0.0	1.25	25900	2.04	45000	25,900	0.00	0.00	1.35	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-07	17,200	408	1.256%	94%	4.84	0.86	1.6		500	400	0.500%	94%	1.89	0.33	22.0	8,200	33	2.94%	94%	0.90	0.16	0.6	0	0	1.26%	94%	0.00	0.00	0.0	1.25	25900	2.04	45000	25,900	0.00	0.00	1.35	0.0	1.4	0.7	0.52	0.83	0.66	2.79	2.83	6.20	
Dec-07	17,200	408	1.256%	100%	5.13	0.91	1.7		500	400	0.500%	100%	2.00	0.35	23.3	8,200	33	2.94%	100%	0.96	0.17	0.7	0	0	1.26%	100%	0.00	0.00	0.0	1.25	25900	2.04	45000	25,900	0.66	0.83	1.43	0.0	2.3	1.1	0.87	1.39	1.11	3.71	3.56	7.04	
Jan-08	8,950	90	1.256%	91%	1.03	0.18	0.7		500	808	0.500%	91%	3.68	0.65	42.9	24,600	28	2.94%	91%	0.76	0.13	0.2	0	0	1.26%	91%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	1.11	1.39	0.97	0.0	2.4	1.0	1.07	1.29	1.03	3.56	3.45	6.91	
Feb-08	8,950	90	1.256%	94%	1.07	0.19	0.7		500	808	0.500%	94%	3.82	0.68	44.4	24,600	28	2.94%	94%	0.79	0.14	0.2	0	0	1.26%	94%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	1.03	1.29	1.00	0.0	2.3	1.0	1.04	1.25	1.00	3.51	3.41	6.87	
Mar-08	8,950	90	1.256%	93%	1.05	0.19	0.7		500	808	0.500%	93%	3.77	0.67	43.9	24,600	28	2.94%	93%	0.78	0.14	0.2	0	0	1.26%	93%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	1.00	1.25	0.99	0.0	2.2	1.0	1.02	1.23	0.98	3.47	3.37	6.83	
Apr-08	8,950	90	1.256%	117%	1.32	0.23	0.9		500	808	0.500%	117%	4.72	0.84	54.9	24,600	28	2.94%	117%	0.97	0.17	0.2	0	0	1.26%	117%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	0.98	1.23	1.24	1.0	1.5	0.6	0.67	0.80	0.64	2.75	2.79	6.15	
May-08	8,950	90	1.256%	116%	1.31	0.23	0.8		500	808	0.500%	116%	4.67	0.83	54.4	24,600	28	2.94%	116%	0.96	0.17	0.2	0	0	1.26%	116%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	0.64	0.80	1.23	2.0	0.0	0.0	0.02	0.02	0.01	0.35	0.51	2.42	
Jun-08	8,950	90	1.256%	111%	1.26	0.22	0.8		500	808	0.500%	111%	4.49	0.80	52.3	24,600	28	2.94%	111%	0.93	0.16	0.2	0	0	1.26%	111%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	0.01	0.02	1.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-08	8,950	90	1.256%	87%	0.98	0.17	0.6		500	808	0.500%	87%	3.50	0.62	40.8	24,600	28	2.94%	87%	0.72	0.13	0.2	0	0	1.26%	87%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	0.00	0.00	0.92	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-08	8,950	90	1.256%	91%	1.03	0.18	0.7		500	808	0.500%	91%	3.68	0.65	42.9	24,600	28	2.94%	91%	0.76	0.13	0.2	0	0	1.26%	91%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	0.00	0.00	0.97	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-08	8,950	90	1.256%	111%	1.26	0.22	0.8		500	808	0.500%	111%	4.49	0.80	52.3	24,600	28	2.94%	111%	0.93	0.16	0.2	0	0	1.26%	111%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	0.00	0.00	1.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-08	8,950	90	1.256%	94%	1.07	0.19	0.7		500	808	0.500%	94%	3.82	0.68	44.4	24,600	28	2.94%	94%	0.79	0.14	0.2	0	0	1.26%	94%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	0.00	0.00	1.00	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-08	8,950	90	1.256%	94%	1.07	0.19	0.7		500	808	0.500%	94%	3.82	0.68	44.4	24,600	28	2.94%	94%	0.79	0.14	0.2	0	0	1.26%	94%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	0.00	0.00	1.00	0.0	1.0	0.4	0.46	0.55	0.44	2.23	2.35	5.60	
Dec-08	8,950	90	1.256%	100%	1.13	0.20	0.7		500	808	0.500%	100%	4.04	0.72	47.1	24,600	28	2.94%	100%	0.83	0.15	0.2	0	0	1.26%	100%	0.00	0.00	0.0	1.25	34050	2.29	45000	34,050	0.44	0.55	1.06	0.0	1.6	0.7	0.73	0.88	0.71	2.89	2.91	6.29	
Jan-09	700	0	1.256%	91%	0.00	0.00	0.0		500	600	0.500%	91%	2.73	0.48	31.8	40,900	18	2.94%	91%	0.47	0.08	0.1	0	0	1.26%	91%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.71	0.88	0.57	0.0	1.4	0.6	0.73	0.72	0.57	2.58	2.65	5.98	
Feb-09	700	0	1.256%	94%	0.00	0.00	0.0		500	600	0.500%	94%	2.83	0.50	33.0	40,900	18	2.94%	94%	0.49	0.09	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.57	0.72	0.59	0.0	1.3	0.5	0.66	0.64	0.52	2.43	2.52	5.82	
Mar-09	700	0	1.256%	93%	0.00	0.00	0.0		500	600	0.500%	93%	2.80	0.50	32.6	40,900	18	2.94%	93%	0.48	0.09	0.1	0	0	1.26%	93%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.52	0.64	0.58	0.0	1.2	0.5	0.62	0.61	0.48	2.35	2.45	5.73	
Apr-09	700	0	1.256%	117%	0.00	0.00	0.0		500	600	0.500%	117%	3.50	0.62	40.8	40,900	18	2.94%	117%	0.60	0.11	0.1	0	0	1.26%	117%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.48	0.61	0.73	1.0	0.3	0.1	0.17	0.16	0.13	1.15	1.36	4.15	
May-09	700	0	1.256%	116%	0.00	0.00	0.0		500	600	0.500%	116%	3.47	0.61	40.4	40,900	18	2.94%	116%	0.59	0.11	0.1	0	0	1.26%	116%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.13	0.16	0.72	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-09	700	0	1.256%	111%	0.00	0.00	0.0		500	600	0.500%	111%	3.33	0.59	38.8	40,900	18	2.94%	111%	0.57	0.10	0.1	0	0	1.26%	111%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.00	0.00	0.69	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-09	700	0	1.256%	87%	0.00	0.00	0.0		500	600	0.500%	87%	2.60	0.46	30.3	40,900	18	2.94%	87%	0.45	0.08	0.1	0	0	1.26%	87%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.00	0.00	0.54	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-09	700	0	1.256%	91%	0.00	0.00	0.0		500	600	0.500%	91%	2.73	0.48	31.8	40,900	18	2.94%	91%	0.47	0.08	0.1	0	0	1.26%	91%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.00	0.00	0.57	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-09	700	0	1.256%	111%	0.00	0.00	0.0		500	600	0.500%	111%	3.33	0.59	38.8	40,900	18	2.94%	111%	0.57	0.10	0.1	0	0	1.26%	111%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.00	0.00	0.69	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-09	700	0	1.256%	94%	0.00	0.00	0.0		500	600	0.500%	94%	2.83	0.50	33.0	40,900	18	2.94%	94%	0.49	0.09	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.00	0.00	0.59	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-09	700	0	1.256%	94%	0.00	0.00	0.0		500	600	0.500%	94%	2.83	0.50	33.0	40,900	18	2.94%	94%	0.49	0.09	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.00	0.00	0.59	0.0	0.6	0.2	0.30	0.29	0.23	1.57	1.76	4.78	
Dec-09	700	0	1.256%	100%	0.00	0.00	0.0		500	600	0.500%	100%	3.00	0.53	34.9	40,900	18	2.94%	100%	0.51	0.09	0.1	0	0	1.26%	100%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.23	0.29	0.62	0.0	0.9	0.4	0.46	0.45	0.36	2.00	2.15	5.33	
Jan-10	700	0	1.256%	91%	0.00	0.00	0.0		500	183	0.500%	91%	0.84	0.15	9.7	39,200	11	2.94%	91%	0.29	0.05	0.0	0	0	1.26%	91%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.36	0.45	0.20	0.0	0.7	0.3	0.32	0.33	0.26	1.68	1.86	4.93	
Feb-10	700	0	1.256%	94%	0.00	0.00	0.0		500	183	0.500%	94%	0.87	0.15	10.1	39,200	11	2.94%	94%	0.30	0.05	0.0	0	0	1.26%	94%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.26	0.33	0.21	0.0	0.5	0.2	0.27	0.27	0.22	1.51	1.71	4.70	
Mar-10	700	0	1.256%	93%	0.00	0.00	0.0		500	183	0.500%	93%	0.86	0.15	10.0	39,200	11	2.94%	93%	0.30	0.05	0.0	0	0	1.26%	93%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.22	0.27	0.20	0.0	0.5	0.2	0.24	0.24	0.19	1.41	1.62	4.56	
Apr-10	700	0	1.256%	117%	0.00	0.00	0.0		500	183	0.500%	117%	1.07	0.19	12.5	39,200	11	2.94%	117%	0.37	0.07	0.1	0	0	1.26%	117%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.19	0.24	0.26	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-10	700	0	1.256%	116%	0.00	0.00	0.0		500	183	0.500%	116%	1.06	0.19	12.3	39,200	11	2.94%	116%	0.37	0.07	0.1	0	0	1.26%	116%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.00	0.00	0.25	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-10	700	0	1.256%	111%	0.00	0.00	0.0		500	183	0.500%	111%	1.02	0.18	11.9	39,200	11	2.94%	111%	0.36	0.06	0.1	0	0	1.26%	111%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.00	0.00	0.24	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-10	700	0	1.256%	87%	0.00	0.00	0.0		500	183	0.500%	87%	0.79	0.14	9.3	39,200	11	2.94%	87%	0.28	0.05	0.0	0	0	1.26%	87%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.00	0.00	0.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-10	700	0	1.256%	91%	0.00	0.00	0.0		500	183	0.500%	91%	0.84	0.15	9.7	39,200	11	2.94%	91%	0.29	0.05	0.0	0	0	1.26%	91%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.00	0.00	0.20	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-10	700	0	1.256%	111%	0.00	0.00	0.0		500	183	0.500%	111%	1.02	0.18	11.9	39,200	11	2.94%	111%	0.36	0.06	0.1	0	0	1.26%	111%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.00	0.00	0.24	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-10	700	0	1.256%	94%	0.00	0.00	0.0		500	183	0.500%	94%	0.87	0.15	10.1	39,200	11	2.94%	94%	0.30	0.05	0.0	0	0	1.26%	94%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.00	0.00	0.21	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-10	700	0	1.256%	94%	0.00	0.00	0.0		500	183	0.500%	94%	0.87	0.15	10.1	39,200	11	2.94%	94%	0.30	0.05	0.0	0	0	1.26%	94%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.00	0.00	0.21	0.0	0.2	0.1	0.10	0.10	0.08	0.89	1.11	3.71	
Dec-10	700	0	1.256%	100%	0.00	0.00	0.0		500	183	0.500%	100%	0.92	0.16	10.7	39,200	11	2.94%	100%	0.32	0.06	0.0	0	0	1.26%	100%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.08	0.10	0.22	0.0	0.3	0.1	0.16	0.16	0.13	1.14	1.36	4.15	
Jan-11	700	0	1.256%	91%	0.00	0.00	0.0		500	23	0.500%	91%	0.11	0.02	1.2	37,400	33	2.94%	91%	0.87	0.15	0.1	0	0	1.26%	91%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.13	0.16	0.17	0.0	0.3	0.1	0.16	0.17	0.14	1.18	1.40	4.21	
Feb-11	700	0	1.256%	94%	0.00	0.00	0.0		500	23	0.500%	94%	0.11	0.02	1.3	37,400	33	2.94%	94%	0.90	0.16	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.14	0.17	0.18	0.0	0.4	0.1	0.17	0.18	0.15	1.21	1.43	4.26	
Mar-11	700	0	1.256%	93%	0.00	0.00	0.0		500	23	0.500%	93%	0.11	0.02	1.3	37,400	33	2.94%	93%	0.89	0.16	0.1	0	0	1.26%	93%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.15	0.18	0.18	0.0	0.4	0.1	0.17	0.19	0.15	1.22	1.44	4.28	
Apr-11	700	0	1.256%	117%	0.00	0.00	0.0		500	23	0.500%	117%	0.14	0.02	1.6	37,400	33	2.94%	117%	1.11	0.20	0.2	0	0	1.26%	117%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.15	0.19	0.22	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-11	700	0	1.256%	116%	0.00	0.00	0.0		500	23	0.500%	116%	0.13	0.02	1.6	37,400	33	2.94%	116%	1.10	0.20	0.2	0	0	1.26%	116%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.22	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-11	700	0	1.256%	111%	0.00	0.00	0.0		500	23	0.500%	111%	0.13	0.02	1.5	37,400	33	2.94%	111%	1.06	0.19	0.2	0	0	1.26%	111%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.21	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-11	700	0	1.256%	87%	0.00	0.00	0.0		500	23	0.500%	87%	0.10	0.02	1.2	37,400	33	2.94%	87%	0.83	0.15	0.1	0	0	1.26%	87%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.16	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-11	700	0	1.256%	91%	0.00	0.00	0.0		500	23	0.500%	91%	0.11	0.02	1.2	37,400	33	2.94%	91%	0.87	0.15	0.1	0	0	1.26%	91%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.17	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-11	700	0	1.256%	111%	0.00	0.00	0.0		500	23	0.500%	111%	0.13	0.02	1.5	37,400	33	2.94%	111%	1.06	0.19	0.2	0	0	1.26%	111%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.21	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-11	700	0	1.256%	94%	0.00	0.00	0.0		500	23	0.500%	94%	0.11	0.02	1.3	37,400	33	2.94%	94%	0.90	0.16	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.18	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Improved Blasting Methods Combo#2

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Nov-11	700	0	1.256%	94%	0.00	0.00	0.0		500	23	0.500%	94%	0.11	0.02	1.3	37,400	33	2.94%	94%	0.90	0.16	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.18	0.0	0.2	0.1	0.09	0.09	0.07	0.84	1.05	3.60	
Dec-11	700	0	1.256%	100%	0.00	0.00	0.0		500	23	0.500%	100%	0.12	0.02	1.4	37,400	33	2.94%	100%	0.96	0.17	0.1	0	0	1.26%	100%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.07	0.09	0.19	0.0	0.3	0.1	0.14	0.15	0.12	1.07	1.29	4.03	
Jan-12	700	0	1.256%	91%	0.00	0.00	0.0		500	1	0.500%	91%	0.01	0.00	0.1	37,350	30	2.94%	91%	0.80	0.14	0.1	2,100	190	1.26%	91%	2.39	0.42	6.6	1.25	40650	2.49	60000	40,650	0.12	0.15	0.57	0.0	0.7	0.3	0.35	0.36	0.29	1.76	1.94	5.03	
Feb-12	700	0	1.256%	94%	0.00	0.00	0.0		500	1	0.500%	94%	0.01	0.00	0.1	37,350	30	2.94%	94%	0.83	0.15	0.1	2,100	190	1.26%	94%	2.39	0.42	6.6	1.25	40650	2.49	60000	40,650	0.29	0.36	0.57	0.0	0.9	0.4	0.46	0.47	0.37	2.04	2.18	5.38	
Mar-12	700	0	1.256%	93%	0.00	0.00	0.0		500	1	0.500%	93%	0.01	0.00	0.1	37,350	30	2.94%	93%	0.82	0.15	0.1	2,100	190	1.26%	93%	2.39	0.42	6.6	1.25	40650	2.49	60000	40,650	0.37	0.47	0.57	0.0	1.0	0.4	0.52	0.52	0.42	2.16	2.29	5.53	
Apr-12	700	0	1.256%	117%	0.00	0.00	0.0		500	1	0.500%	117%	0.01	0.00	0.1	37,350	30	2.94%	117%	1.03	0.18	0.2	2,100	190	1.26%	117%	2.39	0.42	6.6	1.25	40650	2.49	60000	40,650	0.42	0.52	0.61	1.0	0.1	0.1	0.06	0.06	0.05	0.68	0.89	3.29	
May-12	700	0	1.256%	116%	0.00	0.00	0.0		500	1	0.500%	116%	0.01	0.00	0.1	37,350	30	2.94%	116%	1.02	0.18	0.2	2,100	190	1.26%	116%	2.39	0.42	6.6	1.25	40650	2.49	60000	40,650	0.05	0.06	0.60	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-12	700	0	1.256%	111%	0.00	0.00	0.0		500	1	0.500%	111%	0.01	0.00	0.1	37,350	30	2.94%	111%	0.98	0.17	0.2	2,100	190	1.26%	111%	2.39	0.42	6.6	1.25	40650	2.49	60000	40,650	0.00	0.00	0.60	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-12	700	0	1.256%	87%	0.00	0.00	0.0		500	1	0.500%	87%	0.01	0.00	0.1	37,350	30	2.94%	87%	0.76	0.14	0.1	2,100	190	1.26%	87%	2.39	0.42	6.6	1.25	40650	2.49	60000	40,650	0.00	0.00	0.56	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-12	700	0	1.256%	91%	0.00	0.00	0.0		500	1	0.500%	91%	0.01	0.00	0.1	37,350	30	2.94%	91%	0.80	0.14	0.1	2,100	190	1.26%	91%	2.39	0.42	6.6	1.25	40650	2.49	60000	40,650	0.00	0.00	0.57	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-12	700	0	1.256%	111%	0.00	0.00	0.0		500	1	0.500%	111%	0.01	0.00	0.1	37,350	30	2.94%	111%	0.98	0.17	0.2	2,100	190	1.26%	111%	2.39	0.42	6.6	1.25	40650	2.49	60000	40,650	0.00	0.00	0.60	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-12	700	0	1.256%	94%	0.00	0.00	0.0		500	1	0.500%	94%	0.01	0.00	0.1	37,350	30	2.94%	94%	0.83	0.15	0.1	2,100	190	1.26%	94%	2.39	0.42	6.6	1.25	40650	2.49	60000	40,650	0.00	0.00	0.57	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-12	700	0	1.256%	94%	0.00	0.00	0.0		500	1	0.500%	94%	0.01	0.00	0.1	37,350	30	2.94%	94%	0.83	0.15	0.1	2,100	190	1.26%	94%	2.39	0.42	6.6	1.25	40650	2.49	60000	40,650	0.00	0.00	0.57	0.0	0.6	0.2	0.28	0.29	0.23	1.56	1.75	4.77	
Dec-12	700	0	1.256%	100%	0.00	0.00	0.0		500	1	0.500%	100%	0.01	0.00	0.1	37,350	30	2.94%	100%	0.88	0.16	0.1	2,100	190	1.26%	100%	2.39	0.42	6.6	1.25	40650	2.49	60000	40,650	0.23	0.29	0.58	0.0	0.9	0.3	0.43	0.44	0.35	1.96	2.12	5.29	
Jan-13	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	37,300	17	2.94%	91%	0.45	0.08	0.1	4,500	376	1.26%	91%	4.72	0.84	6.1	1.25	43000	2.56	60000	43,000	0.35	0.44	0.92	0.0	1.4	0.5	0.69	0.66	0.53	2.46	2.55	5.86	
Feb-13	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	37,300	17	2.94%	94%	0.46	0.08	0.1	4,500	376	1.26%	94%	4.72	0.84	6.1	1.25	43000	2.56	60000	43,000	0.53	0.66	0.92	0.0	1.6	0.6	0.81	0.77	0.62	2.68	2.74	6.09	
Mar-13	700	0	1.256%	93%	0.00	0.00	0.0		500	0	0.500%	93%	0.00	0.00	0.0	37,300	17	2.94%	93%	0.46	0.08	0.1	4,500	376	1.26%	93%	4.72	0.84	6.1	1.25	43000	2.56	60000	43,000	0.62	0.77	0.92	0.0	1.7	0.7	0.86	0.83	0.66	2.79	2.82	6.19	
Apr-13	700	0	1.256%	117%	0.00	0.00	0.0		500	0	0.500%	117%	0.00	0.00	0.0	37,300	17	2.94%	117%	0.57	0.10	0.1	4,500	376	1.26%	117%	4.72	0.84	6.1	1.25	43000	2.56	60000	43,000	0.66	0.83	0.94	1.0	0.8	0.3	0.39	0.37	0.30	1.80	1.97	5.09	
May-13	700	0	1.256%	116%	0.00	0.00	0.0		500	0	0.500%	116%	0.00	0.00	0.0	37,300	17	2.94%	116%	0.57	0.10	0.1	4,500	376	1.26%	116%	4.72	0.84	6.1	1.25	43000	2.56	60000	43,000	0.30	0.37	0.94	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-13	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	37,300	17	2.94%	111%	0.54	0.10	0.1	4,500	376	1.26%	111%	4.72	0.84	6.1	1.25	43000	2.56	60000	43,000	0.00	0.00	0.93	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-13	700	0	1.256%	87%	0.00	0.00	0.0		500	0	0.500%	87%	0.00	0.00	0.0	37,300	17	2.94%	87%	0.42	0.08	0.1	4,500	376	1.26%	87%	4.72	0.84	6.1	1.25	43000	2.56	60000	43,000	0.00	0.00	0.91	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-13	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	37,300	17	2.94%	91%	0.45	0.08	0.1	4,500	376	1.26%	91%	4.72	0.84	6.1	1.25	43000	2.56	60000	43,000	0.00	0.00	0.92	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-13	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	37,300	17	2.94%	111%	0.54	0.10	0.1	4,500	376	1.26%	111%	4.72	0.84	6.1	1.25	43000	2.56	60000	43,000	0.00	0.00	0.93	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-13	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	37,300	17	2.94%	94%	0.46	0.08	0.1	4,500	376	1.26%	94%	4.72	0.84	6.1	1.25	43000	2.56	60000	43,000	0.00	0.00	0.92	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-13	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	37,300	17	2.94%	94%	0.46	0.08	0.1	4,500	376	1.26%	94%	4.72	0.84	6.1	1.25	43000	2.56	60000	43,000	0.00	0.00	0.92	0.0	0.9	0.4	0.47	0.45	0.36	1.99	2.14	5.32	
Dec-13	700	0	1.256%	100%	0.00	0.00	0.0		500	0	0.500%	100%	0.00	0.00	0.0	37,300	17	2.94%	100%	0.49	0.09	0.1	4,500	376	1.26%	100%	4.72	0.84	6.1	1.25	43000	2.56	60000	43,000	0.36	0.45	0.92	0.0	1.4	0.5	0.70	0.67	0.54	2.48	2.57	5.88	
Jan-14	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	38,950	21	2.94%	91%	0.56	0.10	0.1	7,200	468	1.26%	91%	5.87	1.04	4.7	1.25	47350	2.69	60000	47,350	0.54	0.67	1.14	0.0	1.8	0.7	0.97	0.84	0.67	2.81	2.84	6.22	
Feb-14	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	38,950	21	2.94%	94%	0.58	0.10	0.1	7,200	468	1.26%	94%	5.87	1.04	4.7	1.25	47350	2.69	60000	47,350	0.67	0.84	1.14	0.0	2.0	0.7	1.06	0.92	0.74	2.96	2.96	6.36	
Mar-14	700	0	1.256%	93%	0.00	0.00	0.0		500	0	0.500%	93%	0.00	0.00	0.0	38,950	21	2.94%	93%	0.57	0.10	0.1	7,200	468	1.26%	93%	5.87	1.04	4.7	1.25	47350	2.69	60000	47,350	0.74	0.92	1.14	0.0	2.1	0.8	1.10	0.96	0.77	3.02	3.02	6.42	
Apr-14	700	0	1.256%	117%	0.00	0.00	0.0		500	0	0.500%	117%	0.00	0.00	0.0	38,950	21	2.94%	117%	0.71	0.13	0.1	7,200	468	1.26%	117%	5.87	1.04	4.7	1.25	47350	2.69	60000	47,350	0.77	0.96	1.17	1.0	1.1	0.4	0.60	0.52	0.42	2.17	2.30	5.53	
May-14	700	0	1.256%	116%	0.00	0.00	0.0		500	0	0.500%	116%	0.00	0.00	0.0	38,950	21	2.94%	116%	0.71	0.13	0.1	7,200	468	1.26%	116%	5.87	1.04	4.7	1.25	47350	2.69	60000	47,350	0.42	0.52	1.17	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-14	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	38,950	21	2.94%	111%	0.68	0.12	0.1	7,200	468	1.26%	111%	5.87	1.04	4.7	1.25	47350	2.69	60000	47,350	0.00	0.00	1.16	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-14	700	0	1.256%	87%	0.00	0.00	0.0		500	0	0.500%	87%	0.00	0.00	0.0	38,950	21	2.94%	87%	0.53	0.09	0.1	7,200	468	1.26%	87%	5.87	1.04	4.7	1.25	47350	2.69	60000	47,350	0.00	0.00	1.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-14	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	38,950	21	2.94%	91%	0.56	0.10	0.1	7,200	468	1.26%	91%	5.87	1.04	4.7	1.25	47350	2.69	60000	47,350	0.00	0.00	1.14	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-14	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	38,950	21	2.94%	111%	0.68	0.12	0.1	7,200	468	1.26%	111%	5.87	1.04	4.7	1.25	47350	2.69	60000	47,350	0.00	0.00	1.16	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-14	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	38,950	21	2.94%	94%	0.58	0.10	0.1	7,200	468	1.26%	94%	5.87	1.04	4.7	1.25	47350	2.69	60000	47,350	0.00	0.00	1.14	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-14	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	38,950	21	2.94%	94%	0.58	0.10	0.1	7,200	468	1.26%	94%	5.87	1.04	4.7	1.25	47350	2.69	60000	47,350	0.00	0.00	1.14	0.0	1.1	0.4	0.61	0.53	0.42	2.19	2.31	5.55	
Dec-14	700	0	1.256%	100%	0.00	0.00	0.0		500	0	0.500%	100%	0.00	0.00	0.0	38,950	21	2.94%	100%	0.61	0.11	0.1	7,200	468	1.26%	100%	5.87	1.04	4.7	1.25	47350	2.69	60000	47,350	0.42	0.53	1.15	0.0	1.7	0.6	0.90	0.78	0.62	2.70	2.75	6.11	
Jan-15	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	40,600	28	2.94%	91%	0.76	0.13	0.1	0	0	1.26%	91%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.62	0.78	0.13	0.0	0.9	0.4	0.46	0.45	0.36	2.00	2.15	5.34	
Feb-15	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	40,600	28	2.94%	94%	0.79	0.14	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.36	0.45	0.14	0.0	0.6	0.2	0.30	0.29	0.24	1.58	1.77	4.80	
Mar-15	700	0	1.256%	93%	0.00	0.00	0.0		500	0	0.500%	93%	0.00	0.00	0.0	40,600	28	2.94%	93%	0.78	0.14	0.1	0	0	1.26%	93%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.24	0.29	0.14	0.0	0.4	0.2	0.22	0.21	0.17	1.33	1.54	4.43	
Apr-15	700	0	1.256%	117%	0.00	0.00	0.0		500	0	0.500%	117%	0.00	0.00	0.0	40,600	28	2.94%	117%	0.97	0.17	0.1	0	0	1.26%	117%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.17	0.21	0.17	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-15	700	0	1.256%	116%	0.00	0.00	0.0		500	0	0.500%	116%	0.00	0.00	0.0	40,600	28	2.94%	116%	0.96	0.17	0.1	0	0	1.26%	116%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.17	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-15	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	40,600	28	2.94%	111%	0.93	0.16	0.1	0	0	1.26%	111%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.16	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-15	700	0	1.256%	87%	0.00	0.00	0.0		500	0	0.500%	87%	0.00	0.00	0.0	40,600	28	2.94%	87%	0.72	0.13	0.1	0	0	1.26%	87%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-15	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	40,600	28	2.94%	91%	0.76	0.13	0.1	0	0	1.26%	91%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-15	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	40,600	28	2.94%	111%	0.93	0.16	0.1	0	0	1.26%	111%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.16	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-15	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	40,600	28	2.94%	94%	0.79	0.14	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.14	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-15	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	40,600	28	2.94%	94%	0.79	0.14	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.14	0.0	0.1	0.1	0.07	0.07	0.06	0.71	0.92	3.35	
Dec-15	700	0	1.256%	100%	0.00	0.00	0.0		500	0	0.500%	100%	0.00	0.00	0.0	40,600	28	2.94%	100%	0.83	0.15	0.1	0	0	1.26%	100%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.06	0.07	0.15	0.0	0.2	0.1	0.11	0.11	0.09	0.91	1.13	3.74	
Jan-16	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	40,000	31	2.94%	91%	0.83	0.15	0.1	0	0	1.26%	91%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.09	0.11	0.15	0.0	0.3	0.1	0.13	0.13	0.10	0.99	1.21	3.89	
Feb-16	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	40,000	31	2.94%	94%	0.86	0.15	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.10	0.13	0.15	0.0	0.3	0.1	0.14	0.14	0.11	1.05	1.27	3.98	
Mar-16	700	0	1.256%	93%	0.00	0.00	0.0		500	0	0.500%	93%	0.00	0.00	0.0	40,000	31	2.94%	93%	0.85	0.15	0.1	0	0	1.26%	93%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.11	0.14	0.15	0.0	0.3	0.1	0.14	0.14	0.12	1.07	1.29	4.02	

WLWB Ammonia Model - Improved Blasting Methods Combo#2

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Apr-16	700	0	1.256%	117%	0.00	0.00	0.0		500	0	0.500%	117%	0.00	0.00	0.0	40,000	31	2.94%	117%	1.06	0.19	0.2	0	0	1.26%	117%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.12	0.14	0.19	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-16	700	0	1.256%	116%	0.00	0.00	0.0		500	0	0.500%	116%	0.00	0.00	0.0	40,000	31	2.94%	116%	1.05	0.19	0.2	0	0	1.26%	116%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.19	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-16	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	40,000	31	2.94%	111%	1.01	0.18	0.1	0	0	1.26%	111%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-16	700	0	1.256%	87%	0.00	0.00	0.0		500	0	0.500%	87%	0.00	0.00	0.0	40,000	31	2.94%	87%	0.79	0.14	0.1	0	0	1.26%	87%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.14	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-16	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	40,000	31	2.94%	91%	0.83	0.15	0.1	0	0	1.26%	91%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.15	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-16	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	40,000	31	2.94%	111%	1.01	0.18	0.1	0	0	1.26%	111%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-16	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	40,000	31	2.94%	94%	0.86	0.15	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.15	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-16	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	40,000	31	2.94%	94%	0.86	0.15	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.15	0.0	0.2	0.1	0.08	0.08	0.06	0.75	0.96	3.43	
Dec-16	700	0	1.256%	100%	0.00	0.00	0.0		500	0	0.500%	100%	0.00	0.00	0.0	40,000	31	2.94%	100%	0.91	0.16	0.1	0	0	1.26%	100%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.06	0.08	0.16	0.0	0.2	0.1	0.12	0.12	0.09	0.96	1.18	3.83	
Jan-17	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	39,500	38	2.94%	91%	1.00	0.18	0.1	0	0	1.26%	91%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.09	0.12	0.18	0.0	0.3	0.1	0.15	0.15	0.12	1.09	1.30	4.05	
Feb-17	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	39,500	38	2.94%	94%	1.04	0.18	0.2	0	0	1.26%	94%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.12	0.15	0.18	0.0	0.3	0.1	0.17	0.17	0.13	1.16	1.38	4.17	
Mar-17	700	0	1.256%	93%	0.00	0.00	0.0		500	0	0.500%	93%	0.00	0.00	0.0	39,500	38	2.94%	93%	1.03	0.18	0.2	0	0	1.26%	93%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.13	0.17	0.18	0.0	0.3	0.1	0.17	0.18	0.14	1.19	1.41	4.22	
Apr-17	700	0	1.256%	117%	0.00	0.00	0.0		500	0	0.500%	117%	0.00	0.00	0.0	39,500	38	2.94%	117%	1.29	0.23	0.2	0	0	1.26%	117%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.14	0.18	0.23	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-17	700	0	1.256%	116%	0.00	0.00	0.0		500	0	0.500%	116%	0.00	0.00	0.0	39,500	38	2.94%	116%	1.27	0.23	0.2	0	0	1.26%	116%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.23	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-17	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	39,500	38	2.94%	111%	1.23	0.22	0.2	0	0	1.26%	111%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-17	700	0	1.256%	87%	0.00	0.00	0.0		500	0	0.500%	87%	0.00	0.00	0.0	39,500	38	2.94%	87%	0.96	0.17	0.1	0	0	1.26%	87%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.17	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-17	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	39,500	38	2.94%	91%	1.00	0.18	0.1	0	0	1.26%	91%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-17	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	39,500	38	2.94%	111%	1.23	0.22	0.2	0	0	1.26%	111%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-17	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	39,500	38	2.94%	94%	1.04	0.18	0.2	0	0	1.26%	94%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.18	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-17	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	39,500	38	2.94%	94%	1.04	0.18	0.2	0	0	1.26%	94%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.18	0.0	0.2	0.1	0.09	0.09	0.07	0.84	1.05	3.60	
Dec-17	700	0	1.256%	100%	0.00	0.00	0.0		500	0	0.500%	100%	0.00	0.00	0.0	39,500	38	2.94%	100%	1.10	0.20	0.2	0	0	1.26%	100%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.07	0.09	0.20	0.0	0.3	0.1	0.14	0.14	0.12	1.07	1.29	4.02	
Jan-18	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	39,000	37	2.94%	91%	0.98	0.17	0.1	0	0	1.26%	91%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.12	0.14	0.17	0.0	0.3	0.1	0.16	0.16	0.13	1.13	1.35	4.13	
Feb-18	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	39,000	37	2.94%	94%	1.02	0.18	0.2	0	0	1.26%	94%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.13	0.16	0.18	0.0	0.3	0.1	0.17	0.17	0.14	1.18	1.40	4.20	
Mar-18	700	0	1.256%	93%	0.00	0.00	0.0		500	0	0.500%	93%	0.00	0.00	0.0	39,000	37	2.94%	93%	1.01	0.18	0.2	0	0	1.26%	93%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.14	0.17	0.18	0.0	0.4	0.1	0.17	0.18	0.14	1.20	1.41	4.23	
Apr-18	700	0	1.256%	117%	0.00	0.00	0.0		500	0	0.500%	117%	0.00	0.00	0.0	39,000	37	2.94%	117%	1.26	0.22	0.2	0	0	1.26%	117%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.14	0.18	0.22	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-18	700	0	1.256%	116%	0.00	0.00	0.0		500	0	0.500%	116%	0.00	0.00	0.0	39,000	37	2.94%	116%	1.25	0.22	0.2	0	0	1.26%	116%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.22	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-18	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	39,000	37	2.94%	111%	1.20	0.21	0.2	0	0	1.26%	111%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.21	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-18	700	0	1.256%	87%	0.00	0.00	0.0		500	0	0.500%	87%	0.00	0.00	0.0	39,000	37	2.94%	87%	0.93	0.17	0.1	0	0	1.26%	87%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.17	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-18	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	39,000	37	2.94%	91%	0.98	0.17	0.1	0	0	1.26%	91%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.17	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-18	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	39,000	37	2.94%	111%	1.20	0.21	0.2	0	0	1.26%	111%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.21	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-18	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	39,000	37	2.94%	94%	1.02	0.18	0.2	0	0	1.26%	94%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.18	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-18	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	39,000	37	2.94%	94%	1.02	0.18	0.2	0	0	1.26%	94%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.18	0.0	0.2	0.1	0.09	0.09	0.07	0.83	1.05	3.59	
Dec-18	700	0	1.256%	100%	0.00	0.00	0.0		500	0	0.500%	100%	0.00	0.00	0.0	39,000	37	2.94%	100%	1.08	0.19	0.2	0	0	1.26%	100%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.07	0.09	0.19	0.0	0.3	0.1	0.14	0.14	0.11	1.06	1.28	4.01	
Jan-19	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	38,500	33	2.94%	91%	0.87	0.15	0.1	0	0	1.26%	91%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.11	0.14	0.15	0.0	0.3	0.1	0.15	0.15	0.12	1.09	1.31	4.07	
Feb-19	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	38,500	33	2.94%	94%	0.90	0.16	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.12	0.15	0.16	0.0	0.3	0.1	0.15	0.16	0.13	1.12	1.34	4.11	
Mar-19	700	0	1.256%	93%	0.00	0.00	0.0		500	0	0.500%	93%	0.00	0.00	0.0	38,500	33	2.94%	93%	0.89	0.16	0.1	0	0	1.26%	93%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.13	0.16	0.16	0.0	0.3	0.1	0.16	0.16	0.13	1.13	1.35	4.13	
Apr-19	700	0	1.256%	117%	0.00	0.00	0.0		500	0	0.500%	117%	0.00	0.00	0.0	38,500	33	2.94%	117%	1.11	0.20	0.2	0	0	1.26%	117%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.13	0.16	0.20	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-19	700	0	1.256%	116%	0.00	0.00	0.0		500	0	0.500%	116%	0.00	0.00	0.0	38,500	33	2.94%	116%	1.10	0.20	0.2	0	0	1.26%	116%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.20	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-19	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	38,500	33	2.94%	111%	1.06	0.19	0.2	0	0	1.26%	111%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-19	700	0	1.256%	87%	0.00	0.00	0.0		500	0	0.500%	87%	0.00	0.00	0.0	38,500	33	2.94%	87%	0.83	0.15	0.1	0	0	1.26%	87%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.15	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-19	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	38,500	33	2.94%	91%	0.87	0.15	0.1	0	0	1.26%	91%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.15	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-19	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	38,500	33	2.94%	111%	1.06	0.19	0.2	0	0	1.26%	111%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-19	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	38,500	33	2.94%	94%	0.90	0.16	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.16	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-19	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	38,500	33	2.94%	94%	0.90	0.16	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.16	0.0	0.2	0.1	0.08	0.08	0.07	0.78	0.99	3.49	
Dec-19	700	0	1.256%	100%	0.00	0.00	0.0		500	0	0.500%	100%	0.00	0.00	0.0	38,500	33	2.94%	100%	0.96	0.17	0.1	0	0	1.26%	100%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.07	0.08	0.17	0.0	0.3	0.1	0.12	0.13	0.10	1.00	1.22	3.90	
Jan-20	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	42,600	38	2.94%	91%	1.03	0.18	0.1	0	0	1.26%	91%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.10	0.13	0.18	0.0	0.3	0.1	0.16	0.15	0.12	1.09	1.31	4.06	
Feb-20	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	42,600	38	2.94%	94%	1.06	0.19	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.12	0.15	0.19	0.0	0.3	0.1	0.17	0.16	0.13	1.14	1.36	4.15	
Mar-20	700	0	1.256%	93%	0.00	0.00	0.0		500	0	0.500%	93%	0.00	0.00	0.0	42,600	38	2.94%	93%	1.05	0.19	0.1	0	0	1.26%	93%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.13	0.16	0.19	0.0	0.4	0.1	0.18	0.17	0.14	1.17	1.38	4.18	
Apr-20	700	0	1.256%	117%	0.00	0.00	0.0		500	0	0.500%	117%	0.00	0.00	0.0	42,600	38	2.94%	117%	1.31	0.23	0.2	0	0	1.26%	117%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.14	0.17	0.23	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-20	700	0	1.256%	116%	0.00	0.00	0.0		500	0	0.500%	116%	0.00	0.00	0.0	42,600	38	2.94%	116%	1.30	0.23	0.2	0	0	1.26%	116%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.23	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-20	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	42,600	38	2.94%	111%	1.25	0.22	0.2	0	0	1.26%	111%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-20	700	0	1.256%	87%	0.00	0.00	0.0		500	0	0.500%	87%	0.00	0.00	0.0	42,600	38	2.94%	87%	0.98	0.17	0.1	0	0	1.26%	87%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.17	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-20	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	42,600	38	2.94%	91%	1.03	0.18	0.1	0	0	1.26%	91%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Improved Blasting Methods Combo#2

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Sep-20	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	42,600	38	2.94%	111%	1.25	0.22	0.2	0	0	1.26%	111%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-20	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	42,600	38	2.94%	94%	1.06	0.19	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.19	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-20	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	42,600	38	2.94%	94%	1.06	0.19	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.19	0.0	0.2	0.1	0.10	0.09	0.07	0.83	1.05	3.59	
Dec-20	700	0	1.256%	100%	0.00	0.00	0.0		500	0	0.500%	100%	0.00	0.00	0.0	42,600	38	2.94%	100%	1.13	0.20	0.2	0	0	1.26%	100%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.07	0.09	0.20	0.0	0.3	0.1	0.15	0.14	0.11	1.05	1.27	4.00	
Jan-21	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	46,800	40	2.94%	91%	1.07	0.19	0.1	0	0	1.26%	91%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.11	0.14	0.19	0.0	0.3	0.1	0.18	0.15	0.12	1.10	1.32	4.08	
Feb-21	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	46,800	40	2.94%	94%	1.11	0.20	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.12	0.15	0.20	0.0	0.3	0.1	0.19	0.16	0.13	1.13	1.35	4.13	
Mar-21	700	0	1.256%	93%	0.00	0.00	0.0		500	0	0.500%	93%	0.00	0.00	0.0	46,800	40	2.94%	93%	1.10	0.19	0.1	0	0	1.26%	93%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.13	0.16	0.19	0.0	0.4	0.1	0.19	0.16	0.13	1.15	1.36	4.15	
Apr-21	700	0	1.256%	117%	0.00	0.00	0.0		500	0	0.500%	117%	0.00	0.00	0.0	46,800	40	2.94%	117%	1.37	0.24	0.2	0	0	1.26%	117%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.13	0.16	0.24	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-21	700	0	1.256%	116%	0.00	0.00	0.0		500	0	0.500%	116%	0.00	0.00	0.0	46,800	40	2.94%	116%	1.36	0.24	0.2	0	0	1.26%	116%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.24	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-21	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	46,800	40	2.94%	111%	1.31	0.23	0.2	0	0	1.26%	111%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.23	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-21	700	0	1.256%	87%	0.00	0.00	0.0		500	0	0.500%	87%	0.00	0.00	0.0	46,800	40	2.94%	87%	1.02	0.18	0.1	0	0	1.26%	87%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-21	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	46,800	40	2.94%	91%	1.07	0.19	0.1	0	0	1.26%	91%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-21	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	46,800	40	2.94%	111%	1.31	0.23	0.2	0	0	1.26%	111%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.23	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-21	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	46,800	40	2.94%	94%	1.11	0.20	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.20	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-21	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	46,800	40	2.94%	94%	1.11	0.20	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.20	0.0	0.2	0.1	0.11	0.09	0.07	0.83	1.04	3.59	
Dec-21	700	0	1.256%	100%	0.00	0.00	0.0		500	0	0.500%	100%	0.00	0.00	0.0	46,800	40	2.94%	100%	1.18	0.21	0.1	0	0	1.26%	100%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.07	0.09	0.21	0.0	0.3	0.1	0.16	0.14	0.11	1.04	1.26	3.98	
Jan-22	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	42,200	32	2.94%	91%	0.85	0.15	0.1	0	0	1.26%	91%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.11	0.14	0.15	0.0	0.3	0.1	0.15	0.14	0.11	1.05	1.27	3.99	
Feb-22	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	42,200	32	2.94%	94%	0.88	0.16	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.11	0.14	0.16	0.0	0.3	0.1	0.15	0.14	0.12	1.07	1.29	4.02	
Mar-22	700	0	1.256%	93%	0.00	0.00	0.0		500	0	0.500%	93%	0.00	0.00	0.0	42,200	32	2.94%	93%	0.87	0.15	0.1	0	0	1.26%	93%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.12	0.14	0.15	0.0	0.3	0.1	0.15	0.14	0.12	1.07	1.29	4.03	
Apr-22	700	0	1.256%	117%	0.00	0.00	0.0		500	0	0.500%	117%	0.00	0.00	0.0	42,200	32	2.94%	117%	1.09	0.19	0.1	0	0	1.26%	117%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.12	0.14	0.19	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-22	700	0	1.256%	116%	0.00	0.00	0.0		500	0	0.500%	116%	0.00	0.00	0.0	42,200	32	2.94%	116%	1.08	0.19	0.1	0	0	1.26%	116%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.19	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-22	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	42,200	32	2.94%	111%	1.03	0.18	0.1	0	0	1.26%	111%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-22	700	0	1.256%	87%	0.00	0.00	0.0		500	0	0.500%	87%	0.00	0.00	0.0	42,200	32	2.94%	87%	0.81	0.14	0.1	0	0	1.26%	87%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.14	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-22	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	42,200	32	2.94%	91%	0.85	0.15	0.1	0	0	1.26%	91%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.15	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-22	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	42,200	32	2.94%	111%	1.03	0.18	0.1	0	0	1.26%	111%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-22	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	42,200	32	2.94%	94%	0.88	0.16	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.16	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-22	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	42,200	32	2.94%	94%	0.88	0.16	0.1	0	0	1.26%	94%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.16	0.0	0.2	0.1	0.08	0.08	0.06	0.75	0.96	3.43	
Dec-22	700	0	1.256%	100%	0.00	0.00	0.0		500	0	0.500%	100%	0.00	0.00	0.0	42,200	32	2.94%	100%	0.93	0.16	0.1	0	0	1.26%	100%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.06	0.08	0.16	0.0	0.2	0.1	0.12	0.12	0.09	0.95	1.17	3.82	
Jan-23	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	37,700	35	2.94%	91%	0.94	0.17	0.1	0	0	1.26%	91%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.09	0.12	0.17	0.0	0.3	0.1	0.14	0.15	0.12	1.07	1.29	4.03	
Feb-23	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	37,700	35	2.94%	94%	0.97	0.17	0.2	0	0	1.26%	94%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.12	0.15	0.17	0.0	0.3	0.1	0.15	0.16	0.13	1.14	1.36	4.15	
Mar-23	700	0	1.256%	93%	0.00	0.00	0.0		500	0	0.500%	93%	0.00	0.00	0.0	37,700	35	2.94%	93%	0.96	0.17	0.1	0	0	1.26%	93%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.13	0.16	0.17	0.0	0.3	0.1	0.16	0.17	0.14	1.17	1.39	4.20	
Apr-23	700	0	1.256%	117%	0.00	0.00	0.0		500	0	0.500%	117%	0.00	0.00	0.0	37,700	35	2.94%	117%	1.20	0.21	0.2	0	0	1.26%	117%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.14	0.17	0.21	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-23	700	0	1.256%	116%	0.00	0.00	0.0		500	0	0.500%	116%	0.00	0.00	0.0	37,700	35	2.94%	116%	1.19	0.21	0.2	0	0	1.26%	116%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.21	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-23	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	37,700	35	2.94%	111%	1.14	0.20	0.2	0	0	1.26%	111%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.20	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-23	700	0	1.256%	87%	0.00	0.00	0.0		500	0	0.500%	87%	0.00	0.00	0.0	37,700	35	2.94%	87%	0.89	0.16	0.1	0	0	1.26%	87%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.16	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-23	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	37,700	35	2.94%	91%	0.94	0.17	0.1	0	0	1.26%	91%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.17	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-23	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	37,700	35	2.94%	111%	1.14	0.20	0.2	0	0	1.26%	111%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.20	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-23	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	37,700	35	2.94%	94%	0.97	0.17	0.2	0	0	1.26%	94%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.17	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-23	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	37,700	35	2.94%	94%	0.97	0.17	0.2	0	0	1.26%	94%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.17	0.0	0.2	0.1	0.08	0.09	0.07	0.82	1.03	3.56	
Dec-23	700	0	1.256%	100%	0.00	0.00	0.0		500	0	0.500%	100%	0.00	0.00	0.0	37,700	35	2.94%	100%	1.03	0.18	0.2	0	0	1.26%	100%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.07	0.09	0.18	0.0	0.3	0.1	0.13	0.14	0.11	1.05	1.27	3.98	
Jan-24	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	38,300	10	2.94%	91%	0.27	0.05	0.0	0	0	1.26%	91%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.11	0.14	0.05	0.0	0.2	0.1	0.09	0.10	0.08	0.85	1.07	3.63	
Feb-24	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	38,300	10	2.94%	94%	0.28	0.05	0.0	0	0	1.26%	94%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.08	0.10	0.05	0.0	0.1	0.1	0.07	0.07	0.06	0.74	0.95	3.40	
Mar-24	700	0	1.256%	93%	0.00	0.00	0.0		500	0	0.500%	93%	0.00	0.00	0.0	38,300	10	2.94%	93%	0.27	0.05	0.0	0	0	1.26%	93%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.06	0.07	0.05	0.0	0.1	0.0	0.06	0.06	0.05	0.67	0.88	3.27	
Apr-24	700	0	1.256%	117%	0.00	0.00	0.0		500	0	0.500%	117%	0.00	0.00	0.0	38,300	10	2.94%	117%	0.34	0.06	0.1	0	0	1.26%	117%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.05	0.06	0.06	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-24	700	0	1.256%	116%	0.00	0.00	0.0		500	0	0.500%	116%	0.00	0.00	0.0	38,300	10	2.94%	116%	0.34	0.06	0.1	0	0	1.26%	116%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.06	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-24	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	38,300	10	2.94%	111%	0.33	0.06	0.0	0	0	1.26%	111%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-24	700	0	1.256%	87%	0.00	0.00	0.0		500	0	0.500%	87%	0.00	0.00	0.0	38,300	10	2.94%	87%	0.25	0.05	0.0	0	0	1.26%	87%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.05	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-24	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	38,300	10	2.94%	91%	0.27	0.05	0.0	0	0	1.26%	91%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.05	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-24	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	38,300	10	2.94%	111%	0.33	0.06	0.0	0	0	1.26%	111%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-24	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	38,300	10	2.94%	94%	0.28	0.05	0.0	0	0	1.26%	94%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.05	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-24	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	38,300	10	2.94%	94%	0.28	0.05	0.0	0	0	1.26%	94%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.05	0.0	0.0	0.0	0.02	0.03	0.02	0.41	0.59	2.61	
Dec-24	700	0	1.256%	100%	0.00	0.00	0.0		500	0	0.500%	100%	0.00	0.00	0.0	38,300	10	2.94%	100%	0.29	0.05	0.0	0	0	1.26%	100%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.02	0.03	0.05	0.0	0.1	0.0	0.04	0.04	0.03	0.52	0.72	2.92	
Jan-25	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	38,900	0	2.94%	91%	0.00	0.00	0.0	0	0	1.26%	91%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.03	0.04	0.00	0.0	0.0	0.0	0.02	0.02	0.02	0.36	0.53	2.46	

WLWB Ammonia Model - Improved Blasting Methods Combo#2

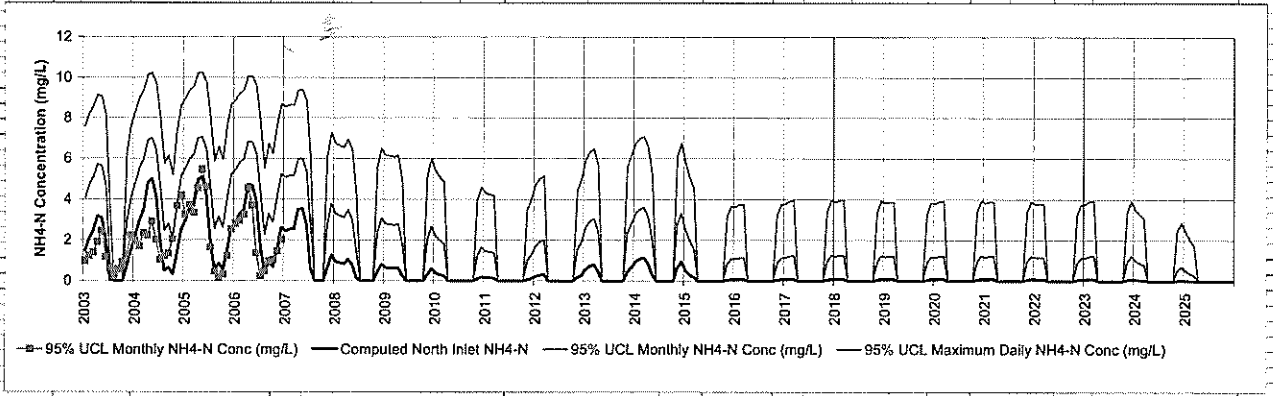
	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N Input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Feb-25	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	38,900	0	2.94%	94%	0.00	0.00	0.0	0	0	1.26%	94%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.02	0.02	0.00	0.0	0.0	0.0	0.01	0.01	0.01	0.25	0.39	2.08	
Mar-25	700	0	1.256%	93%	0.00	0.00	0.0		500	0	0.500%	93%	0.00	0.00	0.0	38,900	0	2.94%	93%	0.00	0.00	0.0	0	0	1.26%	93%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.01	0.01	0.00	0.0	0.0	0.0	0.00	0.01	0.00	0.17	0.29	1.76	
Apr-25	700	0	1.256%	117%	0.00	0.00	0.0		500	0	0.500%	117%	0.00	0.00	0.0	38,900	0	2.94%	117%	0.00	0.00	0.0	0	0	1.26%	117%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.01	0.00	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-25	700	0	1.256%	116%	0.00	0.00	0.0		500	0	0.500%	116%	0.00	0.00	0.0	38,900	0	2.94%	116%	0.00	0.00	0.0	0	0	1.26%	116%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-25	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	38,900	0	2.94%	111%	0.00	0.00	0.0	0	0	1.26%	111%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-25	700	0	1.256%	87%	0.00	0.00	0.0		500	0	0.500%	87%	0.00	0.00	0.0	38,900	0	2.94%	87%	0.00	0.00	0.0	0	0	1.26%	87%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-25	700	0	1.256%	91%	0.00	0.00	0.0		500	0	0.500%	91%	0.00	0.00	0.0	38,900	0	2.94%	91%	0.00	0.00	0.0	0	0	1.26%	91%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-25	700	0	1.256%	111%	0.00	0.00	0.0		500	0	0.500%	111%	0.00	0.00	0.0	38,900	0	2.94%	111%	0.00	0.00	0.0	0	0	1.26%	111%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-25	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	38,900	0	2.94%	94%	0.00	0.00	0.0	0	0	1.26%	94%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-25	700	0	1.256%	94%	0.00	0.00	0.0		500	0	0.500%	94%	0.00	0.00	0.0	38,900	0	2.94%	94%	0.00	0.00	0.0	0	0	1.26%	94%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-25	700	0	1.256%	100%	0.00	0.00	0.0		500	0	0.500%	100%	0.00	0.00	0.0	38,900	0	2.94%	100%	0.00	0.00	0.0	0	0	1.26%	100%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Drainage to Underground Mine

WLWB AMMONIA MANAGEMENT MODEL OF DIAVIK PROJECT

CASE:	**Drainage to Underground Mines**
BLASTING:	Current practices: open hole; 80/20 emulsion/ANFO mix; no liner; wet holes pumped and double primed; large area blasts
AN USE:	Past and future use as per Diavik ADP projections (SNC-Lavalin, Ammonia Balance, May 2006)
MINE INFLOW:	Actual to present, predicted inflows (Golder, 2006) in future. 90% water directed to underground in A154/A218; A154/A418 AN release reduced to equal to first year of A154 (0.924%) to water phase
WATER MANAGEMENT:	All mine water discharged to North Inlet
TREATMENT:	No additional treatment; natural biological degradation in North Inlet to continue at current rate.
FLOW TO LAC DE GRAS:	Actual to present, future discharge equal to input in same month.

RESULTS	**FROM BEGINNING OF**	**03**	**07**	**08**
AMMONIA (N) TO LDG	**TO END OF**	**06**	**07**	**25**
	Average	2.3	1.7	0.1
	Maximum 30 Day	5.1	3.5	1.1
	Maximum 1 Day	8.6	7.0	3.8
	Maximum 95% UCL 30 Day	7.1	6.0	3.6
	Maximum 95% UCL 1 Day	10.3	9.4	7.1



WLWB Ammonia Model - Drainage to Underground Mine

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154						
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)
Jan-03	5,380	867	0.924%	60%	4.80	0.85	5.2	8.4	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0
Feb-03	5,667	867	0.924%	75%	6.00	1.06	6.2	7.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Mar-03	5,954	867	0.924%	70%	5.60	0.99	5.5	5.1	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0
Apr-03	6,251	867	0.924%	175%	14.01	2.48	13.0	10.5	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0
May-03	5,936	867	0.924%	170%	13.61	2.41	13.3	5.4	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0
Jun-03	7,290	867	0.924%	150%	12.01	2.13	9.6	3.2	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0
Jul-03	6,867	867	0.924%	40%	3.20	0.57	2.7	6.7	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0
Aug-03	7,753	867	0.924%	60%	4.80	0.85	3.6	6.1	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0
Sep-03	8,194	867	0.924%	150%	12.01	2.13	8.5	8.4	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0
Oct-03	8,775	867	0.924%	75%	6.00	1.06	4.0	6.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Nov-03	8,935	867	0.924%	75%	6.00	1.06	3.9	6.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Dec-03	8,301	867	0.924%	100%	8.01	1.42	5.6	5.1	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0
Jan-04	8,570	808	1.598%	60%	7.75	1.37	5.3	4.3	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0
Feb-04	7,982	808	1.598%	75%	9.69	1.72	7.1	5.9	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Mar-04	8,828	808	1.598%	70%	9.04	1.60	6.0	6.0	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0
Apr-04	9,324	808	1.598%	175%	22.60	4.00	14.1	5.3	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0
May-04	10,755	808	1.598%	170%	21.95	3.89	11.9	9.3	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0
Jun-04	12,337	808	1.598%	150%	19.37	3.43	9.1	5.3	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0
Jul-04	11,098	808	1.598%	40%	5.17	0.92	2.7	13.4	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0
Aug-04	11,394	808	1.598%	60%	7.75	1.37	4.0	8.9	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0
Sep-04	12,030	808	1.598%	150%	19.37	3.43	9.4	6.7	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0
Oct-04	11,948	808	1.598%	75%	9.69	1.72	4.7	6.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Nov-04	11,300	808	1.598%	75%	9.69	1.72	5.0	7.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Dec-04	10,514	808	1.598%	100%	12.91	2.29	7.2	5.1	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0
Jan-05	10,958	725	1.979%	60%	8.61	1.53	4.6	4.5	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0
Feb-05	11,359	725	1.979%	75%	10.76	1.91	5.5	4.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Mar-05	12,270	725	1.979%	70%	10.04	1.78	4.8	5.8	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0
Apr-05	13,110	725	1.979%	175%	25.11	4.45	11.2	11.5	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0
May-05	14,120	725	1.979%	170%	24.39	4.32	10.1	11.7	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0
Jun-05	15,045	725	1.979%	150%	21.52	3.81	8.3	10.7	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0
Jul-05	15,261	725	1.979%	40%	5.74	1.02	2.2	5.1	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0
Aug-05	14,863	725	1.979%	60%	8.61	1.53	3.4	3.3	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0
Sep-05	15,820	725	1.979%	150%	21.52	3.81	7.9	2.2	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0
Oct-05	15,681	725	1.979%	75%	10.76	1.91	4.0	2.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Nov-05	15,693	725	1.979%	75%	10.76	1.91	4.0	3.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Dec-05	14,884	725	1.979%	100%	14.35	2.54	5.6	6.3	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0
Jan-06	15,584	642	2.256%	60%	8.69	1.54	3.2	3.7	250	0	0.000%	60%	0.00	0.00	0.0	0	46	2.94%	60%	0.81	0.14	#DIV/0!
Feb-06	15,104	642	2.256%	75%	10.86	1.92	4.2	4.8	250	0	0.000%	75%	0.00	0.00	0.0	0	46	2.94%	75%	1.01	0.18	#DIV/0!
Mar-06	15,618	642	2.256%	70%	10.14	1.80	3.8	3.1	250	0	0.000%	70%	0.00	0.00	0.0	0	46	2.94%	70%	0.94	0.17	#DIV/0!
Apr-06	16,453	642	2.256%	175%	25.34	4.49	9.0	9.6	250	0	0.000%	175%	0.00	0.00	0.0	0	46	2.94%	175%	2.35	0.42	#DIV/0!
May-06	19,475	642	2.256%	170%	24.61	4.36	7.4	5.3	250	0	0.000%	170%	0.00	0.00	0.0	0	46	2.94%	170%	2.28	0.40	#DIV/0!
Jun-06	18,310	642	2.256%	150%	21.72	3.85	6.9	3.4	250	0	0.000%	150%	0.00	0.00	0.0	22	46	2.94%	150%	2.01	0.36	531.3
Jul-06	17,677	642	2.256%	40%	5.79	1.03	1.9	4.4	250	0	0.000%	40%	0.00	0.00	0.0	40	46	2.94%	40%	0.54	0.10	77.3
Aug-06	18,560	642	2.256%	60%	8.69	1.54	2.7	7.3	250	0	0.000%	60%	0.00	0.00	0.0	38	46	2.94%	60%	0.81	0.14	122.6
Sep-06	19,176	642	2.256%	150%	21.72	3.85	6.6	5.4	250	0	0.000%	150%	0.00	0.00	0.0	154	46	2.94%	150%	2.01	0.36	76.1
Oct-06	18,487	642	2.256%	75%	10.86	1.92	3.4	3.7	250	0	0.000%	75%	0.00	0.00	0.0	430	46	2.94%	75%	1.01	0.18	13.6
Nov-06	19,635	642	2.256%	75%	10.86	1.92	3.2	2.4	250	0	0.000%	75%	0.00	0.00	0.0	687	46	2.94%	75%	1.01	0.18	8.5
Dec-06	17,652	642	2.256%	100%	14.48	2.57	4.8	4.5	250	0	0.000%	100%	0.00	0.00	0.0	929	46	2.94%	100%	1.34	0.24	8.4
Jan-07	17,200	408	2.794%	60%	6.84	1.21	2.3		500	400	0.924%	60%	2.22	0.39	25.8	8,200	33	2.94%	60%	0.57	0.10	0.4
Feb-07	17,200	408	2.794%	75%	8.56	1.52	2.9		500	400	0.924%	75%	2.77	0.49	32.3	8,200	33	2.94%	75%	0.72	0.13	0.5
Mar-07	17,200	408	2.794%	70%	7.99	1.42	2.7		500	400	0.924%	70%	2.59	0.46	30.1	8,200	33	2.94%	70%	0.67	0.12	0.5
Apr-07	17,200	408	2.794%	175%	19.96	3.54	6.8		500	400	0.924%	175%	6.47	1.15	75.3	8,200	33	2.94%	175%	1.67	0.30	1.2
May-07	17,200	408	2.794%	170%	19.39	3.44	6.6		500	400	0.924%	170%	6.28	1.11	73.2	8,200	33	2.94%	170%	1.62	0.29	1.2

	SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Jan-03	0	0	0.00%	60%	0.00	0.00	0.0	1.25	5380	1.41	32000	17,905	1.00	1.25	0.85	0.0	2.1	1.5	0.81	1.29	1.49	4.35	4.06	7.57	1.0
Feb-03	0	0	0.00%	75%	0.00	0.00	0.0	1.25	5667	1.42	32000	17,175	1.49	1.86	1.06	0.0	2.9	2.1	1.07	1.85	2.05	5.20	4.70	8.20	1.3
Mar-03	0	0	0.00%	70%	0.00	0.00	0.0	1.25	5954	1.43	32000	16,854	2.05	2.57	0.99	0.0	3.6	2.5	1.28	2.29	2.49	5.78	5.12	8.60	1.4
Apr-03	0	0	0.00%	175%	0.00	0.00	0.0	1.25	6251	1.44	32000	16,875	2.49	3.11	2.48	1.0	4.6	3.2	1.64	2.96	3.19	6.62	5.73	9.14	1.9
May-03	0	0	0.00%	170%	0.00	0.00	0.0	1.25	5936	1.43	32000	25,514	3.19	3.99	2.41	2.0	4.4	3.1	2.39	2.01	3.07	6.49	5.64	9.06	2.5
Jun-03	0	0	0.00%	150%	0.00	0.00	0.0	1.25	7290	1.47	32000	29,485	3.07	3.84	2.13	3.0	3.0	2.0	1.81	1.16	2.02	5.15	4.66	8.16	1.2
Jul-03	0	0	0.00%	40%	0.00	0.00	0.0	1.25	6867	1.46	32000	28,379	2.02	2.52	0.57	3.0	0.1	0.1	0.05	0.04	0.06	0.76	0.98	3.45	0.6
Aug-03	0	0	0.00%	60%	0.00	0.00	0.0	1.25	7753	1.49	32000	27,138	0.06	0.08	0.85	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.2
Sep-03	0	0	0.00%	150%	0.00	0.00	0.0	1.25	8194	1.50	32000	29,865	0.00	0.00	2.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.6
Oct-03	0	0	0.00%	75%	0.00	0.00	0.0	1.25	8775	1.52	32000	27,977	0.00	0.00	1.06	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.9
Nov-03	0	0	0.00%	75%	0.00	0.00	0.0	1.25	8935	1.52	32000	15,411	0.00	0.00	1.06	0.0	1.1	0.7	0.33	0.74	0.70	2.87	2.89	6.28	1.3
Dec-03	0	0	0.00%	100%	0.00	0.00	0.0	1.25	8301	1.50	32000	24,385	0.70	0.87	1.42	0.0	2.3	1.5	1.13	1.16	1.53	4.42	4.11	7.62	2.2
Jan-04	0	0	0.00%	60%	0.00	0.00	0.0	1.25	8570	1.51	32000	13,372	1.53	1.91	1.37	0.0	3.3	2.2	0.88	2.40	2.17	5.36	4.82	8.31	2.0
Feb-04	0	0	0.00%	75%	0.00	0.00	0.0	1.25	7982	1.49	32000	7,407	2.17	2.71	1.72	0.0	4.4	3.0	0.67	3.76	2.97	6.37	5.55	8.98	1.7
Mar-04	0	0	0.00%	70%	0.00	0.00	0.0	1.25	8828	1.52	32000	3,826	2.97	3.71	1.60	0.0	5.3	3.5	0.41	4.91	3.50	6.97	5.97	9.35	2.4
Apr-04	0	0	0.00%	175%	0.00	0.00	0.0	1.25	9324	1.53	32000	0	3.50	4.37	4.00	1.0	7.4	4.8	0.00	7.38	4.81	8.30	6.89	10.12	2.2
May-04	0	0	0.00%	170%	0.00	0.00	0.0	1.25	10755	1.58	32000	0	4.81	6.01	3.89	2.0	7.9	5.0	0.00	7.90	5.01	8.49	7.02	10.22	2.9
Jun-04	0	0	0.00%	150%	0.00	0.00	0.0	1.25	12337	1.63	32000	16,027	5.01	6.26	3.43	3.0	6.7	4.1	2.01	4.69	4.12	7.63	6.43	9.74	2.0
Jul-04	0	0	0.00%	40%	0.00	0.00	0.0	1.25	11098	1.59	32000	25,310	4.12	5.15	0.92	3.0	3.1	1.9	1.49	1.58	1.93	5.03	4.57	8.07	1.1
Aug-04	0	0	0.00%	60%	0.00	0.00	0.0	1.25	11394	1.60	32000	28,658	1.93	2.41	1.37	3.0	0.8	0.5	0.43	0.36	0.49	2.37	2.47	5.76	1.2
Sep-04	0	0	0.00%	150%	0.00	0.00	0.0	1.25	12030	1.62	32000	27,577	0.49	0.62	3.43	3.0	1.0	0.6	0.54	0.50	0.65	2.76	2.80	6.17	1.3
Oct-04	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11948	1.61	32000	13,563	0.65	0.81	1.72	2.0	0.5	0.3	0.14	0.39	0.33	1.89	2.06	5.20	2.1
Nov-04	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11300	1.59	32000	12,590	0.33	0.41	1.72	0.0	2.1	1.3	0.51	1.61	1.33	4.10	3.87	7.37	3.7
Dec-04	0	0	0.00%	100%	0.00	0.00	0.0	1.25	10514	1.57	32000	11,561	1.33	1.67	2.29	0.0	4.0	2.5	0.89	3.07	2.52	5.82	5.15	8.62	4.2
Jan-05	0	0	0.00%	60%	0.00	0.00	0.0	1.25	10958	1.58	32000	10,692	2.52	3.15	1.53	0.0	4.7	3.0	0.96	3.72	2.95	6.35	5.53	8.97	3.3
Feb-05	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11359	1.60	32000	12,385	2.95	3.69	1.91	0.0	5.6	3.5	1.32	4.28	3.51	6.98	5.98	9.36	3.7
Mar-05	0	0	0.00%	70%	0.00	0.00	0.0	1.25	12270	1.62	32000	12,748	3.51	4.39	1.78	0.0	6.2	3.8	1.47	4.69	3.80	7.29	6.20	9.55	3.4
Apr-05	0	0	0.00%	175%	0.00	0.00	0.0	1.25	13110	1.65	32000	13,667	3.80	4.75	4.45	1.0	8.2	5.0	2.07	6.13	4.97	8.46	7.00	10.20	4.6
May-05	0	0	0.00%	170%	0.00	0.00	0.0	1.25	14120	1.68	32000	16,000	4.97	6.22	4.32	2.0	8.5	5.1	2.47	6.06	5.08	8.56	7.07	10.26	5.5
Jun-05	0	0	0.00%	150%	0.00	0.00	0.0	1.25	15045	1.71	32000	17,531	5.08	6.35	3.81	3.0	7.2	4.2	2.24	4.93	4.20	7.70	6.48	9.79	4.6
Jul-05	0	0	0.00%	40%	0.00	0.00	0.0	1.25	15261	1.71	32000	8,477	4.20	5.25	1.02	3.0	3.3	1.9	0.49	2.77	1.90	4.99	4.54	8.05	1.7
Aug-05	0	0	0.00%	60%	0.00	0.00	0.0	1.25	14863	1.70	32000	17,738	1.90	2.38	1.53	3.0	0.9	0.5	0.29	0.62	0.53	2.48	2.56	5.87	0.5
Sep-05	0	0	0.00%	150%	0.00	0.00	0.0	1.25	15820	1.73	32000	24,395	0.53	0.67	3.81	3.0	1.5	0.9	0.63	0.85	0.86	3.21	3.17	6.60	0.2
Oct-05	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15681	1.73	32000	21,915	0.86	1.07	1.91	2.0	1.0	0.6	0.38	0.60	0.57	2.56	2.63	5.96	0.3
Nov-05	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15693	1.73	32000	17,253	0.57	0.71	1.91	0.0	2.6	1.5	0.79	1.82	1.51	4.40	4.10	7.60	1.2
Dec-05	0	0	0.00%	100%	0.00	0.00	0.0	1.25	14884	1.70	32000	14,961	1.51	1.89	2.54	0.0	4.4	2.6	1.19	3.25	2.60	5.92	5.23	8.69	2.6
Jan-06	0	0	0.00%	60%	0.00	0.00	0.0	1.25	15834	1.73	32000	15,041	2.60	3.26	1.68	0.0	4.9	2.9	1.30	3.63	2.85	6.23	5.45	8.89	2.8
Feb-06	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15354	1.72	32000	15,114	2.85	3.56	2.10	0.0	5.7	3.3	1.52	4.15	3.30	6.75	5.82	9.22	3.0
Mar-06	0	0	0.00%	70%	0.00	0.00	0.0	1.25	15868	1.73	32000	19,356	3.30	4.13	1.96	0.0	6.1	3.5	2.07	4.02	3.51	6.99	5.99	9.36	3.3
Apr-06	0	0	0.00%	175%	0.00	0.00	0.0	1.25	16703	1.76	32000	17,439	3.51	4.39	4.91	1.0	8.3	4.7	2.50	5.80	4.72	8.22	6.84	10.07	4.6
May-06	0	0	0.00%	170%	0.00	0.00	0.0	1.25	19725	1.85	32000	20,203	4.72	5.90	4.77	2.0	8.7	4.7	2.88	5.79	4.69	8.18	6.81	10.06	3.7
Jun-06	0	0	0.00%	150%	0.00	0.00	0.0	1.25	18582	1.82	32000	27,717	4.69	5.86	4.21	3.0	7.1	3.9	3.28	3.78	3.89	7.39	6.27	9.60	1.4
Jul-06	0	0	0.00%	40%	0.00	0.00	0.0	1.25	17967	1.80	32000	22,154	3.89	4.86	1.12	3.0	3.0	1.7	1.12	1.87	1.66	4.63	4.27	7.78	0.2
Aug-06	0	0	0.00%	60%	0.00	0.00	0.0	1.25	18849	1.82	32000	18,801	1.66	2.08	1.68	3.0	0.8	0.4	0.24	0.52	0.42	2.16	2.29	5.52	0.5
Sep-06	0	0	0.00%	150%	0.00	0.00	0.0	1.25	19580	1.85	32000	25,748	0.42	0.52	4.21	3.0	1.7	0.9	0.73	0.99	0.94	3.37	3.30	6.75	1.0
Oct-06	0	0	0.00%	75%	0.00	0.00	0.0	1.25	19166	1.83	32000	26,010	0.94	1.17	2.10	2.0	1.3	0.7	0.55	0.72	0.69	2.86	2.88	6.27	1.1
Nov-06	0	0	0.00%	75%	0.00	0.00	0.0	1.25	20572	1.88	32000	23,981	0.69	0.87	2.10	0.0	3.0	1.6	1.16	1.82	1.58	4.51	4.18	7.69	1.5
Dec-06	0	0	0.00%	100%	0.00	0.00	0.0	1.25	18831	1.82	32000	19,976	1.58	1.98	2.80	0.0	4.8	2.6	1.59	3.19	2.62	5.95	5.25	8.71	2.1
Jan-07	0	0	0.00%	60%	0.00	0.00	0.0	1.25	25900	2.04	32000	25.900	2.62	3.28	1.71	0.0	5.0	2.4	1.93	3.06	2.45	5.73	5.09	8.56	
Feb-07	0	0	0.00%	75%	0.00	0.00	0.0	1.25	25900	2.04	32000	25.900	2.45	3.06	2.13	0.0	5.2	2.5	2.01	3.19	2.55	5.86	5.18	8.65	
Mar-07	0	0	0.00%	70%	0.00	0.00	0.0	1.25	25900	2.04	32000	25.900	2.55	3.19	1.99	0.0	5.2	2.5	2.00	3.18	2.54	5.85	5.17	8.64	
Apr-07	0	0	0.00%	175%	0.00	0.00	0.0	1.25	25900	2.04	32000	25.900	2.54	3.18	4.98	1.0	7.2	3.5	2.77	4.39	3.51	6.99	5.98	9.36	
May-07	0	0	0.00%	170%	0.00	0.00	0.0	1.25	25900	2.04	45000	25.900	3.51	4.39	4.84	2.0	7.2	3.5	2.79	4.43	3.55	7.02	6.01	9.39	

WLWB Ammonia Model - Drainage to Underground Mine

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154						
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)
Jun-07	17,200	408	2.794%	150%	17.11	3.03	5.8		500	400	0.924%	150%	5.54	0.98	64.6	8,200	33	2.94%	150%	1.43	0.25	1.0
Jul-07	1,720	408	0.924%	40%	1.51	0.27	5.1		500	400	0.924%	40%	1.48	0.26	17.2	15,580	33	2.94%	40%	0.38	0.07	0.1
Aug-07	1,720	408	0.924%	60%	2.26	0.40	7.7		500	400	0.924%	60%	2.22	0.39	25.8	15,580	33	2.94%	60%	0.57	0.10	0.2
Sep-07	1,720	408	0.924%	150%	5.66	1.00	19.2		500	400	0.924%	150%	5.54	0.98	64.6	15,580	33	2.94%	150%	1.43	0.25	0.5
Oct-07	1,720	408	0.924%	75%	2.83	0.50	9.6		500	400	0.924%	75%	2.77	0.49	32.3	15,560	33	2.94%	75%	0.72	0.13	0.3
Nov-07	1,720	408	0.924%	75%	2.83	0.50	9.6		500	400	0.924%	75%	2.77	0.49	32.3	15,560	33	2.94%	75%	0.72	0.13	0.3
Dec-07	1,720	408	0.924%	100%	3.77	0.67	12.8		500	400	0.924%	100%	3.70	0.65	43.0	15,560	33	2.94%	100%	0.96	0.17	0.4
Jan-08	895	90	0.924%	60%	0.50	0.09	3.2		500	808	0.924%	60%	4.48	0.79	52.2	46,740	28	2.94%	60%	0.50	0.09	0.1
Feb-08	895	90	0.924%	75%	0.62	0.11	4.1		500	808	0.924%	75%	5.60	0.99	65.2	46,740	28	2.94%	75%	0.62	0.11	0.1
Mar-08	895	90	0.924%	70%	0.58	0.10	3.8		500	808	0.924%	70%	5.23	0.93	60.9	46,740	28	2.94%	70%	0.58	0.10	0.1
Apr-08	895	90	0.924%	175%	1.46	0.26	9.5		500	808	0.924%	175%	13.07	2.32	152.2	46,740	28	2.94%	175%	1.46	0.26	0.2
May-08	895	90	0.924%	170%	1.41	0.25	9.2		500	808	0.924%	170%	12.70	2.25	147.9	46,740	28	2.94%	170%	1.42	0.25	0.2
Jun-08	895	90	0.924%	150%	1.25	0.22	8.1		500	808	0.924%	150%	11.20	1.99	130.5	46,740	28	2.94%	150%	1.25	0.22	0.2
Jul-08	895	90	0.924%	40%	0.33	0.06	2.2		500	808	0.924%	40%	2.99	0.53	34.8	46,740	28	2.94%	40%	0.33	0.06	0.0
Aug-08	895	90	0.924%	60%	0.50	0.09	3.2		500	808	0.924%	60%	4.48	0.79	52.2	46,740	28	2.94%	60%	0.50	0.09	0.1
Sep-08	895	90	0.924%	150%	1.25	0.22	8.1		500	808	0.924%	150%	11.20	1.99	130.5	46,740	28	2.94%	150%	1.25	0.22	0.2
Oct-08	895	90	0.924%	75%	0.62	0.11	4.1		500	808	0.924%	75%	5.60	0.99	65.2	46,740	28	2.94%	75%	0.62	0.11	0.1
Nov-08	895	90	0.924%	75%	0.62	0.11	4.1		500	808	0.924%	75%	5.60	0.99	65.2	46,740	28	2.94%	75%	0.62	0.11	0.1
Dec-08	895	90	0.924%	100%	0.83	0.15	5.4		500	808	0.924%	100%	7.47	1.32	87.0	46,740	28	2.94%	100%	0.83	0.15	0.1
Jan-09	700	0	0.924%	60%	0.00	0.00	0.0		500	600	0.924%	60%	3.33	0.59	38.7	40,900	18	2.94%	60%	0.31	0.05	0.0
Feb-09	700	0	0.924%	75%	0.00	0.00	0.0		500	600	0.924%	75%	4.16	0.74	48.4	40,900	18	2.94%	75%	0.39	0.07	0.1
Mar-09	700	0	0.924%	70%	0.00	0.00	0.0		500	600	0.924%	70%	3.88	0.69	45.2	40,900	18	2.94%	70%	0.36	0.06	0.1
Apr-09	700	0	0.924%	175%	0.00	0.00	0.0		500	600	0.924%	175%	9.70	1.72	113.0	40,900	18	2.94%	175%	0.90	0.16	0.1
May-09	700	0	0.924%	170%	0.00	0.00	0.0		500	600	0.924%	170%	9.42	1.67	109.8	40,900	18	2.94%	170%	0.87	0.16	0.1
Jun-09	700	0	0.924%	150%	0.00	0.00	0.0		500	600	0.924%	150%	8.32	1.47	96.8	40,900	18	2.94%	150%	0.77	0.14	0.1
Jul-09	700	0	0.924%	40%	0.00	0.00	0.0		500	600	0.924%	40%	2.22	0.39	25.8	40,900	18	2.94%	40%	0.21	0.04	0.0
Aug-09	700	0	0.924%	60%	0.00	0.00	0.0		500	600	0.924%	60%	3.33	0.59	38.7	40,900	18	2.94%	60%	0.31	0.05	0.0
Sep-09	700	0	0.924%	150%	0.00	0.00	0.0		500	600	0.924%	150%	8.32	1.47	96.8	40,900	18	2.94%	150%	0.77	0.14	0.1
Oct-09	700	0	0.924%	75%	0.00	0.00	0.0		500	600	0.924%	75%	4.16	0.74	48.4	40,900	18	2.94%	75%	0.39	0.07	0.1
Nov-09	700	0	0.924%	75%	0.00	0.00	0.0		500	600	0.924%	75%	4.16	0.74	48.4	40,900	18	2.94%	75%	0.39	0.07	0.1
Dec-09	700	0	0.924%	100%	0.00	0.00	0.0		500	600	0.924%	100%	5.54	0.98	64.6	40,900	18	2.94%	100%	0.51	0.09	0.1
Jan-10	700	0	0.924%	60%	0.00	0.00	0.0		500	183	0.924%	60%	1.02	0.18	11.8	39,200	11	2.94%	60%	0.19	0.03	0.0
Feb-10	700	0	0.924%	75%	0.00	0.00	0.0		500	183	0.924%	75%	1.27	0.23	14.8	39,200	11	2.94%	75%	0.24	0.04	0.0
Mar-10	700	0	0.924%	70%	0.00	0.00	0.0		500	183	0.924%	70%	1.19	0.21	13.8	39,200	11	2.94%	70%	0.22	0.04	0.0
Apr-10	700	0	0.924%	175%	0.00	0.00	0.0		500	183	0.924%	175%	2.96	0.53	34.5	39,200	11	2.94%	175%	0.56	0.10	0.1
May-10	700	0	0.924%	170%	0.00	0.00	0.0		500	183	0.924%	170%	2.88	0.51	33.5	39,200	11	2.94%	170%	0.55	0.10	0.1
Jun-10	700	0	0.924%	150%	0.00	0.00	0.0		500	183	0.924%	150%	2.54	0.45	29.6	39,200	11	2.94%	150%	0.48	0.09	0.1
Jul-10	700	0	0.924%	40%	0.00	0.00	0.0		500	183	0.924%	40%	0.68	0.12	7.9	39,200	11	2.94%	40%	0.13	0.02	0.0
Aug-10	700	0	0.924%	60%	0.00	0.00	0.0		500	183	0.924%	60%	1.02	0.18	11.8	39,200	11	2.94%	60%	0.19	0.03	0.0
Sep-10	700	0	0.924%	150%	0.00	0.00	0.0		500	183	0.924%	150%	2.54	0.45	29.6	39,200	11	2.94%	150%	0.48	0.09	0.1
Oct-10	700	0	0.924%	75%	0.00	0.00	0.0		500	183	0.924%	75%	1.27	0.23	14.8	39,200	11	2.94%	75%	0.24	0.04	0.0
Nov-10	700	0	0.924%	75%	0.00	0.00	0.0		500	183	0.924%	75%	1.27	0.23	14.8	39,200	11	2.94%	75%	0.24	0.04	0.0
Dec-10	700	0	0.924%	100%	0.00	0.00	0.0		500	183	0.924%	100%	1.69	0.30	19.7	39,200	11	2.94%	100%	0.32	0.06	0.0
Jan-11	700	0	0.924%	60%	0.00	0.00	0.0		500	23	0.924%	60%	0.13	0.02	1.5	37,400	33	2.94%	60%	0.57	0.10	0.1
Feb-11	700	0	0.924%	75%	0.00	0.00	0.0		500	23	0.924%	75%	0.16	0.03	1.9	37,400	33	2.94%	75%	0.72	0.13	0.1
Mar-11	700	0	0.924%	70%	0.00	0.00	0.0		500	23	0.924%	70%	0.15	0.03	1.8	37,400	33	2.94%	70%	0.67	0.12	0.1
Apr-11	700	0	0.924%	175%	0.00	0.00	0.0		500	23	0.924%	175%	0.38	0.07	4.4	37,400	33	2.94%	175%	1.67	0.30	0.3
May-11	700	0	0.924%	170%	0.00	0.00	0.0		500	23	0.924%	170%	0.37	0.06	4.3	37,400	33	2.94%	170%	1.62	0.29	0.3
Jun-11	700	0	0.924%	150%	0.00	0.00	0.0		500	23	0.924%	150%	0.32	0.06	3.8	37,400	33	2.94%	150%	1.43	0.25	0.2
Jul-11	700	0	0.924%	40%	0.00	0.00	0.0		500	23	0.924%	40%	0.09	0.02	1.0	37,400	33	2.94%	40%	0.38	0.07	0.1
Aug-11	700	0	0.924%	60%	0.00	0.00	0.0		500	23	0.924%	60%	0.13	0.02	1.5	37,400	33	2.94%	60%	0.57	0.10	0.1
Sep-11	700	0	0.924%	150%	0.00	0.00	0.0		500	23	0.924%	150%	0.32	0.06	3.8	37,400	33	2.94%	150%	1.43	0.25	0.2
Oct-11	700	0	0.924%	75%	0.00	0.00	0.0		500	23	0.924%	75%	0.16	0.03	1.9	37,400	33	2.94%	75%	0.72	0.13	0.1

	SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Jun-07	0	0	0.00%	150%	0.00	0.00	0.0	1.25	25900	2.04	45000	25,900	3.55	4.43	4.27	3.0	5.7	2.8	2.20	3.50	2.80	6.16	5.40	8.85	
Jul-07	0	0	0.00%	40%	0.00	0.00	0.0	1.25	17800	1.79	45000	17,800	2.80	3.50	0.60	3.0	1.1	0.6	0.33	0.76	0.61	2.67	2.72	6.07	
Aug-07	0	0	0.00%	60%	0.00	0.00	0.0	1.25	17800	1.79	45000	17,800	0.61	0.76	0.90	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-07	0	0	0.00%	150%	0.00	0.00	0.0	1.25	17800	1.79	45000	17,800	0.00	0.00	2.24	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-07	0	0	0.00%	75%	0.00	0.00	0.0	1.25	17800	1.79	45000	17,800	0.00	0.00	1.12	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-07	0	0	0.00%	75%	0.00	0.00	0.0	1.25	17800	1.79	45000	17,800	0.00	0.00	1.12	0.0	1.1	0.6	0.34	0.78	0.63	2.70	2.75	6.11	
Dec-07	0	0	0.00%	100%	0.00	0.00	0.0	1.25	17800	1.79	45000	17,800	0.63	0.78	1.49	0.0	2.3	1.3	0.69	1.59	1.27	3.99	3.79	7.28	
Jan-08	0	0	0.00%	60%	0.00	0.00	0.0	1.25	48135	2.71	45000	48,135	1.27	1.59	0.97	0.0	2.6	0.9	1.38	1.18	0.94	3.39	3.31	6.76	
Feb-08	0	0	0.00%	75%	0.00	0.00	0.0	1.25	48135	2.71	45000	48,135	0.94	1.18	1.21	0.0	2.4	0.9	1.29	1.10	0.88	3.27	3.21	6.65	
Mar-08	0	0	0.00%	70%	0.00	0.00	0.0	1.25	48135	2.71	45000	48,135	0.88	1.10	1.13	0.0	2.2	0.8	1.21	1.03	0.82	3.15	3.12	6.54	
Apr-08	0	0	0.00%	175%	0.00	0.00	0.0	1.25	48135	2.71	45000	48,135	0.82	1.03	2.83	1.0	2.9	1.1	1.54	1.32	1.05	3.60	3.48	6.95	
May-08	0	0	0.00%	170%	0.00	0.00	0.0	1.25	48135	2.71	45000	48,135	1.05	1.32	2.75	2.0	2.1	0.8	1.12	0.95	0.76	3.02	3.01	6.42	
Jun-08	0	0	0.00%	150%	0.00	0.00	0.0	1.25	48135	2.71	45000	48,135	0.76	0.95	2.43	3.0	0.4	0.1	0.21	0.18	0.14	1.19	1.41	4.22	
Jul-08	0	0	0.00%	40%	0.00	0.00	0.0	1.25	48135	2.71	45000	48,135	0.14	0.18	0.65	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-08	0	0	0.00%	60%	0.00	0.00	0.0	1.25	48135	2.71	45000	48,135	0.00	0.00	0.97	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-08	0	0	0.00%	150%	0.00	0.00	0.0	1.25	48135	2.71	45000	48,135	0.00	0.00	2.43	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-08	0	0	0.00%	75%	0.00	0.00	0.0	1.25	48135	2.71	45000	48,135	0.00	0.00	1.21	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-08	0	0	0.00%	75%	0.00	0.00	0.0	1.25	48135	2.71	45000	48,135	0.00	0.00	1.21	0.0	1.2	0.4	0.65	0.56	0.45	2.25	2.37	5.62	
Dec-08	0	0	0.00%	100%	0.00	0.00	0.0	1.25	48135	2.71	45000	48,135	0.45	0.56	1.62	0.0	2.2	0.8	1.17	1.00	0.80	3.10	3.08	6.50	
Jan-09	0	0	0.00%	60%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.80	1.00	0.64	0.0	1.6	0.7	0.83	0.81	0.65	2.76	2.80	6.17	
Feb-09	0	0	0.00%	75%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.65	0.81	0.81	0.0	1.6	0.6	0.82	0.80	0.64	2.74	2.78	6.14	
Mar-09	0	0	0.00%	70%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.64	0.80	0.75	0.0	1.6	0.6	0.78	0.77	0.61	2.67	2.73	6.08	
Apr-09	0	0	0.00%	175%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.61	0.77	1.88	1.0	1.6	0.7	0.83	0.81	0.65	2.76	2.80	6.17	
May-09	0	0	0.00%	170%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.65	0.81	1.83	2.0	0.6	0.3	0.32	0.32	0.25	1.64	1.83	4.88	
Jun-09	0	0	0.00%	150%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.25	0.32	1.61	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-09	0	0	0.00%	40%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.00	0.00	0.43	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-09	0	0	0.00%	60%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.00	0.00	0.64	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-09	0	0	0.00%	150%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.00	0.00	1.61	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-09	0	0	0.00%	75%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.00	0.00	0.81	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-09	0	0	0.00%	75%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.00	0.00	0.81	0.0	0.8	0.3	0.41	0.40	0.32	1.86	2.03	5.17	
Dec-09	0	0	0.00%	100%	0.00	0.00	0.0	1.25	42100	2.53	60000	42,100	0.32	0.40	1.07	0.0	1.5	0.6	0.74	0.73	0.58	2.60	2.66	6.00	
Jan-10	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.58	0.73	0.21	0.0	0.9	0.4	0.47	0.47	0.38	2.05	2.20	5.40	
Feb-10	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.38	0.47	0.27	0.0	0.7	0.3	0.37	0.37	0.30	1.80	1.98	5.09	
Mar-10	0	0	0.00%	70%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.30	0.37	0.25	0.0	0.6	0.3	0.31	0.31	0.25	1.64	1.83	4.88	
Apr-10	0	0	0.00%	175%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.25	0.31	0.62	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-10	0	0	0.00%	170%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.00	0.00	0.61	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-10	0	0	0.00%	150%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.00	0.00	0.54	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-10	0	0	0.00%	40%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.00	0.00	0.14	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-10	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.00	0.00	0.21	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-10	0	0	0.00%	150%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.00	0.00	0.54	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-10	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.00	0.00	0.27	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-10	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.00	0.00	0.27	0.0	0.3	0.1	0.13	0.14	0.11	1.03	1.25	3.96	
Dec-10	0	0	0.00%	100%	0.00	0.00	0.0	1.25	40400	2.48	60000	40,400	0.11	0.14	0.36	0.0	0.5	0.2	0.24	0.25	0.20	1.44	1.64	4.60	
Jan-11	0	0	0.00%	60%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.20	0.25	0.12	0.0	0.4	0.2	0.18	0.19	0.15	1.25	1.46	4.32	
Feb-11	0	0	0.00%	75%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.15	0.19	0.16	0.0	0.3	0.1	0.17	0.18	0.14	1.20	1.42	4.24	
Mar-11	0	0	0.00%	70%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.14	0.18	0.15	0.0	0.3	0.1	0.16	0.17	0.13	1.16	1.38	4.17	
Apr-11	0	0	0.00%	175%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.13	0.17	0.36	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-11	0	0	0.00%	170%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.35	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-11	0	0	0.00%	150%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.31	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-11	0	0	0.00%	40%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-11	0	0	0.00%	60%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-11	0	0	0.00%	150%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.31	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-11	0	0	0.00%	75%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.16	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Drainage to Underground Mine

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Nov-11	700	0	0.924%	75%	0.00	0.00	0.0		500	23	0.924%	75%	0.16	0.03	1.9	37,400	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.16	0.0	0.2	0.1	0.08	0.08	0.06	0.77	0.99	3.48	
Dec-11	700	0	0.924%	100%	0.00	0.00	0.0		500	23	0.924%	100%	0.22	0.04	2.5	37,400	33	2.94%	100%	0.96	0.17	0.1	0	0	0.00%	100%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.06	0.08	0.21	0.0	0.3	0.1	0.14	0.15	0.12	1.08	1.30	4.05	
Jan-12	700	0	0.924%	60%	0.00	0.00	0.0		500	1	0.924%	60%	0.01	0.00	0.1	37,350	30	2.94%	60%	0.53	0.09	0.1	2,100	190	0.92%	60%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.12	0.15	0.41	0.0	0.6	0.2	0.28	0.28	0.22	1.53	1.73	4.73	
Feb-12	700	0	0.924%	75%	0.00	0.00	0.0		500	1	0.924%	75%	0.01	0.00	0.1	37,350	30	2.94%	75%	0.66	0.12	0.1	2,100	190	0.92%	75%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.22	0.28	0.43	0.0	0.7	0.3	0.35	0.36	0.28	1.75	1.93	5.03	
Mar-12	700	0	0.924%	70%	0.00	0.00	0.0		500	1	0.924%	70%	0.01	0.00	0.1	37,350	30	2.94%	70%	0.62	0.11	0.1	2,100	190	0.92%	70%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.28	0.36	0.42	0.0	0.8	0.3	0.39	0.39	0.31	1.85	2.02	5.15	
Apr-12	700	0	0.924%	175%	0.00	0.00	0.0		500	1	0.924%	175%	0.02	0.00	0.2	37,350	30	2.94%	175%	1.54	0.27	0.2	2,100	190	0.92%	175%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.31	0.39	0.59	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-12	700	0	0.924%	170%	0.00	0.00	0.0		500	1	0.924%	170%	0.02	0.00	0.2	37,350	30	2.94%	170%	1.50	0.27	0.2	2,100	190	0.92%	170%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.00	0.00	0.58	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-12	700	0	0.924%	150%	0.00	0.00	0.0		500	1	0.924%	150%	0.02	0.00	0.2	37,350	30	2.94%	150%	1.32	0.23	0.2	2,100	190	0.92%	150%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.00	0.00	0.55	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-12	700	0	0.924%	40%	0.00	0.00	0.0		500	1	0.924%	40%	0.00	0.00	0.1	37,350	30	2.94%	40%	0.35	0.06	0.1	2,100	190	0.92%	40%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.00	0.00	0.37	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-12	700	0	0.924%	60%	0.00	0.00	0.0		500	1	0.924%	60%	0.01	0.00	0.1	37,350	30	2.94%	60%	0.53	0.09	0.1	2,100	190	0.92%	60%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.00	0.00	0.41	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-12	700	0	0.924%	150%	0.00	0.00	0.0		500	1	0.924%	150%	0.02	0.00	0.2	37,350	30	2.94%	150%	1.32	0.23	0.2	2,100	190	0.92%	150%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.00	0.00	0.55	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-12	700	0	0.924%	75%	0.00	0.00	0.0		500	1	0.924%	75%	0.01	0.00	0.1	37,350	30	2.94%	75%	0.66	0.12	0.1	2,100	190	0.92%	75%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.00	0.00	0.43	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-12	700	0	0.924%	75%	0.00	0.00	0.0		500	1	0.924%	75%	0.01	0.00	0.1	37,350	30	2.94%	75%	0.66	0.12	0.1	2,100	190	0.92%	75%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.00	0.00	0.43	0.0	0.4	0.2	0.21	0.22	0.17	1.33	1.54	4.44	
Dec-12	700	0	0.924%	100%	0.00	0.00	0.0		500	1	0.924%	100%	0.01	0.00	0.1	37,350	30	2.94%	100%	0.88	0.16	0.1	2,100	190	0.92%	100%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.17	0.22	0.47	0.0	0.7	0.3	0.34	0.34	0.28	1.72	1.90	4.99	
Jan-13	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	37,300	17	2.94%	60%	0.29	0.05	0.0	4,500	376	1.60%	60%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.28	0.34	1.12	0.0	1.5	0.6	0.75	0.71	0.57	2.57	2.64	5.97	
Feb-13	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	37,300	17	2.94%	75%	0.37	0.07	0.1	4,500	376	1.60%	75%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.57	0.71	1.13	0.0	1.8	0.7	0.94	0.90	0.72	2.92	2.93	6.33	
Mar-13	700	0	0.924%	70%	0.00	0.00	0.0		500	0	0.924%	70%	0.00	0.00	0.0	37,300	17	2.94%	70%	0.34	0.06	0.1	4,500	376	1.60%	70%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.72	0.90	1.12	0.0	2.0	0.8	1.04	0.99	0.79	3.08	3.06	6.48	
Apr-13	700	0	0.924%	175%	0.00	0.00	0.0		500	0	0.924%	175%	0.00	0.00	0.0	37,300	17	2.94%	175%	0.86	0.15	0.1	4,500	376	1.60%	175%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.79	0.99	1.22	1.0	1.2	0.5	0.62	0.59	0.47	2.31	2.42	5.70	
May-13	700	0	0.924%	170%	0.00	0.00	0.0		500	0	0.924%	170%	0.00	0.00	0.0	37,300	17	2.94%	170%	0.83	0.15	0.1	4,500	376	1.60%	170%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.47	0.59	1.21	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-13	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	37,300	17	2.94%	150%	0.74	0.13	0.1	4,500	376	1.60%	150%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.00	0.00	1.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-13	700	0	0.924%	40%	0.00	0.00	0.0		500	0	0.924%	40%	0.00	0.00	0.0	37,300	17	2.94%	40%	0.20	0.03	0.0	4,500	376	1.60%	40%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.00	0.00	1.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-13	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	37,300	17	2.94%	60%	0.29	0.05	0.0	4,500	376	1.60%	60%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.00	0.00	1.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-13	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	37,300	17	2.94%	150%	0.74	0.13	0.1	4,500	376	1.60%	150%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.00	0.00	1.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-13	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	37,300	17	2.94%	75%	0.37	0.07	0.1	4,500	376	1.60%	75%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.00	0.00	1.13	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-13	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	37,300	17	2.94%	75%	0.37	0.07	0.1	4,500	376	1.60%	75%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.00	0.00	1.13	0.0	1.1	0.4	0.58	0.55	0.44	2.23	2.35	5.60	
Dec-13	700	0	0.924%	100%	0.00	0.00	0.0		500	0	0.924%	100%	0.00	0.00	0.0	37,300	17	2.94%	100%	0.49	0.09	0.1	4,500	376	1.60%	100%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.44	0.55	1.15	0.0	1.7	0.7	0.87	0.83	0.67	2.80	2.83	6.20	
Jan-14	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	38,950	21	2.94%	60%	0.37	0.07	0.1	7,200	468	1.98%	60%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.67	0.83	1.70	0.0	2.5	0.9	1.36	1.18	0.94	3.39	3.31	6.76	
Feb-14	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	38,950	21	2.94%	75%	0.46	0.08	0.1	7,200	468	1.98%	75%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.94	1.18	1.72	0.0	2.9	1.1	1.55	1.35	1.08	3.65	3.52	6.99	
Mar-14	700	0	0.924%	70%	0.00	0.00	0.0		500	0	0.924%	70%	0.00	0.00	0.0	38,950	21	2.94%	70%	0.43	0.08	0.1	7,200	468	1.98%	70%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	1.08	1.35	1.72	0.0	3.1	1.1	1.64	1.42	1.14	3.76	3.60	7.08	
Apr-14	700	0	0.924%	175%	0.00	0.00	0.0		500	0	0.924%	175%	0.00	0.00	0.0	38,950	21	2.94%	175%	1.07	0.19	0.2	7,200	468	1.98%	175%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	1.14	1.42	1.83	1.0	2.3	0.8	1.21	1.05	0.84	3.17	3.14	6.57	
May-14	700	0	0.924%	170%	0.00	0.00	0.0		500	0	0.924%	170%	0.00	0.00	0.0	38,950	21	2.94%	170%	1.04	0.18	0.2	7,200	468	1.98%	170%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.84	1.05	1.82	2.0	0.9	0.3	0.47	0.40	0.32	1.88	2.05	5.19	
Jun-14	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	38,950	21	2.94%	150%	0.92	0.16	0.1	7,200	468	1.98%	150%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.32	0.40	1.80	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-14	700	0	0.924%	40%	0.00	0.00	0.0		500	0	0.924%	40%	0.00	0.00	0.0	38,950	21	2.94%	40%	0.25	0.04	0.0	7,200	468	1.98%	40%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.00	0.00	1.68	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-14	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	38,950	21	2.94%	60%	0.37	0.07	0.1	7,200	468	1.98%	60%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.00	0.00	1.70	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-14	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	38,950	21	2.94%	150%	0.92	0.16	0.1	7,200	468	1.98%	150%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.00	0.00	1.80	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-14	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	38,950	21	2.94%	75%	0.46	0.08	0.1	7,200	468	1.98%	75%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.00	0.00	1.72	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-14	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	38,950	21	2.94%	75%	0.46	0.08	0.1	7,200	468	1.98%	75%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.00	0.00	1.72	0.0	1.7	0.6	0.92	0.80	0.64	2.74	2.78	6.14	
Dec-14	700	0	0.924%	100%	0.00	0.00	0.0		500	0	0.924%	100%	0.00	0.00	0.0	38,950	21	2.94%	100%	0.61	0.11	0.1	7,200	468	1.98%	100%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.64	0.80	1.75	0.0	2.5	0.9	1.36	1.18	0.95	3.40	3.32	6.77	
Jan-15	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	40,600	28	2.94%	60%	0.50	0.09	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.95	1.18	0.09	0.0	1.3	0.5	0.64	0.63	0.50	2.40	2.50	5.79	
Feb-15	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	40,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.50	0.63	0.11	0.0	0.7	0.3	0.37	0.37	0.29	1.79	1.96	5.07	
Mar-15	700	0	0.924%	70%	0.00	0.00	0.0		500	0	0.924%	70%	0.00	0.00	0.0	40,600	28	2.94%	70%	0.58	0.10	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.29	0.37	0.10	0.0	0.5	0.2	0.24	0.23	0.19	1.39	1.60	4.53	
Apr-15	700	0	0.924%	175%	0.00	0.00	0.0		500	0	0.924%	175%	0.00	0.00	0.0	40,600	28	2.94%	175%	1.46	0.26	0.2	0	0	0.00%	175%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.19	0.23	0.26	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-15	700	0	0.924%	170%	0.00	0.00	0.0		500	0	0.924%	170%	0.00	0.00	0.0	40,600	28	2.94%	170%	1.42	0.25	0.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.25	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-15	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	40,600	28	2.94%	150%	1.25	0.22	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-15	700	0	0.924%	40%	0.00	0.00	0.0		500	0	0.924%	40%	0.00	0.00	0.0	40,600	28	2.94%	40%	0.33	0.06	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-15	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	40,600	28	2.94%	60%	0.50	0.09	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.09	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-15	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	40,600	28	2.94%	150%	1.25	0.22	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-15	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	40,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.11	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-15	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	40,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.11	0.0	0.1	0.0	0.06	0.05	0.04	0.63	0.83	3.17	
Dec-15	700	0	0.924%	100%	0.00	0.00	0.0		500	0	0.924%	100%	0.00	0.00	0.0	40,600	28	2.94%	100%	0.83	0.15	0.1	0	0	0.00%	100%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.04	0.05	0.15	0.0	0.2	0.1	0.10	0.10	0.08	0.87	1.09	3.68	
Jan-16	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	40,000	31	2.94%	60%	0.54	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.08	0.10	0.10	0.0	0.2	0.1	0.10	0.10	0.08	0.86	1.08	3.66	
Feb-16	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	40,000	31	2.94%	75%	0.68	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.08	0.10	0.12	0.0	0.2	0.1	0.11	0.11	0.09	0.92	1.14	3.75	
Mar-16	700	0	0.924%	70%	0.00	0.00	0.0		500	0	0.924%	70%	0.00	0.00	0.0	40,000	31	2.94%	70%	0.63	0.11	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.09	0.11	0.11	0.0	0.2	0.1	0.11	0.11	0.09	0.92	1.14	3.77	

WLWB Ammonia Model - Drainage to Underground Mine

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Apr-16	700	0	0.924%	175%	0.00	0.00	0.0		500	0	0.924%	175%	0.00	0.00	0.0	40,000	31	2.94%	175%	1.59	0.28	0.2	0	0	0.00%	175%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.09	0.11	0.28	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-16	700	0	0.924%	170%	0.00	0.00	0.0		500	0	0.924%	170%	0.00	0.00	0.0	40,000	31	2.94%	170%	1.54	0.27	0.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.27	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-16	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	40,000	31	2.94%	150%	1.36	0.24	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.24	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-16	700	0	0.924%	40%	0.00	0.00	0.0		500	0	0.924%	40%	0.00	0.00	0.0	40,000	31	2.94%	40%	0.36	0.06	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-16	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	40,000	31	2.94%	60%	0.54	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-16	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	40,000	31	2.94%	150%	1.36	0.24	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.24	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-16	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	40,000	31	2.94%	75%	0.68	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.12	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-16	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	40,000	31	2.94%	75%	0.68	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.12	0.0	0.1	0.0	0.06	0.06	0.05	0.66	0.87	3.24	
Dec-16	700	0	0.924%	100%	0.00	0.00	0.0		500	0	0.924%	100%	0.00	0.00	0.0	40,000	31	2.94%	100%	0.91	0.16	0.1	0	0	0.00%	100%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.05	0.06	0.16	0.0	0.2	0.1	0.11	0.11	0.09	0.92	1.14	3.78	
Jan-17	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	39,500	38	2.94%	60%	0.66	0.12	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.09	0.11	0.12	0.0	0.2	0.1	0.11	0.11	0.09	0.94	1.16	3.80	
Feb-17	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	39,500	38	2.94%	75%	0.83	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.09	0.11	0.15	0.0	0.3	0.1	0.13	0.13	0.10	1.01	1.23	3.93	
Mar-17	700	0	0.924%	70%	0.00	0.00	0.0		500	0	0.924%	70%	0.00	0.00	0.0	39,500	38	2.94%	70%	0.77	0.14	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.10	0.13	0.14	0.0	0.3	0.1	0.13	0.13	0.11	1.03	1.25	3.95	
Apr-17	700	0	0.924%	175%	0.00	0.00	0.0		500	0	0.924%	175%	0.00	0.00	0.0	39,500	38	2.94%	175%	1.93	0.34	0.3	0	0	0.00%	175%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.11	0.13	0.34	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-17	700	0	0.924%	170%	0.00	0.00	0.0		500	0	0.924%	170%	0.00	0.00	0.0	39,500	38	2.94%	170%	1.87	0.33	0.3	0	0	0.00%	170%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.33	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-17	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	39,500	38	2.94%	150%	1.65	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-17	700	0	0.924%	40%	0.00	0.00	0.0		500	0	0.924%	40%	0.00	0.00	0.0	39,500	38	2.94%	40%	0.44	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-17	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	39,500	38	2.94%	60%	0.66	0.12	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-17	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	39,500	38	2.94%	150%	1.65	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-17	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	39,500	38	2.94%	75%	0.83	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.15	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-17	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	39,500	38	2.94%	75%	0.83	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.15	0.0	0.1	0.1	0.07	0.07	0.06	0.74	0.95	3.40	
Dec-17	700	0	0.924%	100%	0.00	0.00	0.0		500	0	0.924%	100%	0.00	0.00	0.0	39,500	38	2.94%	100%	1.10	0.20	0.2	0	0	0.00%	100%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.06	0.07	0.20	0.0	0.3	0.1	0.13	0.14	0.11	1.03	1.25	3.96	
Jan-18	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	39,000	37	2.94%	60%	0.65	0.11	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.11	0.14	0.11	0.0	0.2	0.1	0.12	0.13	0.10	0.99	1.21	3.89	
Feb-18	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	39,000	37	2.94%	75%	0.81	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.10	0.13	0.14	0.0	0.3	0.1	0.13	0.14	0.11	1.03	1.25	3.96	
Mar-18	700	0	0.924%	70%	0.00	0.00	0.0		500	0	0.924%	70%	0.00	0.00	0.0	39,000	37	2.94%	70%	0.75	0.13	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.11	0.14	0.13	0.0	0.3	0.1	0.13	0.14	0.11	1.04	1.26	3.97	
Apr-18	700	0	0.924%	175%	0.00	0.00	0.0		500	0	0.924%	175%	0.00	0.00	0.0	39,000	37	2.94%	175%	1.89	0.33	0.3	0	0	0.00%	175%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.11	0.14	0.33	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-18	700	0	0.924%	170%	0.00	0.00	0.0		500	0	0.924%	170%	0.00	0.00	0.0	39,000	37	2.94%	170%	1.83	0.32	0.3	0	0	0.00%	170%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.32	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-18	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	39,000	37	2.94%	150%	1.62	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-18	700	0	0.924%	40%	0.00	0.00	0.0		500	0	0.924%	40%	0.00	0.00	0.0	39,000	37	2.94%	40%	0.43	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-18	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	39,000	37	2.94%	60%	0.65	0.11	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.11	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-18	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	39,000	37	2.94%	150%	1.62	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-18	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	39,000	37	2.94%	75%	0.81	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.14	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-18	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	39,000	37	2.94%	75%	0.81	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.14	0.0	0.1	0.1	0.07	0.07	0.06	0.73	0.94	3.39	
Dec-18	700	0	0.924%	100%	0.00	0.00	0.0		500	0	0.924%	100%	0.00	0.00	0.0	39,000	37	2.94%	100%	1.08	0.19	0.2	0	0	0.00%	100%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.06	0.07	0.19	0.0	0.3	0.1	0.13	0.13	0.11	1.02	1.24	3.94	
Jan-19	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	38,500	33	2.94%	60%	0.57	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.11	0.13	0.10	0.0	0.2	0.1	0.12	0.12	0.10	0.96	1.18	3.84	
Feb-19	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	38,500	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.10	0.12	0.13	0.0	0.2	0.1	0.12	0.13	0.10	0.99	1.21	3.88	
Mar-19	700	0	0.924%	70%	0.00	0.00	0.0		500	0	0.924%	70%	0.00	0.00	0.0	38,500	33	2.94%	70%	0.67	0.12	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.10	0.13	0.12	0.0	0.2	0.1	0.12	0.12	0.10	0.98	1.20	3.87	
Apr-19	700	0	0.924%	175%	0.00	0.00	0.0		500	0	0.924%	175%	0.00	0.00	0.0	38,500	33	2.94%	175%	1.67	0.30	0.3	0	0	0.00%	175%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.10	0.12	0.30	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-19	700	0	0.924%	170%	0.00	0.00	0.0		500	0	0.924%	170%	0.00	0.00	0.0	38,500	33	2.94%	170%	1.62	0.29	0.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.29	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-19	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	38,500	33	2.94%	150%	1.43	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-19	700	0	0.924%	40%	0.00	0.00	0.0		500	0	0.924%	40%	0.00	0.00	0.0	38,500	33	2.94%	40%	0.38	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.07	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-19	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	38,500	33	2.94%	60%	0.57	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-19	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	38,500	33	2.94%	150%	1.43	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-19	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	38,500	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.13	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-19	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	38,500	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.13	0.0	0.1	0.1	0.06	0.06	0.05	0.69	0.90	3.30	
Dec-19	700	0	0.924%	100%	0.00	0.00	0.0		500	0	0.924%	100%	0.00	0.00	0.0	38,500	33	2.94%	100%	0.96	0.17	0.1	0	0	0.00%	100%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.05	0.06	0.17	0.0	0.2	0.1	0.11	0.12	0.10	0.96	1.18	3.83	
Jan-20	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	42,600	38	2.94%	60%	0.68	0.12	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.10	0.12	0.12	0.0	0.2	0.1	0.12	0.12	0.09	0.94	1.16	3.81	
Feb-20	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	42,600	38	2.94%	75%	0.85	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.09	0.12	0.15	0.0	0.3	0.1	0.14	0.13	0.10	1.00	1.22	3.91	
Mar-20	700	0	0.924%	70%	0.00	0.00	0.0		500	0	0.924%	70%	0.00	0.00	0.0	42,600	38	2.94%	70%	0.79	0.14	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.10	0.13	0.14	0.0	0.3	0.1	0.14	0.13	0.10	1.01	1.23	3.92	
Apr-20	700	0	0.924%	175%	0.00	0.00	0.0		500	0	0.924%	175%	0.00	0.00	0.0	42,600	38	2.94%	175%	1.97	0.35	0.3	0	0	0.00%	175%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.10	0.13	0.35	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-20	700	0	0.924%	170%	0.00	0.00	0.0		500	0	0.924%	170%	0.00	0.00	0.0	42,600	38	2.94%	170%	1.92	0.34	0.3	0	0	0.00%	170%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.34	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-20	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	42,600	38	2.94%	150%	1.69	0.30	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.30	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-20	700	0	0.924%	40%	0.00	0.00	0.0		500	0	0.924%	40%	0.00	0.00	0.0	42,600	38	2.94%	40%	0.45	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-20	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	42,600	38	2.94%	60%	0.68	0.12	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Drainage to Underground Mine

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammona concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Sep-20	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	42,600	38	2.94%	150%	1.69	0.30	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.30	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-20	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	42,600	38	2.94%	75%	0.85	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.15	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-20	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	42,600	38	2.94%	75%	0.85	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.15	0.0	0.1	0.1	0.08	0.07	0.06	0.73	0.94	3.39	
Dec-20	700	0	0.924%	100%	0.00	0.00	0.0		500	0	0.924%	100%	0.00	0.00	0.0	42,600	38	2.94%	100%	1.13	0.20	0.2	0	0	0.00%	100%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.06	0.07	0.20	0.0	0.3	0.1	0.14	0.13	0.11	1.02	1.24	3.93	
Jan-21	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	46,800	40	2.94%	60%	0.71	0.13	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.11	0.13	0.13	0.0	0.3	0.1	0.14	0.12	0.09	0.96	1.18	3.83	
Feb-21	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	46,800	40	2.94%	75%	0.88	0.16	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.09	0.12	0.16	0.0	0.3	0.1	0.15	0.13	0.10	0.99	1.21	3.89	
Mar-21	700	0	0.924%	70%	0.00	0.00	0.0		500	0	0.924%	70%	0.00	0.00	0.0	46,800	40	2.94%	70%	0.82	0.15	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.10	0.13	0.15	0.0	0.3	0.1	0.15	0.13	0.10	0.99	1.21	3.89	
Apr-21	700	0	0.924%	175%	0.00	0.00	0.0		500	0	0.924%	175%	0.00	0.00	0.0	46,800	40	2.94%	175%	2.06	0.36	0.3	0	0	0.00%	175%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.10	0.13	0.36	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-21	700	0	0.924%	170%	0.00	0.00	0.0		500	0	0.924%	170%	0.00	0.00	0.0	46,800	40	2.94%	170%	2.00	0.35	0.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.35	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-21	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	46,800	40	2.94%	150%	1.76	0.31	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.31	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-21	700	0	0.924%	40%	0.00	0.00	0.0		500	0	0.924%	40%	0.00	0.00	0.0	46,800	40	2.94%	40%	0.47	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-21	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	46,800	40	2.94%	60%	0.71	0.13	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-21	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	46,800	40	2.94%	150%	1.76	0.31	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.31	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-21	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	46,800	40	2.94%	75%	0.88	0.16	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.16	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-21	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	46,800	40	2.94%	75%	0.88	0.16	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.16	0.0	0.2	0.1	0.08	0.07	0.06	0.73	0.94	3.39	
Dec-21	700	0	0.924%	100%	0.00	0.00	0.0		500	0	0.924%	100%	0.00	0.00	0.0	46,800	40	2.94%	100%	1.18	0.21	0.1	0	0	0.00%	100%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.06	0.07	0.21	0.0	0.3	0.1	0.15	0.13	0.10	1.01	1.23	3.91	
Jan-22	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	42,200	32	2.94%	60%	0.56	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.10	0.13	0.10	0.0	0.2	0.1	0.12	0.11	0.09	0.92	1.14	3.77	
Feb-22	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	42,200	32	2.94%	75%	0.70	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.09	0.11	0.12	0.0	0.2	0.1	0.12	0.11	0.09	0.94	1.16	3.79	
Mar-22	700	0	0.924%	70%	0.00	0.00	0.0		500	0	0.924%	70%	0.00	0.00	0.0	42,200	32	2.94%	70%	0.65	0.12	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.09	0.11	0.12	0.0	0.2	0.1	0.12	0.11	0.09	0.93	1.15	3.77	
Apr-22	700	0	0.924%	175%	0.00	0.00	0.0		500	0	0.924%	175%	0.00	0.00	0.0	42,200	32	2.94%	175%	1.63	0.29	0.2	0	0	0.00%	175%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.09	0.11	0.29	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-22	700	0	0.924%	170%	0.00	0.00	0.0		500	0	0.924%	170%	0.00	0.00	0.0	42,200	32	2.94%	170%	1.58	0.28	0.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.28	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-22	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	42,200	32	2.94%	150%	1.40	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-22	700	0	0.924%	40%	0.00	0.00	0.0		500	0	0.924%	40%	0.00	0.00	0.0	42,200	32	2.94%	40%	0.37	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.07	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-22	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	42,200	32	2.94%	60%	0.56	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-22	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	42,200	32	2.94%	150%	1.40	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-22	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	42,200	32	2.94%	75%	0.70	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.12	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-22	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	42,200	32	2.94%	75%	0.70	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.12	0.0	0.1	0.0	0.06	0.06	0.05	0.66	0.87	3.24	
Dec-22	700	0	0.924%	100%	0.00	0.00	0.0		500	0	0.924%	100%	0.00	0.00	0.0	42,200	32	2.94%	100%	0.93	0.16	0.1	0	0	0.00%	100%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.05	0.06	0.16	0.0	0.2	0.1	0.12	0.11	0.09	0.92	1.14	3.76	
Jan-23	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	37,700	35	2.94%	60%	0.62	0.11	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.09	0.11	0.11	0.0	0.2	0.1	0.11	0.11	0.09	0.93	1.15	3.78	
Feb-23	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	37,700	35	2.94%	75%	0.77	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.09	0.11	0.14	0.0	0.2	0.1	0.12	0.13	0.10	1.00	1.22	3.90	
Mar-23	700	0	0.924%	70%	0.00	0.00	0.0		500	0	0.924%	70%	0.00	0.00	0.0	37,700	35	2.94%	70%	0.72	0.13	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.10	0.13	0.13	0.0	0.3	0.1	0.12	0.13	0.11	1.01	1.23	3.93	
Apr-23	700	0	0.924%	175%	0.00	0.00	0.0		500	0	0.924%	175%	0.00	0.00	0.0	37,700	35	2.94%	175%	1.80	0.32	0.3	0	0	0.00%	175%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.11	0.13	0.32	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-23	700	0	0.924%	170%	0.00	0.00	0.0		500	0	0.924%	170%	0.00	0.00	0.0	37,700	35	2.94%	170%	1.75	0.31	0.3	0	0	0.00%	170%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.31	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-23	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	37,700	35	2.94%	150%	1.54	0.27	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.27	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-23	700	0	0.924%	40%	0.00	0.00	0.0		500	0	0.924%	40%	0.00	0.00	0.0	37,700	35	2.94%	40%	0.41	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.07	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-23	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	37,700	35	2.94%	60%	0.62	0.11	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.11	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-23	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	37,700	35	2.94%	150%	1.54	0.27	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.27	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-23	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	37,700	35	2.94%	75%	0.77	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.14	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-23	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	37,700	35	2.94%	75%	0.77	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.14	0.0	0.1	0.1	0.07	0.07	0.06	0.72	0.93	3.36	
Dec-23	700	0	0.924%	100%	0.00	0.00	0.0		500	0	0.924%	100%	0.00	0.00	0.0	37,700	35	2.94%	100%	1.03	0.18	0.2	0	0	0.00%	100%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.06	0.07	0.18	0.0	0.3	0.1	0.12	0.13	0.10	1.01	1.23	3.92	
Jan-24	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	38,300	10	2.94%	60%	0.18	0.03	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.10	0.13	0.03	0.0	0.2	0.1	0.08	0.08	0.07	0.78	1.00	3.50	
Feb-24	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	38,300	10	2.94%	75%	0.22	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.07	0.08	0.04	0.0	0.1	0.0	0.06	0.06	0.05	0.67	0.88	3.26	
Mar-24	700	0	0.924%	70%	0.00	0.00	0.0		500	0	0.924%	70%	0.00	0.00	0.0	38,300	10	2.94%	70%	0.21	0.04	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.05	0.06	0.04	0.0	0.1	0.0	0.05	0.05	0.04	0.60	0.80	3.09	
Apr-24	700	0	0.924%	175%	0.00	0.00	0.0		500	0	0.924%	175%	0.00	0.00	0.0	38,300	10	2.94%	175%	0.51	0.09	0.1	0	0	0.00%	175%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.04	0.05	0.09	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-24	700	0	0.924%	170%	0.00	0.00	0.0		500	0	0.924%	170%	0.00	0.00	0.0	38,300	10	2.94%	170%	0.50	0.09	0.1	0	0	0.00%	170%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.09	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-24	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	38,300	10	2.94%	150%	0.44	0.08	0.1	0	0	0.00%	150%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-24	700	0	0.924%	40%	0.00	0.00	0.0		500	0	0.924%	40%	0.00	0.00	0.0	38,300	10	2.94%	40%	0.12	0.02	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.02	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-24	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	38,300	10	2.94%	60%	0.18	0.03	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.03	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-24	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	38,300	10	2.94%	150%	0.44	0.08	0.1	0	0	0.00%	150%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-24	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	38,300	10	2.94%	75%	0.22	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.04	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-24	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	38,300	10	2.94%	75%	0.22	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.04	0.0	0.0	0.0	0.02	0.02	0.02	0.36	0.53	2.46	
Dec-24	700	0	0.924%	100%	0.00	0.00	0.0		500	0	0.924%	100%	0.00	0.00	0.0	38,300	10	2.94%	100%	0.29	0.05	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.02	0.02	0.05	0.0	0.1	0.0	0.04	0.04	0.03	0.50	0.70	2.87	
Jan-25	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	38,900	0	2.94%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.03	0.04	0.00	0.0	0.0	0.0	0.02	0.02	0.01	0.35	0.51	2.42	

WLWB Ammonia Model - Drainage to Underground Mine

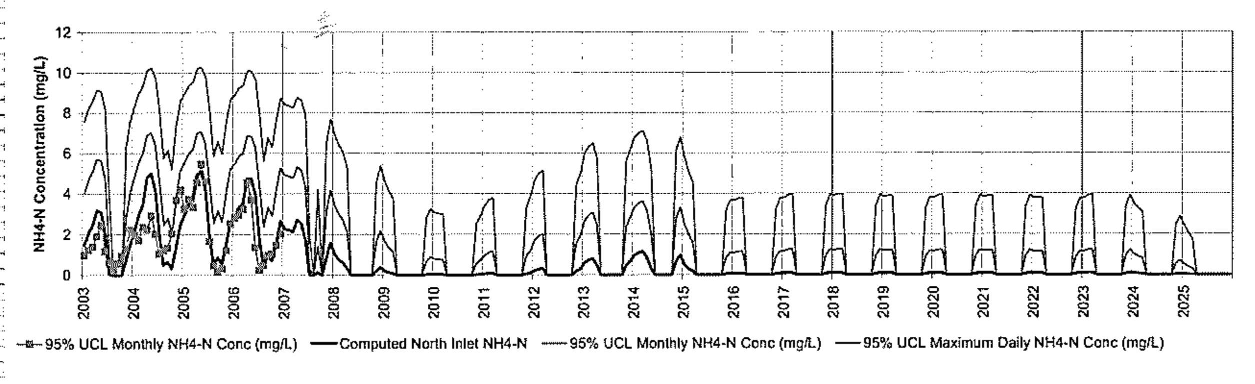
	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L	Actual NH4-N concentration (mg/L)
Feb-25	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	38,900	0	2.94%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.01	0.02	0.00	0.0	0.0	0.0	0.01	0.01	0.01	0.24	0.38	2.05	
Mar-25	700	0	0.924%	70%	0.00	0.00	0.0		500	0	0.924%	70%	0.00	0.00	0.0	38,900	0	2.94%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.01	0.01	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.16	0.28	1.73	
Apr-25	700	0	0.924%	175%	0.00	0.00	0.0		500	0	0.924%	175%	0.00	0.00	0.0	38,900	0	2.94%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-25	700	0	0.924%	170%	0.00	0.00	0.0		500	0	0.924%	170%	0.00	0.00	0.0	38,900	0	2.94%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-25	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	38,900	0	2.94%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-25	700	0	0.924%	40%	0.00	0.00	0.0		500	0	0.924%	40%	0.00	0.00	0.0	38,900	0	2.94%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-25	700	0	0.924%	60%	0.00	0.00	0.0		500	0	0.924%	60%	0.00	0.00	0.0	38,900	0	2.94%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-25	700	0	0.924%	150%	0.00	0.00	0.0		500	0	0.924%	150%	0.00	0.00	0.0	38,900	0	2.94%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-25	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	38,900	0	2.94%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-25	700	0	0.924%	75%	0.00	0.00	0.0		500	0	0.924%	75%	0.00	0.00	0.0	38,900	0	2.94%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-25	700	0	0.924%	100%	0.00	0.00	0.0		500	0	0.924%	100%	0.00	0.00	0.0	38,900	0	2.94%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - A418 to PKC Case

WLWB AMMONIA MANAGEMENT MODEL OF DIAVIK PROJECT

CASE:	**A418 Surface Mine Water to PKC**
BLASTING:	Current practices: open hole: 80/20 emulsion/ANFO mix; no liner; wet holes pumped and double primed; large area blasts
AN USE:	Past and future use as per Diavik ADP projections (SNC-Lavalin, Ammonia Balance, May 2006)
MINE INFLOW:	Actual to present, predicted inflows (Golder, 2006) in future.
WATER MANAGEMENT:	All mine water discharged to North Inlet except A418 water, which is discharged to the PKC system as makeup water.
TREATMENT:	No additional treatment; natural biological degradation in North Inlet to continue at current rate.
FLOW TO LAC DE GRAS:	Actual to present, future discharge equal to input in same month.

RESULTS	**FROM BEGINNING OF**	**03**	**07**	**08**
AMMONIA (N) TO LDG	**TO END OF**	**06**	**07**	**25**
	Average	2.3	1.3	0.1
	Maximum 30 Day	5.1	2.7	1.1
	Maximum 1 Day	8.6	6.1	3.8
	Maximum 95% UCL 30 Day	7.1	5.3	3.6
	Maximum 95% UCL 1 Day	10.3	8.8	7.1



WLWB Ammonia Model - A418 to PKC Case

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Jan-03	5,380	867	0.924%	60%	4.80	0.85	5.2	8.4	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	5380	1.41	32000	17,905	1.00	1.25	0.85	0.0	2.1	1.5	0.81	1.29	1.49	4.35	4.06	7.57	1.0
Feb-03	5,667	867	0.924%	75%	6.00	1.06	6.2	7.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	5667	1.42	32000	17,175	1.49	1.86	1.06	0.0	2.9	2.1	1.07	1.85	2.05	5.20	4.70	8.20	1.3
Mar-03	5,954	867	0.924%	70%	5.60	0.99	5.5	5.1	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	5954	1.43	32000	16,854	2.05	2.57	0.99	0.0	3.6	2.5	1.28	2.29	2.49	5.78	5.12	8.60	1.4
Apr-03	6,251	867	0.924%	175%	14.01	2.48	13.0	10.5	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	1.25	6251	1.44	32000	16,875	2.49	3.11	2.48	1.0	4.6	3.2	1.64	2.96	3.19	6.62	5.73	9.14	1.9
May-03	5,936	867	0.924%	170%	13.61	2.41	13.3	5.4	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	1.25	5936	1.43	32000	25,514	3.19	3.99	2.41	2.0	4.4	3.1	2.39	2.01	3.07	6.49	5.64	9.06	2.5
Jun-03	7,290	867	0.924%	150%	12.01	2.13	9.6	3.2	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	7290	1.47	32000	29,485	3.07	3.84	2.13	3.0	3.0	2.0	1.81	1.16	2.02	5.15	4.66	8.16	1.2
Jul-03	6,867	867	0.924%	40%	3.20	0.57	2.7	6.7	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	6867	1.46	32000	28,379	2.02	2.52	0.57	3.0	0.1	0.1	0.05	0.04	0.06	0.76	0.98	3.45	0.6
Aug-03	7,753	867	0.924%	60%	4.80	0.85	3.6	6.1	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	7753	1.49	32000	27,138	0.06	0.08	0.85	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.2
Sep-03	8,194	867	0.924%	150%	12.01	2.13	8.5	8.4	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	8194	1.50	32000	29,665	0.00	0.00	2.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.6
Oct-03	8,775	867	0.924%	75%	6.00	1.06	4.0	6.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	8775	1.52	32000	27,977	0.00	0.00	1.06	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.9
Nov-03	8,935	867	0.924%	75%	6.00	1.06	3.9	6.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	8935	1.52	32000	15,411	0.00	0.00	1.06	0.0	1.1	0.7	0.33	0.74	0.70	2.87	2.89	6.28	1.3
Dec-03	8,301	867	0.924%	100%	8.01	1.42	5.6	5.1	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	8301	1.50	32000	24,385	0.70	0.87	1.42	0.0	2.3	1.5	1.13	1.16	1.53	4.42	4.11	7.62	2.2
Jan-04	8,570	808	1.598%	60%	7.75	1.37	5.3	4.3	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	8570	1.51	32000	13,372	1.53	1.91	1.37	0.0	3.3	2.2	0.88	2.40	2.17	5.36	4.82	8.31	2.0
Feb-04	7,982	808	1.598%	75%	9.69	1.72	7.1	5.9	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	7982	1.49	32000	7,407	2.17	2.71	1.72	0.0	4.4	3.0	0.67	3.76	2.97	6.37	5.55	8.98	1.7
Mar-04	8,828	808	1.598%	70%	9.04	1.60	6.0	6.0	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	8828	1.52	32000	3,826	2.97	3.71	1.60	0.0	5.3	3.5	0.41	4.91	3.50	6.97	5.97	9.35	2.4
Apr-04	9,324	808	1.598%	175%	22.60	4.00	14.1	5.3	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	1.25	9324	1.53	32000	0	3.50	4.37	4.00	1.0	7.4	4.8	0.00	7.38	4.81	8.30	6.89	10.12	2.2
May-04	10,755	808	1.598%	170%	21.95	3.89	11.9	9.3	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	1.25	10755	1.58	32000	0	4.81	6.01	3.89	2.0	7.9	5.0	0.00	7.90	5.01	8.49	7.02	10.22	2.9
Jun-04	12,337	808	1.598%	150%	19.37	3.43	9.1	5.3	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	12337	1.63	32000	16,027	5.01	6.26	3.43	3.0	6.7	4.1	2.01	4.69	4.12	7.63	6.43	9.74	2.0
Jul-04	11,098	808	1.598%	40%	5.17	0.92	2.7	13.4	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	11098	1.59	32000	25,310	4.12	5.15	0.92	3.0	3.1	1.9	1.49	1.58	1.93	5.03	4.57	8.07	1.1
Aug-04	11,394	808	1.598%	60%	7.75	1.37	4.0	8.9	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	11394	1.60	32000	28,658	1.93	2.41	1.37	3.0	0.8	0.5	0.43	0.36	0.49	2.37	2.47	5.76	1.2
Sep-04	12,030	808	1.598%	150%	19.37	3.43	9.4	6.7	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	12030	1.62	32000	27,577	0.49	0.62	3.43	3.0	1.0	0.6	0.54	0.50	0.65	2.76	2.80	6.17	1.3
Oct-04	11,948	808	1.598%	75%	9.69	1.72	4.7	6.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11948	1.61	32000	13,563	0.65	0.81	1.72	2.0	0.5	0.3	0.14	0.39	0.33	1.89	2.06	5.20	2.1
Nov-04	11,300	808	1.598%	75%	9.69	1.72	5.0	7.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11300	1.59	32000	12,590	0.33	0.41	1.72	0.0	2.1	1.3	0.51	1.61	1.33	4.10	3.87	7.37	3.7
Dec-04	10,514	808	1.598%	100%	12.91	2.29	7.2	5.1	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	10514	1.57	32000	11,561	1.33	1.67	2.29	0.0	4.0	2.5	0.89	3.07	2.52	5.82	5.15	8.62	4.2
Jan-05	10,958	725	1.979%	60%	8.61	1.53	4.6	4.5	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	10958	1.58	32000	10,692	2.52	3.15	1.53	0.0	4.7	3.0	0.96	3.72	2.95	6.35	5.53	8.97	3.3
Feb-05	11,359	725	1.979%	75%	10.76	1.91	5.5	4.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11359	1.60	32000	12,385	2.95	3.69	1.91	0.0	5.6	3.5	1.32	4.28	3.51	6.98	5.98	9.36	3.7
Mar-05	12,270	725	1.979%	70%	10.04	1.78	4.8	5.8	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	12270	1.62	32000	12,748	3.51	4.39	1.78	0.0	6.2	3.8	1.47	4.69	3.80	7.29	6.20	9.55	3.4
Apr-05	13,110	725	1.979%	175%	25.11	4.45	11.2	11.5	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	1.25	13110	1.65	32000	13,667	3.80	4.75	4.45	1.0	8.2	5.0	2.07	6.13	4.97	8.46	7.00	10.20	4.6
May-05	14,120	725	1.979%	170%	24.39	4.32	10.1	11.7	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	1.25	14120	1.68	32000	16,000	4.97	6.22	4.32	2.0	8.5	5.1	2.47	6.06	5.08	8.56	7.07	10.26	5.5
Jun-05	15,045	725	1.979%	150%	21.52	3.81	8.3	10.7	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	15045	1.71	32000	17,531	5.08	6.35	3.81	3.0	7.2	4.2	2.24	4.93	4.20	7.70	6.48	9.79	4.6
Jul-05	15,261	725	1.979%	40%	5.74	1.02	2.2	5.1	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	15261	1.71	32000	8,477	4.20	5.25	1.02	3.0	3.3	1.9	0.49	2.77	1.90	4.93	4.54	8.05	1.7
Aug-05	14,863	725	1.979%	60%	8.61	1.53	3.4	3.3	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	14863	1.70	32000	17,738	1.90	2.38	1.53	3.0	0.9	0.5	0.29	0.62	0.53	2.48	2.56	5.87	0.5
Sep-05	15,820	725	1.979%	150%	21.52	3.81	7.9	2.2	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	15820	1.73	32000	24,395	0.53	0.67	3.81	3.0	1.5	0.9	0.63	0.85	0.86	3.21	3.17	6.60	0.2
Oct-05	15,681	725	1.979%	75%	10.76	1.91	4.0	2.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15681	1.73	32000	21,915	0.86	1.07	1.91	2.0	1.0	0.6	0.38	0.60	0.57	2.56	2.63	5.96	0.3
Nov-05	15,693	725	1.979%	75%	10.76	1.91	4.0	3.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15693	1.73	32000	17,253	0.57	0.71	1.91	0.0	2.6	1.5	0.79	1.82	1.51	4.40	4.10	7.60	1.2
Dec-05	14,884	725	1.979%	100%	14.35	2.54	5.6	6.3	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	14884	1.70	32000	14,961	1.51	1.89	2.54	0.0	4.4	2.6	1.19	3.25	2.60	5.92	5.23	8.69	2.6
Jan-06	15,584	642	2.256%	60%	8.69	1.54	3.2	3.7	0	0	0.000%	60%	0.00	0.00	0.0	0	46	2.94%	60%	0.81	0.14	#DIV/0!	0	0	0.00%	60%	0.00	0.00	0.0	1.25	15584	1.72	32000	15,041	2.60	3.26	1.68	0.0	4.9	2.9	- 1.31	3.63	2.86	6.24	5.46	8.90	2.8
Feb-06	15,104	642	2.256%	75%	10.86	1.92	4.2	4.8	0	0	0.000%	75%	0.00	0.00	0.0	0	46	2.94%	75%	1.01	0.18	#DIV/0!	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15104	1.71	32000	15,114	2.86	3.58	2.10	0.0	5.7	3.3	1.53	4.15	3.32	6.78	5.84	9.24	3.0
Mar-06	15,618	642	2.256%	70%	10.14	1.80	3.8	3.1	0	0	0.000%	70%	0.00	0.00	0.0	0	46	2.94%	70%	0.94	0.17	#DIV/0!	0	0	0.00%	70%	0.00	0.00	0.0	1.25	15618	1.73	32000	19,356	3.32	4.16	1.96	0.0	6.1	3.5	2.09	4.03	3.55	7.02	6.01	9.39	3.3
Apr-06	16,453	642	2.256%	175%	25.34	4.49	9.0	9.6	0	0	0.000%	175%	0.00	0.00	0.0	0	46	2.94%	175%	2.35	0.42	#DIV/0!	0	0	0.00%	175%	0.00	0.00	0.0	1.25	16453	1.75	32000	17,439	3.55	4.43	4.91	1.0	8.3	4.8	2.53	5.81	4.76	8.26	6.86	10.10	4.6
May-06	19,475	642	2.256%	170%	24.61	4.36	7.4	5.3	0	0	0.000%	170%	0.00	0.00	0.0	0	46	2.94%	170%	2.28	0.40	#DIV/0!	0	0	0.00%	170%	0.00	0.00	0.0	1.25	19475	1.84	32000	20,203	4.76	5.96	4.77	2.0	8.7	4.7	2.91	5.81	4.73	8.23	6.84	10.08	3.7
Jun-06	18,310	642	2.256%	150%	21.72	3.85	6.9	3.4	0	0	0.000%	150%	0.00	0.00	0.0	22	46	2.94%	150%	2.01	0.36	531.3	0	0	0.00%	150%	0.00	0.00	0.0	1.25	18332	1.81	32000	27,717	4.73	5.92	4.21	3.0	7.1	3.9	3.32	3.80	3.94	7.44	6.30	9.63	1.4
Jul-06	17,677	642	2.256%	40%	5.79	1.03	1.9	4.4	0	0	0.000%	40%	0.00	0.00	0.0	40	46	2.94%	40%	0.54	0.10	77.3	0	0	0.00%	40%	0.00	0.00	0.0	1.25	17717	1.79	32000	22,154	3.94	4.93	1.12	3.0	3.0	1.7	1.15	1.90	1.70	4.69	4.32	7.83	0.2
Aug-06	18,560	642	2.256%	60%	8.69	1.54	2.7	7.3	0	0	0.000%	60%	0.00	0.00	0.0	38	46	2.94%	60%	0.81	0.14	122.6	0	0	0.00%	60%	0.00	0.00	0.0	1.25	18599	1.82	32000	18,801	1.70	2.13	1.68	3.0	0.8	0.4	0.26	0.56	0.45	2.25	2.37	5.62	0.5
Sep-06	19,176	642	2.256%	150%	21.72	3.85	6.6	5.4	0	0	0.000%	150%	0.00	0.00	0.0	154	46	2.94%	150%	2.01	0.36	76.1	0	0	0.00%	150%	0.00	0.00	0.0	1.25	19330	1.84	32000	25,746	0.45	0.56	4.21	3.0	1.8	1.0	0.75	1.01	0.96	3.42	3.34	6.79	1.0
Oct-06	18,487	642	2.256%	75%	10.86	1.92	3.4	3.7	0	0	0.000%	75%	0.00	0.00	0.0	430	46	2.94%	75%	1.01	0.18	13.6	0	0	0.00%	75%	0.00	0.00	0.0	1.25	18916	1.83	32000	26,010	0.96	1.20	2.10	2.0	1.3	0.7	0.56	0.74	0.71	2.91	2.92	6.31	1.1
Nov-06	19,635	642	2.256%	75%	10.86	1.92	3.2	2.4	0	0	0.000%	75%	0.00	0.00	0.0	687	46	2.94%	75%	1.01	0.18	8.5	0	0	0.00%	75%	0.00	0.00	0.0	1.25	20322	1.87	32000	23,981	0.71	0.89	2.10	0.0	3.0	1.6	1.17	1.83	1.60	4.54	4.20	7.71	1.5
Dec-06	17,652	642	2.256%	100%	14.48	2.57	4.8	4.5	0	0	0.000%	100%	0.00	0.00	0.0	929	46	2.94%	100%	1.34	0.24	8.4	0	0	0.00%	100%	0.00	0.00	0.0	1.25	18581	1.82	32000	19,976	1.60	2.00	2.80	0.0	4.8	2.6	1.61	3.20	2.65	5.98	5.27	8.73	2.1
Jan-07	17.200	408	2.794%	60%	6.84	1.21	2.3		500	400	0.924%	60%	2.22	0.39	25.8	8,200	33	2.94%	60%	0.57	0.10	0.4	0	0	0.00%	60%	0.00	0.00	0.0	1.25	25900	2.04	32000	25,900	2.65	3.31	1.71	0.0	5.0	2.5	1.94	3.08	2.46	5.75	5.10	8.58	
Feb-07	17.200	408	2.794%	75%	8.56	1.52	2.9		500	400	0.924%	75%	2.77	0.49	32.3	8,200	33	2.94%	75%	0.72	0.13	0.5	0	0	0.00%	75%	0.00	0.00	0.0	1.25	25900	2.04	32000	25,900	2.46	3.08	2.13	0.0	5.2	2.6	2.02	3.20	2.56	5.87	5.19	8.66	
Mar-07	17.200	408	2.794%	70%	7.99	1.42	2.7		500	400	0.924%	70%	2.59	0.46	30.1	8,200	33	2.94%	70%	0.67	0.12	0.5	0	0	0.00%	70%	0.00	0.00	0.0	1.25	25900	2.04	32000	25,900	2.56	3.20	1.99	0.0	5.2	2.5	2.01	3.18	2.55	5.85	5.18	8.65	
Apr-07	17.200	408	2.794%	175%	19.96	3.54	6.8		500	400	0.924%	175%	6.47	1.15	75.3	8,200	33	2.94%	175%	1.67	0.30	1.2	0	0	0.00%	175%	0.00	0.00	0.0	1.25	25900	2.04	32000	25,900	2.55	3.18	4.98	1.0	7.2	3.5	2.77	4.39	3.52	6.99	5.99	9.36	
May-07	17.200	408	2.794%	170%	19.39	3.44	6.6		500	400	0.924%	170%	6.28	1.11	73.1	8,200	33	2.94%	170%	1.62	0.29	1.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	25900	2.04	45000	25,900	3.52	4.39	4.84	2.0	7.2	3.5	2.80	4.44	3.55	7.02	6.01	9.39	

WLWB Ammonia Model - A418 to PKC Case

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Jun-07	17,200	408	2.794%	150%	17.11	3.03	5.8		500	400	0.924%	150%	5.54	0.98	64.5	8,200	33	2.94%	150%	1.43	0.25	1.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	25900	2.04	45000	25,900	3.55	4.44	4.27	3.0	5.7	2.8	2.21	3.50	2.80	6.17	5.40	8.85	
Jul-07	17,200	408	2.794%	40%	4.56	0.81	1.5		0	400	0.000%	40%	0.00	0.00	0.0	8,200	33	2.94%	40%	0.38	0.07	0.3	0	0	0.00%	40%	0.00	0.00	0.0	1.25	25400	2.02	45000	25,400	2.80	3.50	0.88	3.0	1.4	0.7	0.53	0.85	0.68	2.83	2.86	6.24	
Aug-07	17,200	408	2.794%	60%	6.84	1.21	2.3		0	400	0.000%	60%	0.00	0.00	0.0	8,200	33	2.94%	60%	0.57	0.10	0.4	0	0	0.00%	60%	0.00	0.00	0.0	1.25	25400	2.02	45000	25,400	0.68	0.85	1.31	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-07	17,200	408	2.794%	150%	17.11	3.03	5.8		0	400	0.000%	150%	0.00	0.00	0.0	8,200	33	2.94%	150%	1.43	0.25	1.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	25400	2.02	45000	25,400	0.00	0.00	3.29	3.0	0.3	0.1	0.11	0.18	0.14	1.19	1.41	4.23	
Oct-07	17,200	408	2.794%	75%	8.56	1.52	2.9		0	400	0.000%	75%	0.00	0.00	0.0	8,200	33	2.94%	75%	0.72	0.13	0.5	0	0	0.00%	75%	0.00	0.00	0.0	1.25	25400	2.02	45000	25,400	0.14	0.18	1.64	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-07	17,200	408	2.794%	75%	8.56	1.52	2.9		0	400	0.000%	75%	0.00	0.00	0.0	8,200	33	2.94%	75%	0.72	0.13	0.5	0	0	0.00%	75%	0.00	0.00	0.0	1.25	25400	2.02	45000	25,400	0.00	0.00	1.64	0.0	1.6	0.8	0.63	1.02	0.81	3.12	3.10	6.52	
Dec-07	17,200	408	2.794%	100%	11.41	2.02	3.9		0	400	0.000%	100%	0.00	0.00	0.0	8,200	33	2.94%	100%	0.96	0.17	0.7	0	0	0.00%	100%	0.00	0.00	0.0	1.25	25400	2.02	45000	25,400	0.81	1.02	2.19	0.0	3.2	1.6	1.22	1.98	1.59	4.51	4.18	7.69	
Jan-08	8,950	90	2.794%	60%	1.51	0.27	1.0		0	808	0.000%	60%	0.00	0.00	0.0	24,600	28	2.94%	60%	0.50	0.09	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	33550	2.27	45000	33,550	1.59	1.98	0.36	0.0	2.3	1.0	1.05	1.29	1.03	3.56	3.44	6.91	
Feb-08	8,950	90	2.794%	75%	1.89	0.33	1.2		0	808	0.000%	75%	0.00	0.00	0.0	24,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	33550	2.27	45000	33,550	1.03	1.29	0.44	0.0	1.7	0.8	0.78	0.95	0.76	3.02	3.01	6.42	
Mar-08	8,950	90	2.794%	70%	1.76	0.31	1.1		0	808	0.000%	70%	0.00	0.00	0.0	24,600	28	2.94%	70%	0.58	0.10	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	33550	2.27	45000	33,550	0.76	0.95	0.42	0.0	1.4	0.6	0.62	0.75	0.60	2.65	2.71	6.05	
Apr-08	8,950	90	2.794%	175%	4.40	0.78	2.9		0	808	0.000%	175%	0.00	0.00	0.0	24,600	28	2.94%	175%	1.46	0.26	0.3	0	0	0.00%	175%	0.00	0.00	0.0	1.25	33550	2.27	45000	33,550	0.60	0.75	1.04	1.0	0.8	0.3	0.36	0.44	0.35	1.96	2.12	5.29	
May-08	8,950	90	2.794%	170%	4.27	0.76	2.8		0	808	0.000%	170%	0.00	0.00	0.0	24,600	28	2.94%	170%	1.42	0.25	0.3	0	0	0.00%	170%	0.00	0.00	0.0	1.25	33550	2.27	45000	33,550	0.35	0.44	1.01	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-08	8,950	90	2.794%	150%	3.77	0.67	2.5		0	808	0.000%	150%	0.00	0.00	0.0	24,600	28	2.94%	150%	1.25	0.22	0.3	0	0	0.00%	150%	0.00	0.00	0.0	1.25	33550	2.27	45000	33,550	0.00	0.00	0.89	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-08	8,950	90	2.794%	40%	1.01	0.18	0.7		0	808	0.000%	40%	0.00	0.00	0.0	24,600	28	2.94%	40%	0.33	0.06	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	33550	2.27	45000	33,550	0.00	0.00	0.24	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-08	8,950	90	2.794%	60%	1.51	0.27	1.0		0	808	0.000%	60%	0.00	0.00	0.0	24,600	28	2.94%	60%	0.50	0.09	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	33550	2.27	45000	33,550	0.00	0.00	0.36	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-08	8,950	90	2.794%	150%	3.77	0.67	2.5		0	808	0.000%	150%	0.00	0.00	0.0	24,600	28	2.94%	150%	1.25	0.22	0.3	0	0	0.00%	150%	0.00	0.00	0.0	1.25	33550	2.27	45000	33,550	0.00	0.00	0.89	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-08	8,950	90	2.794%	75%	1.89	0.33	1.2		0	808	0.000%	75%	0.00	0.00	0.0	24,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	33550	2.27	45000	33,550	0.00	0.00	0.44	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-08	8,950	90	2.794%	75%	1.89	0.33	1.2		0	808	0.000%	75%	0.00	0.00	0.0	24,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	33550	2.27	45000	33,550	0.00	0.00	0.44	0.0	0.4	0.2	0.20	0.24	0.20	1.43	1.63	4.58	
Dec-08	8,950	90	2.794%	100%	2.51	0.45	1.6		0	808	0.000%	100%	0.00	0.00	0.0	24,600	28	2.94%	100%	0.83	0.15	0.2	0	0	0.00%	100%	0.00	0.00	0.0	1.25	33550	2.27	45000	33,550	0.20	0.24	0.59	0.0	0.8	0.4	0.38	0.46	0.37	2.02	2.17	5.36	
Jan-09	700	0	0.000%	60%	0.00	0.00	0.0		0	600	0.000%	60%	0.00	0.00	0.0	40,900	18	2.94%	60%	0.31	0.05	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	41600	2.52	60000	41,600	0.37	0.46	0.05	0.0	0.5	0.2	0.26	0.26	0.21	1.46	1.67	4.64	
Feb-09	700	0	0.000%	75%	0.00	0.00	0.0		0	600	0.000%	75%	0.00	0.00	0.0	40,900	18	2.94%	75%	0.39	0.07	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	41600	2.52	60000	41,600	0.21	0.26	0.07	0.0	0.3	0.1	0.16	0.16	0.13	1.14	1.35	4.13	
Mar-09	700	0	0.000%	70%	0.00	0.00	0.0		0	600	0.000%	70%	0.00	0.00	0.0	40,900	18	2.94%	70%	0.36	0.06	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	41600	2.52	60000	41,600	0.13	0.16	0.06	0.0	0.2	0.1	0.11	0.11	0.09	0.93	1.15	3.78	
Apr-09	700	0	0.000%	175%	0.00	0.00	0.0		0	600	0.000%	175%	0.00	0.00	0.0	40,900	18	2.94%	175%	0.90	0.16	0.1	0	0	0.00%	175%	0.00	0.00	0.0	1.25	41600	2.52	60000	41,600	0.09	0.11	0.16	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-09	700	0	0.000%	170%	0.00	0.00	0.0		0	600	0.000%	170%	0.00	0.00	0.0	40,900	18	2.94%	170%	0.87	0.16	0.1	0	0	0.00%	170%	0.00	0.00	0.0	1.25	41600	2.52	60000	41,600	0.00	0.00	0.16	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-09	700	0	0.000%	150%	0.00	0.00	0.0		0	600	0.000%	150%	0.00	0.00	0.0	40,900	18	2.94%	150%	0.77	0.14	0.1	0	0	0.00%	150%	0.00	0.00	0.0	1.25	41600	2.52	60000	41,600	0.00	0.00	0.14	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-09	700	0	0.000%	40%	0.00	0.00	0.0		0	600	0.000%	40%	0.00	0.00	0.0	40,900	18	2.94%	40%	0.21	0.04	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	41600	2.52	60000	41,600	0.00	0.00	0.04	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-09	700	0	0.000%	60%	0.00	0.00	0.0		0	600	0.000%	60%	0.00	0.00	0.0	40,900	18	2.94%	60%	0.31	0.05	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	41600	2.52	60000	41,600	0.00	0.00	0.05	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-09	700	0	0.000%	150%	0.00	0.00	0.0		0	600	0.000%	150%	0.00	0.00	0.0	40,900	18	2.94%	150%	0.77	0.14	0.1	0	0	0.00%	150%	0.00	0.00	0.0	1.25	41600	2.52	60000	41,600	0.00	0.00	0.14	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-09	700	0	0.000%	75%	0.00	0.00	0.0		0	600	0.000%	75%	0.00	0.00	0.0	40,900	18	2.94%	75%	0.39	0.07	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	41600	2.52	60000	41,600	0.00	0.00	0.07	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-09	700	0	0.000%	75%	0.00	0.00	0.0		0	600	0.000%	75%	0.00	0.00	0.0	40,900	18	2.94%	75%	0.39	0.07	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	41600	2.52	60000	41,600	0.00	0.00	0.07	0.0	0.1	0.0	0.03	0.03	0.03	0.48	0.67	2.61	
Dec-09	700	0	0.000%	100%	0.00	0.00	0.0		0	600	0.000%	100%	0.00	0.00	0.0	40,900	18	2.94%	100%	0.51	0.09	0.1	0	0	0.00%	100%	0.00	0.00	0.0	1.25	41600	2.52	60000	41,600	0.03	0.03	0.09	0.0	0.1	0.0	0.06	0.06	0.05	0.67	0.88	3.26	
Jan-10	700	0	0.000%	60%	0.00	0.00	0.0		0	183	0.000%	60%	0.00	0.00	0.0	39,200	11	2.94%	60%	0.19	0.03	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	39900	2.46	60000	39,900	0.05	0.06	0.03	0.0	0.1	0.0	0.05	0.05	0.04	0.59	0.79	3.08	
Feb-10	700	0	0.000%	75%	0.00	0.00	0.0		0	183	0.000%	75%	0.00	0.00	0.0	39,200	11	2.94%	75%	0.24	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39900	2.46	60000	39,900	0.04	0.05	0.04	0.0	0.1	0.0	0.05	0.05	0.04	0.57	0.77	3.04	
Mar-10	700	0	0.000%	70%	0.00	0.00	0.0		0	183	0.000%	70%	0.00	0.00	0.0	39,200	11	2.94%	70%	0.22	0.04	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	39900	2.46	60000	39,900	0.04	0.05	0.04	0.0	0.1	0.0	0.04	0.04	0.04	0.55	0.75	2.99	
Apr-10	700	0	0.000%	175%	0.00	0.00	0.0		0	183	0.000%	175%	0.00	0.00	0.0	39,200	11	2.94%	175%	0.56	0.10	0.1	0	0	0.00%	175%	0.00	0.00	0.0	1.25	39900	2.46	60000	39,900	0.04	0.04	0.10	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-10	700	0	0.000%	170%	0.00	0.00	0.0		0	183	0.000%	170%	0.00	0.00	0.0	39,200	11	2.94%	170%	0.55	0.10	0.1	0	0	0.00%	170%	0.00	0.00	0.0	1.25	39900	2.46	60000	39,900	0.00	0.00	0.10	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-10	700	0	0.000%	150%	0.00	0.00	0.0		0	183	0.000%	150%	0.00	0.00	0.0	39,200	11	2.94%	150%	0.48	0.09	0.1	0	0	0.00%	150%	0.00	0.00	0.0	1.25	39900	2.46	60000	39,900	0.00	0.00	0.09	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-10	700	0	0.000%	40%	0.00	0.00	0.0		0	183	0.000%	40%	0.00	0.00	0.0	39,200	11	2.94%	40%	0.13	0.02	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	39900	2.46	60000	39,900	0.00	0.00	0.02	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-10	700	0	0.000%	60%	0.00	0.00	0.0		0	183	0.000%	60%	0.00	0.00	0.0	39,200	11	2.94%	60%	0.19	0.03	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	39900	2.46	60000	39,900	0.00	0.00	0.03	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-10	700	0	0.000%	150%	0.00	0.00	0.0		0	183	0.000%	150%	0.00	0.00	0.0	39,200	11	2.94%	150%	0.48	0.09	0.1	0	0	0.00%	150%	0.00	0.00	0.0	1.25	39900	2.46	60000	39,900	0.00	0.00	0.09	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-10	700	0	0.000%	75%	0.00	0.00	0.0		0	183	0.000%	75%	0.00	0.00	0.0	39,200	11	2.94%	75%	0.24	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39900	2.46	60000	39,900	0.00	0.00	0.04	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-10	700	0	0.000%	75%	0.00	0.00	0.0		0	183	0.000%	75%	0.00	0.00	0.0	39,200	11	2.94%	75%	0.24	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39900	2.46	60000	39,900	0.00	0.00	0.04	0.0	0.0	0.0	0.02	0.02	0.02	0.38	0.55	2.51	
Dec-10	700	0	0.000%	100%	0.00	0.00	0.0		0	183	0.000%	100%	0.00	0.00	0.0	39,200	11	2.94%	100%	0.32	0.06	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	39900	2.46	60000	39,900	0.02	0.02	0.06	0.0	0.1	0.0	0.04	0.04	0.03	0.53	0.72	2.92	
Jan-11	700	0	0.000%	60%	0.00	0.00	0.0		0	23	0.000%	60%	0.00	0.00	0.0	37,400	33	2.94%	60%	0.57	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	38100	2.41	60000	38,100	0.03	0.04	0.10	0.0	0.1	0.1	0.07	0.07	0.06	0.74	0.95	3.40	
Feb-11	700	0	0.000%	75%	0.00	0.00	0.0		0	23	0.000%	75%	0.00	0.00	0.0	37,400	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	38100	2.41	60000	38,100	0.06	0.07	0.13	0.0	0.2	0.1	0.10	0.10	0.08	0.89	1.11	3.71	
Mar-11	700	0	0.000%	70%	0.00	0.00	0.0		0	23	0.000%	70%	0.00	0.00	0.0	37,400	33	2.94%	70%	0.67	0.12	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	38100	2.41	60000	38,100	0.08	0.10	0.12	0.0	0.2	0.1	0.11	0.12	0.09	0.94	1.16	3.80	
Apr-11	700	0	0.000%	175%	0.00	0.00	0.0		0	23	0.000%	175%	0.00	0.00	0.0	37,400	33	2.94%	175%	1.67	0.30	0.3	0	0	0.00%	175%	0.00	0.00	0.0	1.25	38100	2.41	60000	38,100	0.09	0.12	0.30	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-11	700	0	0.000%	170%	0.00	0.00	0.0		0	23	0.000%	170%	0.00	0.00	0.0	37,400	33	2.94%	170%	1.62	0.29	0.3	0	0	0.00%	170%	0.00	0.00	0.0	1.25	38100	2.41	60000	38,100	0.00	0.00	0.29	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-11	700	0	0.000%	150%	0.00	0.00	0.0		0	23	0.000%	150%	0.00	0.00	0.0	37,400	33	2.94%	150%	1.43	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	38100	2.41	60000	38,100	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-11	700	0	0.000%	40%	0.00	0.00	0.0		0	23	0.000%	40%	0.00	0.00	0.0	37,400	33	2.94%	40%	0.38	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	38100	2.41	60000	38,100	0.00	0.00	0.07	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-11	700	0	0.000%	60%	0.00	0.00	0.0		0	23	0.000%	60%	0.00	0.00	0.0	37,400	33	2.94%	60%	0.57	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	38100	2.41	60000	38,100	0.00	0.00	0.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-11	700	0	0.000%	150%	0.00	0.00	0.0		0	23	0.000%	150%	0.00	0.00	0.0	37,400	33	2.94%	150%	1.43	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	38100	2.41	60000	38,100	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-11	700	0	0.000%	75%	0.00	0.00	0.0		0	23	0.000%	75%	0.00	0.00	0.0	37,400	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	38100	2.41	60000	38,100	0.00	0.00	0.13	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - A418 to PKC Case

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Nov-11	700	0	0.000%	75%	0.00	0.00	0.0		0	23	0.000%	75%	0.00	0.00	0.0	37,400	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	38100	2.41	60000	38,100	0.00	0.00	0.13	0.0	0.1	0.1	0.06	0.07	0.05	0.69	0.90	3.31	
Dec-11	700	0	0.000%	100%	0.00	0.00	0.0		0	23	0.000%	100%	0.00	0.00	0.0	37,400	33	2.94%	100%	0.96	0.17	0.1	0	0	0.00%	100%	0.00	0.00	0.0	1.25	38100	2.41	60000	38,100	0.05	0.07	0.17	0.0	0.2	0.1	0.11	0.12	0.10	0.97	1.19	3.86	
Jan-12	700	0	0.000%	60%	0.00	0.00	0.0		0	1	0.000%	60%	0.00	0.00	0.0	37,350	30	2.94%	60%	0.53	0.09	0.1	2,100	190	0.92%	60%	1.76	0.31	4.9	1.25	40150	2.47	60000	40,150	0.10	0.12	0.40	0.0	0.5	0.2	0.26	0.27	0.21	1.50	1.70	4.68	
Feb-12	700	0	0.000%	75%	0.00	0.00	0.0		0	1	0.000%	75%	0.00	0.00	0.0	37,350	30	2.94%	75%	0.66	0.12	0.1	2,100	190	0.92%	75%	1.76	0.31	4.9	1.25	40150	2.47	60000	40,150	0.21	0.27	0.43	0.0	0.7	0.3	0.34	0.35	0.28	1.74	1.92	5.01	
Mar-12	700	0	0.000%	70%	0.00	0.00	0.0		0	1	0.000%	70%	0.00	0.00	0.0	37,350	30	2.94%	70%	0.62	0.11	0.1	2,100	190	0.92%	70%	1.76	0.31	4.9	1.25	40150	2.47	60000	40,150	0.28	0.35	0.42	0.0	0.8	0.3	0.38	0.39	0.31	1.85	2.01	5.14	
Apr-12	700	0	0.000%	175%	0.00	0.00	0.0		0	1	0.000%	175%	0.00	0.00	0.0	37,350	30	2.94%	175%	1.54	0.27	0.2	2,100	190	0.92%	175%	1.76	0.31	4.9	1.25	40150	2.47	60000	40,150	0.31	0.39	0.58	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-12	700	0	0.000%	170%	0.00	0.00	0.0		0	1	0.000%	170%	0.00	0.00	0.0	37,350	30	2.94%	170%	1.50	0.27	0.2	2,100	190	0.92%	170%	1.76	0.31	4.9	1.25	40150	2.47	60000	40,150	0.00	0.00	0.58	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-12	700	0	0.000%	150%	0.00	0.00	0.0		0	1	0.000%	150%	0.00	0.00	0.0	37,350	30	2.94%	150%	1.32	0.23	0.2	2,100	190	0.92%	150%	1.76	0.31	4.9	1.25	40150	2.47	60000	40,150	0.00	0.00	0.55	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-12	700	0	0.000%	40%	0.00	0.00	0.0		0	1	0.000%	40%	0.00	0.00	0.0	37,350	30	2.94%	40%	0.35	0.06	0.1	2,100	190	0.92%	40%	1.76	0.31	4.9	1.25	40150	2.47	60000	40,150	0.00	0.00	0.37	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-12	700	0	0.000%	60%	0.00	0.00	0.0		0	1	0.000%	60%	0.00	0.00	0.0	37,350	30	2.94%	60%	0.53	0.09	0.1	2,100	190	0.92%	60%	1.76	0.31	4.9	1.25	40150	2.47	60000	40,150	0.00	0.00	0.40	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-12	700	0	0.000%	150%	0.00	0.00	0.0		0	1	0.000%	150%	0.00	0.00	0.0	37,350	30	2.94%	150%	1.32	0.23	0.2	2,100	190	0.92%	150%	1.76	0.31	4.9	1.25	40150	2.47	60000	40,150	0.00	0.00	0.55	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-12	700	0	0.000%	75%	0.00	0.00	0.0		0	1	0.000%	75%	0.00	0.00	0.0	37,350	30	2.94%	75%	0.66	0.12	0.1	2,100	190	0.92%	75%	1.76	0.31	4.9	1.25	40150	2.47	60000	40,150	0.00	0.00	0.43	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-12	700	0	0.000%	75%	0.00	0.00	0.0		0	1	0.000%	75%	0.00	0.00	0.0	37,350	30	2.94%	75%	0.66	0.12	0.1	2,100	190	0.92%	75%	1.76	0.31	4.9	1.25	40150	2.47	60000	40,150	0.00	0.00	0.43	0.0	0.4	0.2	0.21	0.22	0.17	1.33	1.55	4.45	
Dec-12	700	0	0.000%	100%	0.00	0.00	0.0		0	1	0.000%	100%	0.00	0.00	0.0	37,350	30	2.94%	100%	0.88	0.16	0.1	2,100	190	0.92%	100%	1.76	0.31	4.9	1.25	40150	2.47	60000	40,150	0.17	0.22	0.47	0.0	0.7	0.3	0.34	0.35	0.28	1.73	1.91	4.99	
Jan-13	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	37,300	17	2.94%	60%	0.29	0.05	0.0	4,500	376	1.60%	60%	6.00	1.06	7.8	1.25	42500	2.54	60000	42,500	0.28	0.35	1.12	0.0	1.5	0.6	0.74	0.72	0.58	2.58	2.65	5.98	
Feb-13	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	37,300	17	2.94%	75%	0.37	0.07	0.1	4,500	376	1.60%	75%	6.00	1.06	7.8	1.25	42500	2.54	60000	42,500	0.58	0.72	1.13	0.0	1.8	0.7	0.94	0.91	0.73	2.94	2.95	6.34	
Mar-13	700	0	0.000%	70%	0.00	0.00	0.0		0	0	0.000%	70%	0.00	0.00	0.0	37,300	17	2.94%	70%	0.34	0.06	0.1	4,500	376	1.60%	70%	6.00	1.06	7.8	1.25	42500	2.54	60000	42,500	0.73	0.91	1.12	0.0	2.0	0.8	1.03	1.00	0.80	3.10	3.07	6.49	
Apr-13	700	0	0.000%	175%	0.00	0.00	0.0		0	0	0.000%	175%	0.00	0.00	0.0	37,300	17	2.94%	175%	0.86	0.15	0.1	4,500	376	1.60%	175%	6.00	1.06	7.8	1.25	42500	2.54	60000	42,500	0.80	1.00	1.22	1.0	1.2	0.5	0.62	0.60	0.48	2.33	2.44	5.72	
May-13	700	0	0.000%	170%	0.00	0.00	0.0		0	0	0.000%	170%	0.00	0.00	0.0	37,300	17	2.94%	170%	0.83	0.15	0.1	4,500	376	1.60%	170%	6.00	1.06	7.8	1.25	42500	2.54	60000	42,500	0.48	0.60	1.21	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-13	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	37,300	17	2.94%	150%	0.74	0.13	0.1	4,500	376	1.60%	150%	6.00	1.06	7.8	1.25	42500	2.54	60000	42,500	0.00	0.00	1.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-13	700	0	0.000%	40%	0.00	0.00	0.0		0	0	0.000%	40%	0.00	0.00	0.0	37,300	17	2.94%	40%	0.20	0.03	0.0	4,500	376	1.60%	40%	6.00	1.06	7.8	1.25	42500	2.54	60000	42,500	0.00	0.00	1.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-13	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	37,300	17	2.94%	60%	0.29	0.05	0.0	4,500	376	1.60%	60%	6.00	1.06	7.8	1.25	42500	2.54	60000	42,500	0.00	0.00	1.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-13	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	37,300	17	2.94%	150%	0.74	0.13	0.1	4,500	376	1.60%	150%	6.00	1.06	7.8	1.25	42500	2.54	60000	42,500	0.00	0.00	1.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-13	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	37,300	17	2.94%	75%	0.37	0.07	0.1	4,500	376	1.60%	75%	6.00	1.06	7.8	1.25	42500	2.54	60000	42,500	0.00	0.00	1.13	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-13	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	37,300	17	2.94%	75%	0.37	0.07	0.1	4,500	376	1.60%	75%	6.00	1.06	7.8	1.25	42500	2.54	60000	42,500	0.00	0.00	1.13	0.0	1.1	0.4	0.57	0.56	0.44	2.24	2.36	5.61	
Dec-13	700	0	0.000%	100%	0.00	0.00	0.0		0	0	0.000%	100%	0.00	0.00	0.0	37,300	17	2.94%	100%	0.49	0.09	0.1	4,500	376	1.60%	100%	6.00	1.06	7.8	1.25	42500	2.54	60000	42,500	0.44	0.56	1.15	0.0	1.7	0.7	0.87	0.84	0.67	2.81	2.84	6.22	
Jan-14	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	38,950	21	2.94%	60%	0.37	0.07	0.1	7,200	468	1.98%	60%	9.25	1.64	7.5	1.25	46850	2.68	60000	46,850	0.67	0.84	1.70	0.0	2.5	1.0	1.35	1.19	0.95	3.40	3.32	6.78	
Feb-14	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	38,950	21	2.94%	75%	0.46	0.08	0.1	7,200	468	1.98%	75%	9.25	1.64	7.5	1.25	46850	2.68	60000	46,850	0.95	1.19	1.72	0.0	2.9	1.1	1.55	1.36	1.09	3.67	3.53	7.01	
Mar-14	700	0	0.000%	70%	0.00	0.00	0.0		0	0	0.000%	70%	0.00	0.00	0.0	38,950	21	2.94%	70%	0.43	0.08	0.1	7,200	468	1.98%	70%	9.25	1.64	7.5	1.25	46850	2.68	60000	46,850	1.09	1.36	1.72	0.0	3.1	1.1	1.64	1.44	1.15	3.78	3.62	7.10	
Apr-14	700	0	0.000%	175%	0.00	0.00	0.0		0	0	0.000%	175%	0.00	0.00	0.0	38,950	21	2.94%	175%	1.07	0.19	0.2	7,200	468	1.98%	175%	9.25	1.64	7.5	1.25	46850	2.68	60000	46,850	1.15	1.44	1.83	1.0	2.3	0.8	1.21	1.06	0.85	3.20	3.16	6.59	
May-14	700	0	0.000%	170%	0.00	0.00	0.0		0	0	0.000%	170%	0.00	0.00	0.0	38,950	21	2.94%	170%	1.04	0.18	0.2	7,200	468	1.98%	170%	9.25	1.64	7.5	1.25	46850	2.68	60000	46,850	0.85	1.06	1.82	2.0	0.9	0.3	0.47	0.41	0.33	1.90	2.07	5.22	
Jun-14	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	38,950	21	2.94%	150%	0.92	0.16	0.1	7,200	468	1.98%	150%	9.25	1.64	7.5	1.25	46850	2.68	60000	46,850	0.33	0.41	1.80	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-14	700	0	0.000%	40%	0.00	0.00	0.0		0	0	0.000%	40%	0.00	0.00	0.0	38,950	21	2.94%	40%	0.25	0.04	0.0	7,200	468	1.98%	40%	9.25	1.64	7.5	1.25	46850	2.68	60000	46,850	0.00	0.00	1.68	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-14	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	38,950	21	2.94%	60%	0.37	0.07	0.1	7,200	468	1.98%	60%	9.25	1.64	7.5	1.25	46850	2.68	60000	46,850	0.00	0.00	1.70	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-14	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	38,950	21	2.94%	150%	0.92	0.16	0.1	7,200	468	1.98%	150%	9.25	1.64	7.5	1.25	46850	2.68	60000	46,850	0.00	0.00	1.80	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-14	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	38,950	21	2.94%	75%	0.46	0.08	0.1	7,200	468	1.98%	75%	9.25	1.64	7.5	1.25	46850	2.68	60000	46,850	0.00	0.00	1.72	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-14	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	38,950	21	2.94%	75%	0.46	0.08	0.1	7,200	468	1.98%	75%	9.25	1.64	7.5	1.25	46850	2.68	60000	46,850	0.00	0.00	1.72	0.0	1.7	0.6	-0.92	0.80	0.64	2.75	2.79	6.15	
Dec-14	700	0	0.000%	100%	0.00	0.00	0.0		0	0	0.000%	100%	0.00	0.00	0.0	38,950	21	2.94%	100%	0.61	0.11	0.1	7,200	468	1.98%	100%	9.25	1.64	7.5	1.25	46850	2.68	60000	46,850	0.64	0.80	1.75	0.0	2.6	1.0	1.36	1.19	0.95	3.41	3.33	6.78	
Jan-15	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	40,600	28	2.94%	60%	0.50	0.09	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	41300	2.51	60000	41,300	0.95	1.19	0.09	0.0	1.3	0.5	0.64	0.64	0.51	2.42	2.51	5.81	
Feb-15	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	40,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	41300	2.51	60000	41,300	0.51	0.64	0.11	0.0	0.7	0.3	0.38	0.37	0.30	1.80	1.98	5.09	
Mar-15	700	0	0.000%	70%	0.00	0.00	0.0		0	0	0.000%	70%	0.00	0.00	0.0	40,600	28	2.94%	70%	0.58	0.10	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	41300	2.51	60000	41,300	0.30	0.37	0.10	0.0	0.5	0.2	0.24	0.24	0.19	1.41	1.61	4.55	
Apr-15	700	0	0.000%	175%	0.00	0.00	0.0		0	0	0.000%	175%	0.00	0.00	0.0	40,600	28	2.94%	175%	1.46	0.26	0.2	0	0	0.00%	175%	0.00	0.00	0.0	1.25	41300	2.51	60000	41,300	0.19	0.24	0.26	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-15	700	0	0.000%	170%	0.00	0.00	0.0		0	0	0.000%	170%	0.00	0.00	0.0	40,600	28	2.94%	170%	1.42	0.25	0.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	41300	2.51	60000	41,300	0.00	0.00	0.25	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-15	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	40,600	28	2.94%	150%	1.25	0.22	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	41300	2.51	60000	41,300	0.00	0.00	0.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-15	700	0	0.000%	40%	0.00	0.00	0.0		0	0	0.000%	40%	0.00	0.00	0.0	40,600	28	2.94%	40%	0.33	0.06	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	41300	2.51	60000	41,300	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-15	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	40,600	28	2.94%	60%	0.50	0.09	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	41300	2.51	60000	41,300	0.00	0.00	0.09	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-15	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	40,600	28	2.94%	150%	1.25	0.22	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	41300	2.51	60000	41,300	0.00	0.00	0.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-15	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	40,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	41300	2.51	60000	41,300	0.00	0.00	0.11	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-15	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	40,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	41300	2.51	60000	41,300	0.00	0.00	0.11	0.0	0.1	0.0	0.06	0.06	0.04	0.63	0.84	3.17	
Dec-15	700	0	0.000%	100%	0.00	0.00	0.0		0	0	0.000%	100%	0.00	0.00	0.0	40,600	28	2.94%	100%	0.83	0.15	0.1	0	0	0.00%	100%	0.00	0.00	0.0	1.25	41300	2.51	60000	41,300	0.04	0.06	0.15	0.0	0.2	0.1	0.10	0.10	0.08	0.88	1.10	3.68	
Jan-16	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	40,000	31	2.94%	60%	0.54	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.08	0.10	0.10	0.0	0.2	0.1	0.10	0.10	0.08	0.87	1.09	3.67	
Feb-16	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	40,000	31	2.94%	75%	0.68	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.08	0.10	0.12	0.0	0.2	0.1	0.11	0.11	0.09	0.92	1.14	3.76	
Mar-16	700	0	0.000%	70%	0.00	0.00	0.0		0	0	0.000%	70%	0.00	0.00	0.0	40,000	31	2.94%	70%	0.63	0.11	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.09	0.11	0.11	0.0	0.2	0.1	0.11	0.11	0.09	0.93	1.15	3.78	

WLWB Ammonia Model - A418 to PKC Case

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Apr-16	700	0	0.000%	175%	0.00	0.00	0.0		0	0	0.000%	175%	0.00	0.00	0.0	40,000	31	2.94%	175%	1.59	0.28	0.2	0	0	0.00%	175%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.09	0.11	0.28	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-16	700	0	0.000%	170%	0.00	0.00	0.0		0	0	0.000%	170%	0.00	0.00	0.0	40,000	31	2.94%	170%	1.54	0.27	0.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.27	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-16	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	40,000	31	2.94%	150%	1.36	0.24	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.24	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-16	700	0	0.000%	40%	0.00	0.00	0.0		0	0	0.000%	40%	0.00	0.00	0.0	40,000	31	2.94%	40%	0.36	0.06	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-16	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	40,000	31	2.94%	60%	0.54	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-16	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	40,000	31	2.94%	150%	1.36	0.24	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.24	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-16	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	40,000	31	2.94%	75%	0.68	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.12	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-16	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	40,000	31	2.94%	75%	0.68	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.12	0.0	0.1	0.0	0.06	0.06	0.05	0.66	0.87	3.24	
Dec-16	700	0	0.000%	100%	0.00	0.00	0.0		0	0	0.000%	100%	0.00	0.00	0.0	40,000	31	2.94%	100%	0.91	0.16	0.1	0	0	0.00%	100%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.05	0.06	0.16	0.0	0.2	0.1	0.11	0.11	0.09	0.92	1.14	3.77	
Jan-17	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	39,500	38	2.94%	60%	0.66	0.12	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.09	0.11	0.12	0.0	0.2	0.1	0.11	0.12	0.09	0.94	1.16	3.80	
Feb-17	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	39,500	38	2.94%	75%	0.83	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.09	0.12	0.15	0.0	0.3	0.1	0.13	0.13	0.11	1.02	1.24	3.94	
Mar-17	700	0	0.000%	70%	0.00	0.00	0.0		0	0	0.000%	70%	0.00	0.00	0.0	39,500	38	2.94%	70%	0.77	0.14	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.11	0.13	0.14	0.0	0.3	0.1	0.13	0.14	0.11	1.03	1.25	3.96	
Apr-17	700	0	0.000%	175%	0.00	0.00	0.0		0	0	0.000%	175%	0.00	0.00	0.0	39,500	38	2.94%	175%	1.93	0.34	0.3	0	0	0.00%	175%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.11	0.14	0.34	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-17	700	0	0.000%	170%	0.00	0.00	0.0		0	0	0.000%	170%	0.00	0.00	0.0	39,500	38	2.94%	170%	1.87	0.33	0.3	0	0	0.00%	170%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.33	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-17	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	39,500	38	2.94%	150%	1.65	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-17	700	0	0.000%	40%	0.00	0.00	0.0		0	0	0.000%	40%	0.00	0.00	0.0	39,500	38	2.94%	40%	0.44	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-17	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	39,500	38	2.94%	60%	0.66	0.12	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-17	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	39,500	38	2.94%	150%	1.65	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-17	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	39,500	38	2.94%	75%	0.83	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.15	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-17	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	39,500	38	2.94%	75%	0.83	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.15	0.0	0.1	0.1	0.07	0.07	0.06	0.74	0.95	3.41	
Dec-17	700	0	0.000%	100%	0.00	0.00	0.0		0	0	0.000%	100%	0.00	0.00	0.0	39,500	38	2.94%	100%	1.10	0.20	0.2	0	0	0.00%	100%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.06	0.07	0.20	0.0	0.3	0.1	0.13	0.14	0.11	1.03	1.25	3.96	
Jan-18	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	39,000	37	2.94%	60%	0.65	0.11	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.11	0.14	0.11	0.0	0.3	0.1	0.12	0.13	0.10	1.00	1.22	3.90	
Feb-18	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	39,000	37	2.94%	75%	0.81	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.10	0.13	0.14	0.0	0.3	0.1	0.13	0.14	0.11	1.04	1.26	3.98	
Mar-18	700	0	0.000%	70%	0.00	0.00	0.0		0	0	0.000%	70%	0.00	0.00	0.0	39,000	37	2.94%	70%	0.75	0.13	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.11	0.14	0.13	0.0	0.3	0.1	0.13	0.14	0.11	1.04	1.26	3.98	
Apr-18	700	0	0.000%	175%	0.00	0.00	0.0		0	0	0.000%	175%	0.00	0.00	0.0	39,000	37	2.94%	175%	1.89	0.33	0.3	0	0	0.00%	175%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.11	0.14	0.33	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-18	700	0	0.000%	170%	0.00	0.00	0.0		0	0	0.000%	170%	0.00	0.00	0.0	39,000	37	2.94%	170%	1.83	0.32	0.3	0	0	0.00%	170%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.32	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-18	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	39,000	37	2.94%	150%	1.62	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-18	700	0	0.000%	40%	0.00	0.00	0.0		0	0	0.000%	40%	0.00	0.00	0.0	39,000	37	2.94%	40%	0.43	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-18	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	39,000	37	2.94%	60%	0.65	0.11	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.11	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-18	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	39,000	37	2.94%	150%	1.62	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-18	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	39,000	37	2.94%	75%	0.81	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.14	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-18	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	39,000	37	2.94%	75%	0.81	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.14	0.0	0.1	0.1	0.07	0.07	0.06	0.73	0.95	3.40	
Dec-18	700	0	0.000%	100%	0.00	0.00	0.0		0	0	0.000%	100%	0.00	0.00	0.0	39,000	37	2.94%	100%	1.08	0.19	0.2	0	0	0.00%	100%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.06	0.07	0.19	0.0	0.3	0.1	0.13	0.13	0.11	1.03	1.25	3.95	
Jan-19	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	38,500	33	2.94%	60%	0.57	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	39200	2.44	60000	39,200	0.11	0.13	0.10	0.0	0.2	0.1	0.12	0.12	0.10	0.97	1.19	3.85	
Feb-19	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	38,500	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39200	2.44	60000	39,200	0.10	0.12	0.13	0.0	0.2	0.1	0.12	0.13	0.10	0.99	1.21	3.89	
Mar-19	700	0	0.000%	70%	0.00	0.00	0.0		0	0	0.000%	70%	0.00	0.00	0.0	38,500	33	2.94%	70%	0.67	0.12	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	39200	2.44	60000	39,200	0.10	0.13	0.12	0.0	0.2	0.1	0.12	0.13	0.10	0.99	1.21	3.88	
Apr-19	700	0	0.000%	175%	0.00	0.00	0.0		0	0	0.000%	175%	0.00	0.00	0.0	38,500	33	2.94%	175%	1.67	0.30	0.3	0	0	0.00%	175%	0.00	0.00	0.0	1.25	39200	2.44	60000	39,200	0.10	0.13	0.30	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-19	700	0	0.000%	170%	0.00	0.00	0.0		0	0	0.000%	170%	0.00	0.00	0.0	38,500	33	2.94%	170%	1.62	0.29	0.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	39200	2.44	60000	39,200	0.00	0.00	0.29	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-19	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	38,500	33	2.94%	150%	1.43	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	39200	2.44	60000	39,200	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-19	700	0	0.000%	40%	0.00	0.00	0.0		0	0	0.000%	40%	0.00	0.00	0.0	38,500	33	2.94%	40%	0.38	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	39200	2.44	60000	39,200	0.00	0.00	0.07	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-19	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	38,500	33	2.94%	60%	0.57	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	39200	2.44	60000	39,200	0.00	0.00	0.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-19	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	38,500	33	2.94%	150%	1.43	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	39200	2.44	60000	39,200	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-19	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	38,500	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39200	2.44	60000	39,200	0.00	0.00	0.13	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-19	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	38,500	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39200	2.44	60000	39,200	0.00	0.00	0.13	0.0	0.1	0.1	0.06	0.06	0.05	0.69	0.90	3.30	
Dec-19	700	0	0.000%	100%	0.00	0.00	0.0		0	0	0.000%	100%	0.00	0.00	0.0	38,500	33	2.94%	100%	0.96	0.17	0.1	0	0	0.00%	100%	0.00	0.00	0.0	1.25	39200	2.44	60000	39,200	0.05	0.06	0.17	0.0	0.2	0.1	0.11	0.12	0.10	0.96	1.18	3.84	
Jan-20	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	42,600	38	2.94%	60%	0.68	0.12	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	43300	2.57	60000	43,300	0.10	0.12	0.12	0.0	0.2	0.1	0.12	0.12	0.09	0.95	1.17	3.82	
Feb-20	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	42,600	38	2.94%	75%	0.85	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	43300	2.57	60000	43,300	0.09	0.12	0.15	0.0	0.3	0.1	0.14	0.13	0.10	1.01	1.23	3.92	
Mar-20	700	0	0.000%	70%	0.00	0.00	0.0		0	0	0.000%	70%	0.00	0.00	0.0	42,600	38	2.94%	70%	0.79	0.14	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	43300	2.57	60000	43,300	0.10	0.13	0.14	0.0	0.3	0.1	0.14	0.13	0.11	1.01	1.23	3.93	
Apr-20	700	0	0.000%	175%	0.00	0.00	0.0		0	0	0.000%	175%	0.00	0.00	0.0	42,600	38	2.94%	175%	1.97	0.35	0.3	0	0	0.00%	175%	0.00	0.00	0.0	1.25	43300	2.57	60000	43,300	0.11	0.13	0.35	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-20	700	0	0.000%	170%	0.00	0.00	0.0		0	0	0.000%	170%	0.00	0.00	0.0	42,600	38	2.94%	170%	1.92	0.34	0.3	0	0	0.00%	170%	0.00	0.00	0.0	1.25	43300	2.57	60000	43,300	0.00	0.00	0.34	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-20	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	42,600	38	2.94%	150%	1.69	0.30	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	43300	2.57	60000	43,300	0.00	0.00	0.30	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-20	700	0	0.000%	40%	0.00	0.00	0.0		0	0	0.000%	40%	0.00	0.00	0.0	42,600	38	2.94%	40%	0.45	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	43300	2.57	60000	43,300	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-20	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	42,600	38	2.94%	60%	0.68	0.12	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	43300	2.57	60000	43,300	0.00	0.00	0.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - A418 to PKC Case

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Sep-20	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	42,600	38	2.94%	150%	1.69	0.30	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	43300	2.57	60000	43,300	0.00	0.00	0.30	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-20	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	42,600	38	2.94%	75%	0.85	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	43300	2.57	60000	43,300	0.00	0.00	0.15	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-20	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	42,600	38	2.94%	75%	0.85	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	43300	2.57	60000	43,300	0.00	0.00	0.15	0.0	0.1	0.1	0.08	0.07	0.06	0.73	0.95	3.40	
Dec-20	700	0	0.000%	100%	0.00	0.00	0.0		0	0	0.000%	100%	0.00	0.00	0.0	42,600	38	2.94%	100%	1.13	0.20	0.2	0	0	0.00%	100%	0.00	0.00	0.0	1.25	43300	2.57	60000	43,300	0.06	0.07	0.20	0.0	0.3	0.1	0.14	0.13	0.11	1.02	1.24	3.94	
Jan-21	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	46,800	40	2.94%	60%	0.71	0.13	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	47500	2.69	60000	47,500	0.11	0.13	0.13	0.0	0.3	0.1	0.14	0.12	0.10	0.96	1.18	3.84	
Feb-21	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	46,800	40	2.94%	75%	0.88	0.16	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	47500	2.69	60000	47,500	0.10	0.12	0.16	0.0	0.3	0.1	0.15	0.13	0.10	1.00	1.22	3.90	
Mar-21	700	0	0.000%	70%	0.00	0.00	0.0		0	0	0.000%	70%	0.00	0.00	0.0	46,800	40	2.94%	70%	0.82	0.15	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	47500	2.69	60000	47,500	0.10	0.13	0.15	0.0	0.3	0.1	0.15	0.13	0.10	1.00	1.22	3.90	
Apr-21	700	0	0.000%	175%	0.00	0.00	0.0		0	0	0.000%	175%	0.00	0.00	0.0	46,800	40	2.94%	175%	2.06	0.36	0.3	0	0	0.00%	175%	0.00	0.00	0.0	1.25	47500	2.69	60000	47,500	0.10	0.13	0.36	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-21	700	0	0.000%	170%	0.00	0.00	0.0		0	0	0.000%	170%	0.00	0.00	0.0	46,800	40	2.94%	170%	2.00	0.35	0.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	47500	2.69	60000	47,500	0.00	0.00	0.35	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-21	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	46,800	40	2.94%	150%	1.76	0.31	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	47500	2.69	60000	47,500	0.00	0.00	0.31	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-21	700	0	0.000%	40%	0.00	0.00	0.0		0	0	0.000%	40%	0.00	0.00	0.0	46,800	40	2.94%	40%	0.47	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	47500	2.69	60000	47,500	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-21	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	46,800	40	2.94%	60%	0.71	0.13	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	47500	2.69	60000	47,500	0.00	0.00	0.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-21	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	46,800	40	2.94%	150%	1.76	0.31	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	47500	2.69	60000	47,500	0.00	0.00	0.31	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-21	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	46,800	40	2.94%	75%	0.88	0.16	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	47500	2.69	60000	47,500	0.00	0.00	0.16	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-21	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	46,800	40	2.94%	75%	0.88	0.16	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	47500	2.69	60000	47,500	0.00	0.00	0.16	0.0	0.2	0.1	0.08	0.07	0.06	0.73	0.94	3.39	
Dec-21	700	0	0.000%	100%	0.00	0.00	0.0		0	0	0.000%	100%	0.00	0.00	0.0	46,800	40	2.94%	100%	1.18	0.21	0.1	0	0	0.00%	100%	0.00	0.00	0.0	1.25	47500	2.69	60000	47,500	0.06	0.07	0.21	0.0	0.3	0.1	0.15	0.13	0.10	1.01	1.23	3.92	
Jan-22	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	42,200	32	2.94%	60%	0.56	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	42900	2.55	60000	42,900	0.10	0.13	0.10	0.0	0.2	0.1	0.12	0.11	0.09	0.93	1.15	3.78	
Feb-22	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	42,200	32	2.94%	75%	0.70	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	42900	2.55	60000	42,900	0.09	0.11	0.12	0.0	0.2	0.1	0.12	0.12	0.09	0.94	1.16	3.80	
Mar-22	700	0	0.000%	70%	0.00	0.00	0.0		0	0	0.000%	70%	0.00	0.00	0.0	42,200	32	2.94%	70%	0.65	0.12	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	42900	2.55	60000	42,900	0.09	0.12	0.12	0.0	0.2	0.1	0.12	0.11	0.09	0.93	1.15	3.78	
Apr-22	700	0	0.000%	175%	0.00	0.00	0.0		0	0	0.000%	175%	0.00	0.00	0.0	42,200	32	2.94%	175%	1.63	0.29	0.2	0	0	0.00%	175%	0.00	0.00	0.0	1.25	42900	2.55	60000	42,900	0.09	0.11	0.29	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-22	700	0	0.000%	170%	0.00	0.00	0.0		0	0	0.000%	170%	0.00	0.00	0.0	42,200	32	2.94%	170%	1.58	0.28	0.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	42900	2.55	60000	42,900	0.00	0.00	0.28	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-22	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	42,200	32	2.94%	150%	1.40	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	42900	2.55	60000	42,900	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-22	700	0	0.000%	40%	0.00	0.00	0.0		0	0	0.000%	40%	0.00	0.00	0.0	42,200	32	2.94%	40%	0.37	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	42900	2.55	60000	42,900	0.00	0.00	0.07	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-22	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	42,200	32	2.94%	60%	0.56	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	42900	2.55	60000	42,900	0.00	0.00	0.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-22	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	42,200	32	2.94%	150%	1.40	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	42900	2.55	60000	42,900	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-22	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	42,200	32	2.94%	75%	0.70	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	42900	2.55	60000	42,900	0.00	0.00	0.12	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-22	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	42,200	32	2.94%	75%	0.70	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	42900	2.55	60000	42,900	0.00	0.00	0.12	0.0	0.1	0.0	0.06	0.06	0.05	0.66	0.87	3.24	
Dec-22	700	0	0.000%	100%	0.00	0.00	0.0		0	0	0.000%	100%	0.00	0.00	0.0	42,200	32	2.94%	100%	0.93	0.16	0.1	0	0	0.00%	100%	0.00	0.00	0.0	1.25	42900	2.55	60000	42,900	0.05	0.06	0.16	0.0	0.2	0.1	0.12	0.11	0.09	0.92	1.14	3.76	
Jan-23	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	37,700	35	2.94%	60%	0.62	0.11	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	38400	2.42	60000	38,400	0.09	0.11	0.11	0.0	0.2	0.1	0.11	0.11	0.09	0.94	1.16	3.79	
Feb-23	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	37,700	35	2.94%	75%	0.77	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	38400	2.42	60000	38,400	0.09	0.11	0.14	0.0	0.3	0.1	0.12	0.13	0.10	1.01	1.23	3.91	
Mar-23	700	0	0.000%	70%	0.00	0.00	0.0		0	0	0.000%	70%	0.00	0.00	0.0	37,700	35	2.94%	70%	0.72	0.13	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	38400	2.42	60000	38,400	0.10	0.13	0.13	0.0	0.3	0.1	0.12	0.13	0.11	1.02	1.24	3.94	
Apr-23	700	0	0.000%	175%	0.00	0.00	0.0		0	0	0.000%	175%	0.00	0.00	0.0	37,700	35	2.94%	175%	1.80	0.32	0.3	0	0	0.00%	175%	0.00	0.00	0.0	1.25	38400	2.42	60000	38,400	0.11	0.13	0.32	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-23	700	0	0.000%	170%	0.00	0.00	0.0		0	0	0.000%	170%	0.00	0.00	0.0	37,700	35	2.94%	170%	1.75	0.31	0.3	0	0	0.00%	170%	0.00	0.00	0.0	1.25	38400	2.42	60000	38,400	0.00	0.00	0.31	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-23	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	37,700	35	2.94%	150%	1.54	0.27	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	38400	2.42	60000	38,400	0.00	0.00	0.27	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-23	700	0	0.000%	40%	0.00	0.00	0.0		0	0	0.000%	40%	0.00	0.00	0.0	37,700	35	2.94%	40%	0.41	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	38400	2.42	60000	38,400	0.00	0.00	0.07	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-23	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	37,700	35	2.94%	60%	0.62	0.11	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	38400	2.42	60000	38,400	0.00	0.00	0.11	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-23	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	37,700	35	2.94%	150%	1.54	0.27	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	38400	2.42	60000	38,400	0.00	0.00	0.27	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-23	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	37,700	35	2.94%	75%	0.77	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	38400	2.42	60000	38,400	0.00	0.00	0.14	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-23	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	37,700	35	2.94%	75%	0.77	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	38400	2.42	60000	38,400	0.00	0.00	0.14	0.0	0.1	0.1	0.07	0.07	0.06	0.72	0.93	3.37	
Dec-23	700	0	0.000%	100%	0.00	0.00	0.0		0	0	0.000%	100%	0.00	0.00	0.0	37,700	35	2.94%	100%	1.03	0.18	0.2	0	0	0.00%	100%	0.00	0.00	0.0	1.25	38400	2.42	60000	38,400	0.06	0.07	0.18	0.0	0.3	0.1	0.12	0.13	0.10	1.01	1.23	3.92	
Jan-24	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	38,300	10	2.94%	60%	0.18	0.03	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	39000	2.44	60000	39,000	0.10	0.13	0.03	0.0	0.2	0.1	0.08	0.08	0.07	0.79	1.00	3.51	
Feb-24	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	38,300	10	2.94%	75%	0.22	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39000	2.44	60000	39,000	0.07	0.08	0.04	0.0	0.1	0.1	0.06	0.06	0.05	0.68	0.88	3.27	
Mar-24	700	0	0.000%	70%	0.00	0.00	0.0		0	0	0.000%	70%	0.00	0.00	0.0	38,300	10	2.94%	70%	0.21	0.04	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	39000	2.44	60000	39,000	0.05	0.06	0.04	0.0	0.1	0.0	0.05	0.05	0.04	0.60	0.81	3.11	
Apr-24	700	0	0.000%	175%	0.00	0.00	0.0		0	0	0.000%	175%	0.00	0.00	0.0	38,300	10	2.94%	175%	0.51	0.09	0.1	0	0	0.00%	175%	0.00	0.00	0.0	1.25	39000	2.44	60000	39,000	0.04	0.05	0.09	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-24	700	0	0.000%	170%	0.00	0.00	0.0		0	0	0.000%	170%	0.00	0.00	0.0	38,300	10	2.94%	170%	0.50	0.09	0.1	0	0	0.00%	170%	0.00	0.00	0.0	1.25	39000	2.44	60000	39,000	0.00	0.00	0.09	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-24	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	38,300	10	2.94%	150%	0.44	0.08	0.1	0	0	0.00%	150%	0.00	0.00	0.0	1.25	39000	2.44	60000	39,000	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-24	700	0	0.000%	40%	0.00	0.00	0.0		0	0	0.000%	40%	0.00	0.00	0.0	38,300	10	2.94%	40%	0.12	0.02	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	39000	2.44	60000	39,000	0.00	0.00	0.02	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-24	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	38,300	10	2.94%	60%	0.18	0.03	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	39000	2.44	60000	39,000	0.00	0.00	0.03	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-24	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	38,300	10	2.94%	150%	0.44	0.08	0.1	0	0	0.00%	150%	0.00	0.00	0.0	1.25	39000	2.44	60000	39,000	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-24	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	38,300	10	2.94%	75%	0.22	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39000	2.44	60000	39,000	0.00	0.00	0.04	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-24	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	38,300	10	2.94%	75%	0.22	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39000	2.44	60000	39,000	0.00	0.00	0.04	0.0	0.0	0.0	0.02	0.02	0.02	0.36	0.53	2.47	
Dec-24	700	0	0.000%	100%	0.00	0.00	0.0		0	0	0.000%	100%	0.00	0.00	0.0	38,300	10	2.94%	100%	0.29	0.05	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	39000	2.44	60000	39,000	0.02	0.02	0.05	0.0	0.1	0.0	0.04	0.04	0.03	0.51	0.70	2.87	
Jan-25	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	38,900	0	2.94%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	39600	2.45	60000	39,600	0.03	0.04	0.00	0.0	0.0	0.0	0.02	0.02	0.02	0.35	0.51	2.43	

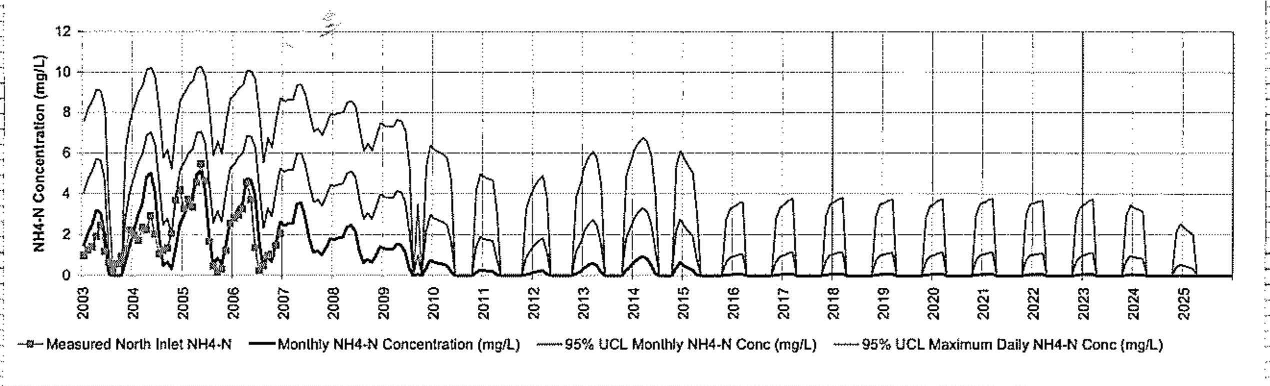
WLWB Ammonia Model - A418 to PKC Case

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154						
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)
Feb-25	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	38,900	0	2.94%	75%	0.00	0.00	0.0
Mar-25	700	0	0.000%	70%	0.00	0.00	0.0		0	0	0.000%	70%	0.00	0.00	0.0	38,900	0	2.94%	70%	0.00	0.00	0.0
Apr-25	700	0	0.000%	175%	0.00	0.00	0.0		0	0	0.000%	175%	0.00	0.00	0.0	38,900	0	2.94%	175%	0.00	0.00	0.0
May-25	700	0	0.000%	170%	0.00	0.00	0.0		0	0	0.000%	170%	0.00	0.00	0.0	38,900	0	2.94%	170%	0.00	0.00	0.0
Jun-25	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	38,900	0	2.94%	150%	0.00	0.00	0.0
Jul-25	700	0	0.000%	40%	0.00	0.00	0.0		0	0	0.000%	40%	0.00	0.00	0.0	38,900	0	2.94%	40%	0.00	0.00	0.0
Aug-25	700	0	0.000%	60%	0.00	0.00	0.0		0	0	0.000%	60%	0.00	0.00	0.0	38,900	0	2.94%	60%	0.00	0.00	0.0
Sep-25	700	0	0.000%	150%	0.00	0.00	0.0		0	0	0.000%	150%	0.00	0.00	0.0	38,900	0	2.94%	150%	0.00	0.00	0.0
Oct-25	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	38,900	0	2.94%	75%	0.00	0.00	0.0
Nov-25	700	0	0.000%	75%	0.00	0.00	0.0		0	0	0.000%	75%	0.00	0.00	0.0	38,900	0	2.94%	75%	0.00	0.00	0.0
Dec-25	700	0	0.000%	100%	0.00	0.00	0.0		0	0	0.000%	100%	0.00	0.00	0.0	38,900	0	2.94%	100%	0.00	0.00	0.0

	SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N Input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L	Actual NH4-N concentration (mg/L)
Feb-25	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39600	2.45	60000	39,600	0.02	0.02	0.00	0.0	0.0	0.0	0.01	0.01	0.01	0.24	0.38	2.06	
Mar-25	0	0	0.00%	70%	0.00	0.00	0.0	1.25	39600	2.45	60000	39,600	0.01	0.01	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.17	0.28	1.74	
Apr-25	0	0	0.00%	175%	0.00	0.00	0.0	1.25	39600	2.45	60000	39,600	0.00	0.00	0.00	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-25	0	0	0.00%	170%	0.00	0.00	0.0	1.25	39600	2.45	60000	39,600	0.00	0.00	0.00	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-25	0	0	0.00%	150%	0.00	0.00	0.0	1.25	39600	2.45	60000	39,600	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-25	0	0	0.00%	40%	0.00	0.00	0.0	1.25	39600	2.45	60000	39,600	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-25	0	0	0.00%	60%	0.00	0.00	0.0	1.25	39600	2.45	60000	39,600	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-25	0	0	0.00%	150%	0.00	0.00	0.0	1.25	39600	2.45	60000	39,600	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-25	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39600	2.45	60000	39,600	0.00	0.00	0.00	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-25	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39600	2.45	60000	39,600	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-25	0	0	0.00%	100%	0.00	0.00	0.0	1.25	39600	2.45	60000	39,600	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Increase North Inlet Case

WLWB AMMONIA MANAGEMENT MODEL OF DIAVIK PROJECT				
CASE:	Increase NI Storage			
BLASTING:	Current practices: open hole; 80/20 emulsion/ANFO mix; no liner; wet holes pumped and double primed; large area blasts			
AN USE:	Past and future use as per Diavik ADP projections (SNC-Lavalin, Ammonia Balance, May 2006)			
MINE INFLOW:	Actual to present, predicted inflows (Golder, 2006) in future.			
WATER MANAGEMENT:	All mine water discharged to North Inlet, increased in base capacity by 2 million cubic meters at start of 2007			
TREATMENT:	No additional treatment; natural biological degradation in North Inlet to continue at current rate.			
FLOW TO LAC DE GRAS:	Actual to present, future discharge equal to input in same month.			
RESULTS	FROM BEGINNING OF	03	07	08
AMMONIA (N) TO LDG	TO END OF	06	07	25
	Average	2.3	2.1	0.2
	Maximum 30 Day	5.1	3.5	2.5
	Maximum 1 Day	8.6	7.0	5.7
	Maximum 95% UCL 30 Day	7.1	6.0	5.1
	Maximum 95% UCL 1 Day	10.3	9.4	8.6



WLWB Ammonia Model - Increase North Inlet Case

Date	SURFACE MINE A154							
	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)
Jan-03	5,380	867	0.924%	60%	4.80	0.85	5.2	8.4
Feb-03	5,667	867	0.924%	75%	6.00	1.06	6.2	7.5
Mar-03	5,954	867	0.924%	70%	5.60	0.99	5.5	5.1
Apr-03	6,251	867	0.924%	175%	14.01	2.48	13.0	10.5
May-03	5,936	867	0.924%	170%	13.61	2.41	13.3	5.4
Jun-03	7,290	867	0.924%	150%	12.01	2.13	9.6	3.2
Jul-03	6,867	867	0.924%	40%	3.20	0.57	2.7	6.7
Aug-03	7,753	867	0.924%	60%	4.80	0.85	3.6	6.1
Sep-03	8,194	867	0.924%	150%	12.01	2.13	8.5	8.4
Oct-03	8,775	867	0.924%	75%	6.00	1.06	4.0	6.6
Nov-03	8,935	867	0.924%	75%	6.00	1.06	3.9	6.5
Dec-03	8,301	867	0.924%	100%	8.01	1.42	5.6	5.1
Jan-04	8,570	808	1.598%	60%	7.75	1.37	5.3	4.3
Feb-04	7,982	808	1.598%	75%	9.69	1.72	7.1	5.9
Mar-04	8,828	808	1.598%	70%	9.04	1.60	6.0	6.0
Apr-04	9,324	808	1.598%	175%	22.60	4.00	14.1	5.3
May-04	10,755	808	1.598%	170%	21.95	3.89	11.9	9.3
Jun-04	12,337	808	1.598%	150%	19.37	3.43	9.1	5.3
Jul-04	11,098	808	1.598%	40%	5.17	0.92	2.7	13.4
Aug-04	11,394	808	1.598%	60%	7.75	1.37	4.0	8.9
Sep-04	12,030	808	1.598%	150%	19.37	3.43	9.4	6.7
Oct-04	11,948	808	1.598%	75%	9.69	1.72	4.7	6.5
Nov-04	11,300	808	1.598%	75%	9.69	1.72	5.0	7.5
Dec-04	10,514	808	1.598%	100%	12.91	2.29	7.2	5.1
Jan-05	10,958	725	1.979%	60%	8.61	1.53	4.6	4.5
Feb-05	11,359	725	1.979%	75%	10.76	1.91	5.5	4.5
Mar-05	12,270	725	1.979%	70%	10.04	1.78	4.8	5.8
Apr-05	13,110	725	1.979%	175%	25.11	4.45	11.2	11.5
May-05	14,120	725	1.979%	170%	24.39	4.32	10.1	11.7
Jun-05	15,045	725	1.979%	150%	21.52	3.81	8.3	10.7
Jul-05	15,261	725	1.979%	40%	5.74	1.02	2.2	5.1
Aug-05	14,863	725	1.979%	60%	8.61	1.53	3.4	3.3
Sep-05	15,820	725	1.979%	150%	21.52	3.81	7.9	2.2
Oct-05	15,681	725	1.979%	75%	10.76	1.91	4.0	2.6
Nov-05	15,693	725	1.979%	75%	10.76	1.91	4.0	3.6
Dec-05	14,884	725	1.979%	100%	14.35	2.54	5.6	6.3
Jan-06	15,584	642	2.256%	60%	8.69	1.54	3.2	3.7
Feb-06	15,104	642	2.256%	75%	10.86	1.92	4.2	4.8
Mar-06	15,618	642	2.256%	70%	10.14	1.80	3.8	3.1
Apr-06	16,453	642	2.256%	175%	25.34	4.49	9.0	9.6
May-06	19,475	642	2.256%	170%	24.61	4.36	7.4	5.3
Jun-06	18,310	642	2.256%	150%	21.72	3.85	6.9	3.4
Jul-06	17,677	642	2.256%	40%	5.79	1.03	1.9	4.4
Aug-06	18,560	642	2.256%	60%	8.69	1.54	2.7	7.3
Sep-06	19,176	642	2.256%	150%	21.72	3.85	6.6	5.4
Oct-06	18,487	642	2.256%	75%	10.86	1.92	3.4	3.7
Nov-06	19,635	642	2.256%	75%	10.86	1.92	3.2	2.4
Dec-06	17,652	642	2.256%	100%	14.48	2.57	4.8	4.5
Jan-07	17,200	408	2.794%	60%	6.84	1.21	2.3	
Feb-07	17,200	408	2.794%	75%	8.56	1.52	2.9	
Mar-07	17,200	408	2.794%	70%	7.99	1.42	2.7	
Apr-07	17,200	408	2.794%	175%	19.96	3.54	6.8	
May-07	17,200	408	2.794%	170%	19.39	3.44	6.6	

Date	SURFACE MINE A418						
	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)
Jan-03	0	0	0.000%	60%	0.00	0.00	0.0
Feb-03	0	0	0.000%	75%	0.00	0.00	0.0
Mar-03	0	0	0.000%	70%	0.00	0.00	0.0
Apr-03	0	0	0.000%	175%	0.00	0.00	0.0
May-03	0	0	0.000%	170%	0.00	0.00	0.0
Jun-03	0	0	0.000%	150%	0.00	0.00	0.0
Jul-03	0	0	0.000%	40%	0.00	0.00	0.0
Aug-03	0	0	0.000%	60%	0.00	0.00	0.0
Sep-03	0	0	0.000%	150%	0.00	0.00	0.0
Oct-03	0	0	0.000%	75%	0.00	0.00	0.0
Nov-03	0	0	0.000%	75%	0.00	0.00	0.0
Dec-03	0	0	0.000%	100%	0.00	0.00	0.0
Jan-04	0	0	0.000%	60%	0.00	0.00	0.0
Feb-04	0	0	0.000%	75%	0.00	0.00	0.0
Mar-04	0	0	0.000%	70%	0.00	0.00	0.0
Apr-04	0	0	0.000%	175%	0.00	0.00	0.0
May-04	0	0	0.000%	170%	0.00	0.00	0.0
Jun-04	0	0	0.000%	150%	0.00	0.00	0.0
Jul-04	0	0	0.000%	40%	0.00	0.00	0.0
Aug-04	0	0	0.000%	60%	0.00	0.00	0.0
Sep-04	0	0	0.000%	150%	0.00	0.00	0.0
Oct-04	0	0	0.000%	75%	0.00	0.00	0.0
Nov-04	0	0	0.000%	75%	0.00	0.00	0.0
Dec-04	0	0	0.000%	100%	0.00	0.00	0.0
Jan-05	0	0	0.000%	60%	0.00	0.00	0.0
Feb-05	0	0	0.000%	75%	0.00	0.00	0.0
Mar-05	0	0	0.000%	70%	0.00	0.00	0.0
Apr-05	0	0	0.000%	175%	0.00	0.00	0.0
May-05	0	0	0.000%	170%	0.00	0.00	0.0
Jun-05	0	0	0.000%	150%	0.00	0.00	0.0
Jul-05	0	0	0.000%	40%	0.00	0.00	0.0
Aug-05	0	0	0.000%	60%	0.00	0.00	0.0
Sep-05	0	0	0.000%	150%	0.00	0.00	0.0
Oct-05	0	0	0.000%	75%	0.00	0.00	0.0
Nov-05	0	0	0.000%	75%	0.00	0.00	0.0
Dec-05	0	0	0.000%	100%	0.00	0.00	0.0
Jan-06	250	0	0.000%	60%	0.00	0.00	0.0
Feb-06	250	0	0.000%	75%	0.00	0.00	0.0
Mar-06	250	0	0.000%	70%	0.00	0.00	0.0
Apr-06	250	0	0.000%	175%	0.00	0.00	0.0
May-06	250	0	0.000%	170%	0.00	0.00	0.0
Jun-06	250	0	0.000%	150%	0.00	0.00	0.0
Jul-06	250	0	0.000%	40%	0.00	0.00	0.0
Aug-06	250	0	0.000%	60%	0.00	0.00	0.0
Sep-06	250	0	0.000%	150%	0.00	0.00	0.0
Oct-06	250	0	0.000%	75%	0.00	0.00	0.0
Nov-06	250	0	0.000%	75%	0.00	0.00	0.0
Dec-06	250	0	0.000%	100%	0.00	0.00	0.0
Jan-07	500	400	0.924%	60%	2.22	0.39	25.8
Feb-07	500	400	0.924%	75%	2.77	0.49	32.3
Mar-07	500	400	0.924%	70%	2.59	0.46	30.1
Apr-07	500	400	0.924%	175%	6.47	1.15	75.3
May-07	500	400	0.924%	170%	6.28	1.11	73.1

Date	UNDERGROUND MINES A418/A154						
	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)
Jan-03	0	0	0.00%	60%	0.00	0.00	0.0
Feb-03	0	0	0.00%	75%	0.00	0.00	0.0
Mar-03	0	0	0.00%	70%	0.00	0.00	0.0
Apr-03	0	0	0.00%	175%	0.00	0.00	0.0
May-03	0	0	0.00%	170%	0.00	0.00	0.0
Jun-03	0	0	0.00%	150%	0.00	0.00	0.0
Jul-03	0	0	0.00%	40%	0.00	0.00	0.0
Aug-03	0	0	0.00%	60%	0.00	0.00	0.0
Sep-03	0	0	0.00%	150%	0.00	0.00	0.0
Oct-03	0	0	0.00%	75%	0.00	0.00	0.0
Nov-03	0	0	0.00%	75%	0.00	0.00	0.0
Dec-03	0	0	0.00%	100%	0.00	0.00	0.0
Jan-04	0	0	0.00%	60%	0.00	0.00	0.0
Feb-04	0	0	0.00%	75%	0.00	0.00	0.0
Mar-04	0	0	0.00%	70%	0.00	0.00	0.0
Apr-04	0	0	0.00%	175%	0.00	0.00	0.0
May-04	0	0	0.00%	170%	0.00	0.00	0.0
Jun-04	0	0	0.00%	150%	0.00	0.00	0.0
Jul-04	0	0	0.00%	40%	0.00	0.00	0.0
Aug-04	0	0	0.00%	60%	0.00	0.00	0.0
Sep-04	0	0	0.00%	150%	0.00	0.00	0.0
Oct-04	0	0	0.00%	75%	0.00	0.00	0.0
Nov-04	0	0	0.00%	75%	0.00	0.00	0.0
Dec-04	0	0	0.00%	100%	0.00	0.00	0.0
Jan-05	0	0	0.00%	60%	0.00	0.00	0.0
Feb-05	0	0	0.00%	75%	0.00	0.00	0.0
Mar-05	0	0	0.00%	70%	0.00	0.00	0.0
Apr-05	0	0	0.00%	175%	0.00	0.00	0.0
May-05	0	0	0.00%	170%	0.00	0.00	0.0
Jun-05	0	0	0.00%	150%	0.00	0.00	0.0
Jul-05	0	0	0.00%	40%	0.00	0.00	0.0
Aug-05	0	0	0.00%	60%	0.00	0.00	0.0
Sep-05	0	0	0.00%	150%	0.00	0.00	0.0
Oct-05	0	0	0.00%	75%	0.00	0.00	0.0
Nov-05	0	0	0.00%	75%	0.00	0.00	0.0
Dec-05	0	0	0.00%	100%	0.00	0.00	0.0
Jan-06	0	46	2.94%	60%	0.81	0.14	#DIV/0!
Feb-06	0	46	2.94%	75%	1.01	0.18	#DIV/0!
Mar-06	0	46	2.94%	70%	0.94	0.17	#DIV/0!
Apr-06	0	46	2.94%	175%	2.35	0.42	#DIV/0!
May-06	0	46	2.94%	170%	2.28	0.40	#DIV/0!
Jun-06	22	46	2.94%	150%	2.01	0.36	531.3
Jul-06	40	46	2.94%	40%	0.54	0.10	77.3
Aug-06	38	46	2.94%	60%	0.81	0.14	122.6
Sep-06	154	46	2.94%	150%	2.01	0.36	76.1
Oct-06	430	46	2.94%	75%	1.01	0.18	13.6
Nov-06	687	46	2.94%	75%	1.01	0.18	8.5
Dec-06	929	46	2.94%	100%	1.34	0.24	8.4
Jan-07	8,200	33	2.94%	60%	0.57	0.10	0.4
Feb-07	8,200	33	2.94%	75%	0.72	0.13	0.5
Mar-07	8,200	33	2.94%	70%	0.67	0.12	0.5
Apr-07	8,200	33	2.94%	175%	1.67	0.30	1.2
May-07	8,200	33	2.94%	170%	1.62	0.29	1.2

Date	SURFACE MINE A21						
	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)
Jan-03	0	0	0.00%	60%	0.00	0.00	0.0
Feb-03	0	0	0.00%	75%	0.00	0.00	0.0
Mar-03	0	0	0.00%	70%	0.00	0.00	0.0
Apr-03	0	0	0.00%	175%	0.00	0.00	0.0
May-03	0	0	0.00%	170%	0.00	0.00	0.0
Jun-03	0	0	0.00%	150%	0.00	0.00	0.0
Jul-03	0	0	0.00%	40%	0.00	0.00	0.0
Aug-03	0	0	0.00%	60%	0.00	0.00	0.0
Sep-03	0	0	0.00%	150%	0.00	0.00	0.0
Oct-03	0	0	0.00%	75%	0.00	0.00	0.0
Nov-03	0	0	0.00%	75%	0.00	0.00	0.0
Dec-03	0	0	0.00%	100%	0.00	0.00	0.0
Jan-04	0	0	0.00%	60%	0.00	0.00	0.0
Feb-04	0	0	0.00%	75%	0.00	0.00	0.0
Mar-04	0	0	0.00%	70%	0.00	0.00	0.0
Apr-04	0	0	0.00%	175%	0.00	0.00	0.0
May-04	0	0	0.00%	170%	0.00	0.00	0.0
Jun-04	0	0	0.00%	150%	0.00	0.00	0.0
Jul-04	0	0	0.00%	40%	0.00	0.00	0.0
Aug-04	0	0	0.00%	60%	0.00	0.00	0.0
Sep-04	0	0	0.00%	150%	0.00	0.00	0.0
Oct-04	0	0	0.00%	75%	0.00	0.00	0.0
Nov-04	0	0	0.00%	75%	0.00	0.00	0.0
Dec-04	0	0	0.00%	100%	0.00	0.00	0.0
Jan-05	0	0	0.00%	60%	0.00	0.00	0.0
Feb-05	0	0	0.00%	75%	0.00	0.00	0.0
Mar-05	0	0	0.00%	70%	0.00	0.00	0.0
Apr-05	0	0	0.00%	175%	0.00	0.00	0.0
May-05	0	0	0.00%	170%	0.00	0.00	0.0
Jun-05	0	0	0.00%	150%	0.00	0.00	0.0
Jul-05	0	0	0.00%	40%	0.00	0.00	0.0
Aug-05	0	0	0.00%	60%	0.00	0.00	0.0
Sep-05	0	0	0.00%	150%	0.00	0.00	0.0
Oct-05	0	0	0.00%	75%	0.00	0.00	0.0
Nov-05	0	0	0.00%	75%	0.00	0.00	0.0
Dec-05	0	0	0.00%	100%	0.00	0.00	0.0
Jan-06	0	0	0.00%	60%	0.00	0.00	0.0
Feb-06	0	0	0.00%	75%	0.00	0.00	0.0
Mar-06	0	0	0.00%	70%	0.00	0.00	0.0
Apr-06	0	0	0.00%	175%	0.00	0.00	0.0
May-06	0	0	0.00%	170%	0.00	0.00	0.0
Jun-06	0	0	0.00%	150%	0.00	0.00	0.0
Jul-06	0	0	0.00%	40%	0.00	0.00	0.0
Aug-06	0	0	0.00%	60%	0.00	0.00	0.0
Sep-06	0	0	0.00%	150%	0.00	0.00	0.0
Oct-06	0	0	0.00%	75%	0.00	0.00	0.0
Nov-06	0	0	0.00%	75%	0.00	0.00	0.0
Dec-06	0	0	0.00%	100%	0.00	0.00	0.0
Jan-07	0	0	0.00%	60%	0.00	0.00	0.0
Feb-07	0	0	0.00%	75%	0.00	0.00	0.0
Mar-07	0	0	0.00%	70%	0.00	0.00	0.0
Apr-07	0	0	0.00%	175%	0.00	0.00	0.0
May-07	0	0	0.00%	170%	0.00	0.00	0.0

Date	NORTH INLET							
	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)
Jan-03	1.25	5380	1.41	32000	17,905	1.00	1.25	0.85
Feb-03	1.25	5667	1.42	32000	17,175	1.49	1.86	1.06
Mar-03	1.25	5954	1.43	32000	16,854	2.05	2.57	0.99
Apr-03	1.25	6251	1.44	32000	16,875	2.49	3.11	2.48
May-03	1.25	5936	1.43	32000	25,514	3.19	3.99	2.41
Jun-03	1.25	7290	1.47	32000	29,485	3.07	3.84	2.13
Jul-03	1.25	6867	1.46	32000	28,379	2.02	2.52	0.57
Aug-03	1.25	7753	1.49	32000	27,136	0.06	0.08	0.85
Sep-03	1.25	8194	1.50	32000	29,865	0.00	0.00	2.13
Oct-03	1.25	8775	1.52	32000	27,977	0.00	0.00	1.06
Nov-03	1.25	8935	1.52	32000	15,411	0.00	0.00	1.06
Dec-03	1.25	8301	1.50	32000	24,385	0.70	0.87	1.42
Jan-04	1.25	8570	1.51	32000	13,372	1.53	1.91	1.37
Feb-04	1.25	7982	1.49	32000	7,407	2.17	2.71	1.72
Mar-04	1.25	8828	1.52	32000	3,826	2.97	3.71	1.60
Apr-04	1.25	9324	1.53	32000	0	3.50	4.37	4.00
May-04	1.25	10755	1.58	32000	0	4.81	6.01	3.89
Jun-04	1.25	12337	1.63	32000	16,027	5.01	6.26	3.43
Jul-04	1.25	11098	1.59	32000	25,310	4.12	5.15	0.92
Aug-04	1.25	11394	1.60	32000	28,658	1.93	2.41	1.37
Sep-04	1.25	12030	1.62	32000	27,577	0.49	0.62	3.43
Oct-04	1.25	11948	1.61	32000	13,563	0.65	0.81	1.72
Nov-04	1.25	11300	1.59	32000	12,590	0.33	0.41	1.72
Dec-04	1.25	10514	1.57	32000	11,561	1.33	1.67	2.29
Jan-05	1.25	10958	1.58	32000	10,692	2.52	3.15	1.53
Feb-05	1.25	11359	1.60	32000	12,385	2.95	3.69	1.91
Mar-05	1.25	12270	1.62	32000	12,748	3.51	4.39	1.78
Apr-05	1.25	13110	1.65	32000	13,667	3.80	4.75	4.45
May-05	1.25	14120	1.68	32000	16,000	4.97	6.22	4.32
Jun-05	1.25	15045	1.71	32000	17,531	5.08	6.35	3.81
Jul-05	1.25	15261	1.71	32000	8,477	4.20	5.25	1.02
Aug-05	1.25	14863	1.70	32000	17,738	1.90	2.38	1.53
Sep-05	1.25	15820	1.73	32000	24,395	0.53	0.67	3.81
Oct-05	1.25	15681	1.73	32000	21,915	0.86	1.07	1.91
Nov-05	1.25	15693	1.73	32000	17,253	0.57	0.71	1.91
Dec-05	1.25	14884	1.70	32000	14,961	1.51	1.89	2.54
Jan-06	1.25	15834	1.73	32000	15,041	2.60	3.26	1.68
Feb-06	1.25	15354	1.72	32000	15,114	2.85	3.56	2.10
Mar-06	1.25	15868	1.73	32000	19,356	3.30	4.13	1.96
Apr-06	1.25	16703	1.76	32000	17,439	3.51	4.39	4.91
May-06	1.25	19725	1.85	32000	20,203	4.72	5.90	4.77
Jun-06	1.25	18582	1.82	32000	27,717	4.69	5.86	4.21
Jul-06	1.25	17967	1.80	32000	22,154	3.89	4.86	1.12
Aug-06	1.25	18849	1.82	32000	18,801	1.66	2.08	1.68
Sep-06	1.25	19580	1.85	32000	25,748	0.42	0.52	4.21
Oct-06	1.25	19166	1.83	32000	26,010	0.94	1.17	2.10
Nov-06	1.25	20572	1.88	32000	23,981	0.69	0.87	2.10
Dec-06	1.25	18831	1.82	32000	19,976	1.58	1.98	2.80
Jan-07	1.25	25900	2.04	32000	25,900	2.62	3.28	1.71
Feb-07	1.25	25900	2.04	32000	25,900	2.45	3.06	2.13
Mar-07	1.25	25900	2.04	32000	25,900	2.55	3.19	1.99
Apr-07	1.25	25900	2.04	32000	25,900	2.54	3.18	4.98
May-07	1.25	25900	2.04	45000	25,900	3.51	4.39	4.84

Date	NORTH INLET									
	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Jan-03	0.0	2.1	1.5	0.81	1.29	1.49	4.35	4.06	7.57	1.0
Feb-03	0.0	2.9	2.1	1.07	1.85	2.05	5.20	4.70	8.20	1.3
Mar-03	0.0	3.6	2.5	1.28	2.29	2.49	5.78	5.12	8.60	1.4
Apr-03	1.0	4.6	3.2	1.64	2.96	3.19	6.62	5.73	9.14	1.9
May-03	2.0	4.4	3.1	2.39	2.01	3.07	6.49	5.64	9.06	2.5
Jun-03	3.0	3.0	2.0	1.81	1.16	2.02	5.15	4.66	8.16	1.2
Jul-03	3.0	0.1	0.1	0.05	0.04	0.06	0.76	0.98	3.45	0.6
Aug-03	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.2
Sep-03	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.6
Oct-03	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.9
Nov-03	0.0	1.1	0.7	0.33	0.74	0.70	2.87	2.89	6.28	1.3
Dec-03	0.0	2.3	1.5	1.13	1.16	1.53	4.42	4.11	7.62	2.2
Jan-04	0.0	3.3	2.2	0.88	2.40	2.17	5.36	4.82	8.31	2.0
Feb-04	0.0	4.4	3.0	0.67	3.76	2.97	6.37	5.55	8.98	1.7
Mar-04	0.0	5.3	3.5	0.41	4.91	3.50	6.97	5.97	9.35	2.4
Apr-04	1.0	7.4	4.8	0.00	7.38	4.81	8.30	6.89	10.12	2.2
May-04	2.0	7.9	5.0	0.00	7.90	5.01	8.49	7.02	10.22	2.9
Jun-04	3.0	6.7	4.1	2.01	4.69	4.12	7.63	6.43	9.74	2.0
Jul-04	3.0	3.1	1.9	1.49	1.58	1.93	5.03	4.57	8.07	1.1
Aug-04	3.0	0.8	0.5	0.43	0.36	0.49	2.37	2.47	5.76	1.2
Sep-04	3.0	1.0	0.6	0.54	0.50	0.65	2.76	2.80	6.17	1.3
Oct-04	2.0	0.5	0.3	0.14	0.39	0.33	1.89	2.06	5.20	2.1
Nov-04	0.0	2.1	1.3	0.51	1.61	1.33	4.10	3.87	7.37	3.7
Dec-04	0.0	4.0	2.5	0.89	3.07	2.52	5.82	5.15	8.62	4.2
Jan-05	0.0	4.7	3.0	0.96	3.72	2.95	6.35	5.53	8.97	3.3
Feb-05	0.0	5.6	3.5	1.32	4.28	3.51	6.98	5.98	9.36	3.7
Mar-05	0.0	6.2	3.8	1.47	4.69	3.80	7.29	6.20	9.55	3.4
Apr-05	1.0	8.2	5.0	2.07	6.13	4.97	8.46	7.00	10.20	4.6
May-05	2.0	8.5	5.1	2.47	6.06	5.08	8.56	7.07	10.26	5.5
Jun-05	3.0	7.2	4.2	2.24	4.93	4.20	7.70	6.48	9.79	4.6
Jul-05	3.0	3.3	1.9	0.49	2.77	1.90	4.99	4.54	8.05	1.7
Aug-05	3.0	0.9	0.5	0.29	0.62	0.53	2.48	2.56	5.87	0.5
Sep-05	3.0	1.5	0.9	0.63	0.85	0.86	3.21	3.17	6.60	0.2
Oct-05	2.0	1.0	0.6	0.38	0.60	0.57	2.56	2.63	5.96	0.3
Nov-05	0.0	2.6	1.5	0.79	1.82	1.51	4.40	4.10	7.60	1.2
Dec-05	0.0	4.4	2.6	1.19	3.25	2.60	5.92	5.23	8.69	2.6
Jan-06	0.0	4.9	2.9	1.30	3.63	2.85	6.23	5.45	8.89	2.8
Feb-06	0.0	5.7	3.3	1.52	4.15	3.30	6.75	5.82	9.22	3.0
Mar-06	0.0	6.1	3.5	2.07	4.02	3.51	6.99	5.99	9.36	3.3
Apr-06	1.0	8.3	4.7	2.50	5.80	4.72	8.22	6.84	10.07	4.6
May-06	2.0	8.7	4.7	2.88	5.79	4.69	8.18	6.81	10.06	3.7
Jun-06	3.0	7.1	3.9	3.28	3.78	3.89	7.39	6.27	9.60	1.4
Jul-06	3.0	3.0	1.7	1.12	1.87	1.66	4.63	4.27	7.78	0.2
Aug-06	3.0	0.8	0.4	0.24	0.52	0.42	2.16	2.29	5.52	0.5
Sep-06	3.0	1.7	0.9	0.73	0.99	0.94	3.37	3.30	6.75	1.0
Oct-06	2.0	1.3	0.7	0.55	0.72	0.69	2.86	2.88	6.27	1.1
Nov-06	0.0	3.0	1.6	1.16	1.82	1.58	4.51	4.18	7.69	1.5
Dec-06	0.0	4.8	2.6	1.59	3.19	2.62	5.95	5.25	8.71	2.1
Jan-07	0.0	5.0	2.4	1.93	3.06	2.45	5.73	5.09	8.56	
Feb-07	0.0	5.2	2.5	2.01	3.19	2.55	5.86	5.18	8.65	
Mar-07	0.0	5.2	2.5	2.00	3.18	2.54	5.85	5.17	8.64	
Apr-07	1.0	7.2	3.5	2.77	4.39	3.51	6.98	5.98	9.36	
May-07	2.0	7.2	3.5	2.79	4.43	3.55	7.02	6.01	9.39	

WLWB Ammonia Model - Increase North Inlet Case

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Jun-07	17,200	408	2.794%	150%	17.11	3.03	5.8		500	400	0.924%	150%	5.54	0.98	64.5	8,200	33	2.94%	150%	1.43	0.25	1.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	25900	2.04	45000	25,900	3.55	4.43	4.27	3.0	5.7	2.8	2.20	3.50	2.80	6.16	5.40	8.85	
Jul-07	17,200	408	2.794%	40%	4.56	0.81	1.5		500	400	0.924%	40%	1.48	0.26	17.2	8,200	33	2.94%	40%	0.38	0.07	0.3	0	0	0.00%	40%	0.00	0.00	0.0	3.25	25900	4.04	45000	25,900	2.80	9.09	1.14	3.0	7.2	1.8	1.41	5.82	1.79	4.82	4.42	7.93	
Aug-07	17,200	408	2.794%	60%	6.84	1.21	2.3		500	400	0.924%	60%	2.22	0.39	25.8	8,200	33	2.94%	60%	0.57	0.10	0.4	0	0	0.00%	60%	0.00	0.00	0.0	3.25	25900	4.04	45000	25,900	1.79	5.82	1.71	3.0	4.5	1.1	0.88	3.64	1.12	3.73	3.58	7.06	
Sep-07	17,200	408	2.794%	150%	17.11	3.03	5.8		500	400	0.924%	150%	5.54	0.98	64.5	8,200	33	2.94%	150%	1.43	0.25	1.0	0	0	0.00%	150%	0.00	0.00	0.0	3.25	25900	4.04	45000	25,900	1.12	3.64	4.27	3.0	4.9	1.2	0.96	3.95	1.22	3.90	3.71	7.20	
Oct-07	17,200	408	2.794%	75%	8.56	1.52	2.9		500	400	0.924%	75%	2.77	0.49	32.3	8,200	33	2.94%	75%	0.72	0.13	0.5	0	0	0.00%	75%	0.00	0.00	0.0	3.25	25900	4.04	45000	25,900	1.22	3.95	2.13	2.0	4.1	1.0	0.80	3.29	1.01	3.52	3.42	6.88	
Nov-07	17,200	408	2.794%	75%	8.56	1.52	2.9		500	400	0.924%	75%	2.77	0.49	32.3	8,200	33	2.94%	75%	0.72	0.13	0.5	0	0	0.00%	75%	0.00	0.00	0.0	3.25	25900	4.04	45000	25,900	1.01	3.29	2.13	0.0	5.4	1.3	1.06	4.37	1.34	4.12	3.88	7.38	
Dec-07	17,200	408	2.794%	100%	11.41	2.02	3.9		500	400	0.924%	100%	3.69	0.65	43.0	8,200	33	2.94%	100%	0.96	0.17	0.7	0	0	0.00%	100%	0.00	0.00	0.0	3.25	25900	4.04	45000	25,900	1.34	4.37	2.85	0.0	7.2	1.8	1.41	5.81	1.79	4.82	4.41	7.92	
Jan-08	8,950	90	2.794%	60%	1.51	0.27	1.0		500	808	1.598%	60%	7.75	1.37	90.2	24,600	28	2.94%	60%	0.50	0.09	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	1.79	5.81	1.73	0.0	7.5	1.8	1.82	5.71	1.76	4.77	4.38	7.89	
Feb-08	8,950	90	2.794%	75%	1.89	0.33	1.2		500	808	1.598%	75%	9.69	1.72	112.8	24,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	1.76	5.71	2.16	0.0	7.9	1.8	1.90	5.97	1.84	4.89	4.47	7.98	
Mar-08	8,950	90	2.794%	70%	1.76	0.31	1.1		500	808	1.598%	70%	9.04	1.60	105.3	24,600	28	2.94%	70%	0.58	0.10	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	1.84	5.97	2.02	0.0	8.0	1.9	1.93	6.06	1.86	4.93	4.50	8.00	
Apr-08	8,950	90	2.794%	175%	4.40	0.78	2.9		500	808	1.598%	175%	22.60	4.00	263.2	24,600	28	2.94%	175%	1.46	0.26	0.3	0	0	0.00%	175%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	1.86	6.06	5.04	1.0	10.1	2.4	2.44	7.66	2.36	5.61	5.00	8.48	
May-08	8,950	90	2.794%	170%	4.27	0.76	2.8		500	808	1.598%	170%	21.95	3.89	255.6	24,600	28	2.94%	170%	1.42	0.25	0.3	0	0	0.00%	170%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	2.36	7.66	4.90	2.0	10.6	2.5	2.55	8.01	2.46	5.75	5.10	8.58	
Jun-08	8,950	90	2.794%	150%	3.77	0.67	2.5		500	808	1.598%	150%	19.37	3.43	225.6	24,600	28	2.94%	150%	1.25	0.22	0.3	0	0	0.00%	150%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	2.46	8.01	4.32	3.0	9.3	2.2	2.25	7.08	2.18	5.37	4.83	8.32	
Jul-08	8,950	90	2.794%	40%	1.01	0.18	0.7		500	808	1.598%	40%	5.17	0.92	60.2	24,600	28	2.94%	40%	0.33	0.06	0.1	0	0	0.00%	40%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	2.18	7.08	1.15	3.0	5.2	1.2	1.26	3.96	1.22	3.90	3.72	7.21	
Aug-08	8,950	90	2.794%	60%	1.51	0.27	1.0		500	808	1.598%	60%	7.75	1.37	90.2	24,600	28	2.94%	60%	0.50	0.09	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	1.22	3.96	1.73	3.0	2.7	0.6	0.65	2.04	0.63	2.71	2.76	6.12	
Sep-08	8,950	90	2.794%	150%	3.77	0.67	2.5		500	808	1.598%	150%	19.37	3.43	225.6	24,600	28	2.94%	150%	1.25	0.22	0.3	0	0	0.00%	150%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	0.63	2.04	4.32	3.0	3.4	0.8	0.81	2.55	0.79	3.06	3.05	6.46	
Oct-08	8,950	90	2.794%	75%	1.89	0.33	1.2		500	808	1.598%	75%	9.69	1.72	112.8	24,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	0.79	2.55	2.16	2.0	2.7	0.6	0.66	2.06	0.63	2.72	2.77	6.13	
Nov-08	8,950	90	2.794%	75%	1.89	0.33	1.2		500	808	1.598%	75%	9.69	1.72	112.8	24,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	0.63	2.06	2.16	0.0	4.2	1.0	1.02	3.20	0.98	3.47	3.38	6.83	
Dec-08	8,950	90	2.794%	100%	2.51	0.45	1.6		500	808	1.598%	100%	12.91	2.29	150.4	24,600	28	2.94%	100%	0.83	0.15	0.2	0	0	0.00%	100%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	0.98	3.20	2.88	0.0	6.1	1.4	1.47	4.61	1.42	4.24	3.98	7.48	
Jan-09	700	0	0.000%	60%	0.00	0.00	0.0		500	600	1.979%	60%	7.13	1.26	83.0	40,900	18	2.94%	60%	0.31	0.05	0.0	0	0	0.00%	60%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	1.42	4.61	1.32	0.0	5.9	1.3	1.68	4.25	1.31	4.06	3.84	7.33	
Feb-09	700	0	0.000%	75%	0.00	0.00	0.0		500	600	1.979%	75%	8.91	1.58	103.7	40,900	18	2.94%	75%	0.39	0.07	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	1.31	4.25	1.65	0.0	5.9	1.3	1.67	4.23	1.30	4.05	3.83	7.32	
Mar-09	700	0	0.000%	70%	0.00	0.00	0.0		500	600	1.979%	70%	8.31	1.47	96.8	40,900	18	2.94%	70%	0.36	0.06	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	1.30	4.23	1.54	0.0	5.8	1.3	1.63	4.14	1.27	4.00	3.79	7.28	
Apr-09	700	0	0.000%	175%	0.00	0.00	0.0		500	600	1.979%	175%	20.78	3.68	242.0	40,900	18	2.94%	175%	0.90	0.16	0.1	0	0	0.00%	175%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	1.27	4.14	3.84	1.0	7.0	1.5	1.97	5.01	1.54	4.44	4.13	7.64	
May-09	700	0	0.000%	170%	0.00	0.00	0.0		500	600	1.979%	170%	20.19	3.58	235.1	40,900	18	2.94%	170%	0.87	0.16	0.1	0	0	0.00%	170%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	1.54	5.01	3.73	2.0	6.7	1.5	1.91	4.84	1.49	4.35	4.07	7.57	
Jun-09	700	0	0.000%	150%	0.00	0.00	0.0		500	600	1.979%	150%	17.81	3.16	207.4	40,900	18	2.94%	150%	0.77	0.14	0.1	0	0	0.00%	150%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	1.49	4.84	3.29	3.0	5.1	1.1	1.45	3.68	1.13	3.75	3.60	7.07	
Jul-09	700	0	0.000%	40%	0.00	0.00	0.0		500	600	1.979%	40%	4.75	0.84	55.3	40,900	18	2.94%	40%	0.21	0.04	0.0	0	0	0.00%	40%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	1.13	3.68	0.88	3.0	1.6	0.3	0.44	1.12	0.34	1.95	2.10	5.27	
Aug-09	700	0	0.000%	60%	0.00	0.00	0.0		500	600	1.979%	60%	7.13	1.26	83.0	40,900	18	2.94%	60%	0.31	0.05	0.0	0	0	0.00%	60%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	0.34	1.12	1.32	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-09	700	0	0.000%	150%	0.00	0.00	0.0		500	600	1.979%	150%	17.81	3.16	207.4	40,900	18	2.94%	150%	0.77	0.14	0.1	0	0	0.00%	150%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	0.00	0.00	3.29	3.0	0.3	0.1	0.08	0.21	0.06	0.78	0.99	3.48	
Oct-09	700	0	0.000%	75%	0.00	0.00	0.0		500	600	1.979%	75%	8.91	1.58	103.7	40,900	18	2.94%	75%	0.39	0.07	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	0.06	0.21	1.65	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-09	700	0	0.000%	75%	0.00	0.00	0.0		500	600	1.979%	75%	8.91	1.58	103.7	40,900	18	2.94%	75%	0.39	0.07	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	0.00	0.00	1.65	0.0	1.6	0.4	0.47	1.18	0.36	2.01	2.16	5.34	
Dec-09	700	0	0.000%	100%	0.00	0.00	0.0		500	600	1.979%	100%	11.88	2.10	138.3	40,900	18	2.94%	100%	0.51	0.09	0.1	0	0	0.00%	100%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	0.36	1.18	2.20	0.0	3.4	0.7	0.95	2.42	0.75	2.98	2.98	6.38	
Jan-10	700	0	0.000%	60%	0.00	0.00	0.0		500	183	2.256%	60%	2.48	0.44	28.9	39,200	11	2.94%	60%	0.19	0.03	0.0	0	0	0.00%	60%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.75	2.42	0.47	0.0	2.9	0.6	0.79	2.10	0.65	2.75	2.79	6.16	
Feb-10	700	0	0.000%	75%	0.00	0.00	0.0		500	183	2.256%	75%	3.10	0.55	36.1	39,200	11	2.94%	75%	0.24	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.65	2.10	0.59	0.0	2.7	0.6	0.74	1.96	0.60	2.65	2.70	6.05	
Mar-10	700	0	0.000%	70%	0.00	0.00	0.0		500	183	2.256%	70%	2.90	0.51	33.7	39,200	11	2.94%	70%	0.22	0.04	0.0	0	0	0.00%	70%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.60	1.96	0.55	0.0	2.5	0.6	0.69	1.82	0.56	2.54	2.62	5.94	
Apr-10	700	0	0.000%	175%	0.00	0.00	0.0		500	183	2.256%	175%	7.24	1.28	84.3	39,200	11	2.94%	175%	0.56	0.10	0.1	0	0	0.00%	175%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.56	1.82	1.38	1.0	2.2	0.5	0.60	1.60	0.49	2.37	2.47	5.76	
May-10	700	0	0.000%	170%	0.00	0.00	0.0		500	183	2.256%	170%	7.03	1.25	81.9	39,200	11	2.94%	170%	0.55	0.10	0.1	0	0	0.00%	170%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.49	1.60	1.34	2.0	0.9	0.2	0.26	0.68	0.21	1.48	1.68	4.66	
Jun-10	700	0	0.000%	150%	0.00	0.00	0.0		500	183	2.256%	150%	6.21	1.10	72.3	39,200	11	2.94%	150%	0.48	0.09	0.1	0	0	0.00%	150%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.21	0.68	1.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-10	700	0	0.000%	40%	0.00	0.00	0.0		500	183	2.256%	40%	1.65	0.29	19.3	39,200	11	2.94%	40%	0.13	0.02	0.0	0	0	0.00%	40%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.00	0.00	0.32	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-10	700	0	0.000%	60%	0.00	0.00	0.0		500	183	2.256%	60%	2.48	0.44	28.9	39,200	11	2.94%	60%	0.19	0.03	0.0	0	0	0.00%	60%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.00	0.00	0.47	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-10	700	0	0.000%	150%	0.00	0.00	0.0		500	183	2.256%	150%	6.21	1.10	72.3	39,200	11	2.94%	150%	0.48	0.09	0.1	0	0	0.00%	150%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.00	0.00	1.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-10	700	0	0.000%	75%	0.00	0.00	0.0		500	183	2.256%	75%	3.10	0.55	36.1	39,200	11	2.94%	75%	0.24	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.00	0.00	0.59	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-10	700	0	0.000%	75%	0.00	0.00	0.0		500	183	2.256%	75%	3.10	0.55	36.1	39,200	11	2.94%	75%	0.24	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.00	0.00	0.59	0.0	0.6	0.1	0.16	0.43	0.13	1.15	1.37	4.16	
Dec-10	700	0	0.000%	100%	0.00	0.00	0.0		500	183	2.256%	100%	4.14	0.73	48.2	39,200	11	2.94%	100%	0.32	0.06	0.0	0	0	0.00%	100%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.13	0.43	0.79	0.0	1.2	0.3	0.33	0.89	0.27	1.71	1.89	4.97	
Jan-11	700	0	0.000%	60%	0.00	0.00	0.0		500	23	2.794%	60%	0.39	0.07	4.6	37,400	33	2.94%	60%	0.57	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.27	0.89	0.17	0.0	1.1	0.2	0.28	0.78	0.24	1.59	1.78	4.81	
Feb-11	700	0	0.000%	75%	0.00	0.00	0.0		500	23	2.794%	75%	0.49	0.09	5.7	37,400	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.24	0.78	0.21	0.0	1.0	0.2	0.26	0.73	0.22	1.54	1.73	4.74	
Mar-11	700	0	0.000%	70%	0.00	0.00	0.0		500	23	2.794%	70%	0.46	0.08	5.3	37,400	33	2.94%	70%	0.67	0.12	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.22	0.73	0.20	0.0	0.9	0.2	0.25	0.68	0.21	1.48	1.68	4.66	
Apr-11	700	0	0.000%	175%	0.00	0.00	0.0		500	23	2.794%	175%	1.14	0.20	13.3	37,400	33	2.94%	175%	1.67	0.30	0.3	0	0	0.00%	175%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.21	0.68	0.50	1.0	0.2	0.0	0.05	0.13	0.04	0.60	0.80	3.10	
May-11	700	0	0.000%	170%	0.00	0.00	0.0		500	23	2.794%	170%	1.11	0.20	12.9	37,400	33	2.94%	170%	1.62	0.29	0.3	0	0	0.00%	170%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.04	0.13	0.48	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-11	700	0	0.000%	150%	0.00	0.00	0.0		500	23	2.794%	150%	0.98	0.17	11.4	37,400	33	2.94%	150%	1.43	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.00	0.00	0.43	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-11	700	0	0.000%	40%	0.00	0.00	0.0		500	23	2.794%	40%	0.26	0.05	3.0	37,400	33	2.94%	40%	0.38	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.00	0.00	0.11	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-11	700	0	0.000%	60%	0.00	0.00	0.0		500	23	2.794%	60%	0.39	0.07	4.6	37,400	33	2.94%	60%	0.57	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.00	0.00	0.17	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-11	700	0	0.000%	150%	0.00	0.00	0.0		500	23	2.794%	150%	0.98	0.17	11.4	37,400	33	2.94%	150%	1.43	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.00	0.00	0.43	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-11	700	0	0.000%	75%	0.00	0.00	0.0		500	23	2.794%	75%	0.49	0.09	5.7	37,400	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.00	0.00	0.21	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Increase North Inlet Case

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Nov-11	700	0	0.000%	75%	0.00	0.00	0.0		500	23	2.794%	75%	0.49	0.09	5.7	37,400	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.00	0.00	0.21	0.0	0.2	0.0	0.06	0.16	0.05	0.66	0.87	3.24	
Dec-11	700	0	0.000%	100%	0.00	0.00	0.0		500	23	2.794%	100%	0.65	0.12	7.6	37,400	33	2.94%	100%	0.96	0.17	0.1	0	0	0.00%	100%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.05	0.16	0.28	0.0	0.4	0.1	0.12	0.32	0.10	0.99	1.21	3.88	
Jan-12	700	0	0.000%	60%	0.00	0.00	0.0		500	1	2.794%	60%	0.02	0.00	0.2	37,350	30	2.94%	60%	0.53	0.09	0.1	2,100	190	0.92%	60%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.10	0.32	0.41	0.0	0.7	0.2	0.20	0.53	0.16	1.29	1.50	4.38	
Feb-12	700	0	0.000%	75%	0.00	0.00	0.0		500	1	2.794%	75%	0.02	0.00	0.3	37,350	30	2.94%	75%	0.66	0.12	0.1	2,100	190	0.92%	75%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.16	0.53	0.43	0.0	1.0	0.2	0.27	0.70	0.21	1.50	1.70	4.69	
Mar-12	700	0	0.000%	70%	0.00	0.00	0.0		500	1	2.794%	70%	0.02	0.00	0.3	37,350	30	2.94%	70%	0.62	0.11	0.1	2,100	190	0.92%	70%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.21	0.70	0.42	0.0	1.1	0.3	0.31	0.81	0.25	1.63	1.82	4.87	
Apr-12	700	0	0.000%	175%	0.00	0.00	0.0		500	1	2.794%	175%	0.06	0.01	0.7	37,350	30	2.94%	175%	1.54	0.27	0.2	2,100	190	0.92%	175%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.25	0.81	0.59	1.0	0.4	0.1	0.11	0.30	0.09	0.94	1.16	3.79	
May-12	700	0	0.000%	170%	0.00	0.00	0.0		500	1	2.794%	170%	0.06	0.01	0.6	37,350	30	2.94%	170%	1.50	0.27	0.2	2,100	190	0.92%	170%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.09	0.30	0.59	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-12	700	0	0.000%	150%	0.00	0.00	0.0		500	1	2.794%	150%	0.05	0.01	0.6	37,350	30	2.94%	150%	1.32	0.23	0.2	2,100	190	0.92%	150%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.00	0.00	0.55	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-12	700	0	0.000%	40%	0.00	0.00	0.0		500	1	2.794%	40%	0.01	0.00	0.2	37,350	30	2.94%	40%	0.35	0.06	0.1	2,100	190	0.92%	40%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.00	0.00	0.38	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-12	700	0	0.000%	60%	0.00	0.00	0.0		500	1	2.794%	60%	0.02	0.00	0.2	37,350	30	2.94%	60%	0.53	0.09	0.1	2,100	190	0.92%	60%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.00	0.00	0.41	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-12	700	0	0.000%	150%	0.00	0.00	0.0		500	1	2.794%	150%	0.05	0.01	0.6	37,350	30	2.94%	150%	1.32	0.23	0.2	2,100	190	0.92%	150%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.00	0.00	0.55	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-12	700	0	0.000%	75%	0.00	0.00	0.0		500	1	2.794%	75%	0.02	0.00	0.3	37,350	30	2.94%	75%	0.66	0.12	0.1	2,100	190	0.92%	75%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.00	0.00	0.43	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-12	700	0	0.000%	75%	0.00	0.00	0.0		500	1	2.794%	75%	0.02	0.00	0.3	37,350	30	2.94%	75%	0.66	0.12	0.1	2,100	190	0.92%	75%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.00	0.00	0.43	0.0	0.4	0.1	0.12	0.31	0.10	0.97	1.19	3.85	
Dec-12	700	0	0.000%	100%	0.00	0.00	0.0		500	1	2.794%	100%	0.03	0.01	0.4	37,350	30	2.94%	100%	0.88	0.16	0.1	2,100	190	0.92%	100%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.10	0.31	0.47	0.0	0.8	0.2	0.22	0.57	0.18	1.34	1.55	4.46	
Jan-13	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	37,300	17	2.94%	60%	0.29	0.05	0.0	4,500	376	1.60%	60%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.18	0.57	1.12	0.0	1.7	0.4	0.48	1.20	0.37	2.03	2.17	5.36	
Feb-13	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	37,300	17	2.94%	75%	0.37	0.07	0.1	4,500	376	1.60%	75%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.37	1.20	1.13	0.0	2.3	0.5	0.67	1.66	0.51	2.42	2.51	5.81	
Mar-13	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	37,300	17	2.94%	70%	0.34	0.06	0.1	4,500	376	1.60%	70%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.51	1.66	1.12	0.0	2.8	0.6	0.80	1.99	0.61	2.67	2.72	6.07	
Apr-13	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	37,300	17	2.94%	175%	0.86	0.15	0.1	4,500	376	1.60%	175%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.61	1.99	1.22	1.0	2.2	0.5	0.63	1.57	0.48	2.35	2.45	5.73	
May-13	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	37,300	17	2.94%	170%	0.83	0.15	0.1	4,500	376	1.60%	170%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.48	1.57	1.21	2.0	0.8	0.2	0.22	0.56	0.17	1.33	1.54	4.44	
Jun-13	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	37,300	17	2.94%	150%	0.74	0.13	0.1	4,500	376	1.60%	150%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.17	0.56	1.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-13	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	37,300	17	2.94%	40%	0.20	0.03	0.0	4,500	376	1.60%	40%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.00	0.00	1.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-13	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	37,300	17	2.94%	60%	0.29	0.05	0.0	4,500	376	1.60%	60%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.00	0.00	1.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-13	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	37,300	17	2.94%	150%	0.74	0.13	0.1	4,500	376	1.60%	150%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.00	0.00	1.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-13	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	37,300	17	2.94%	75%	0.37	0.07	0.1	4,500	376	1.60%	75%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.00	0.00	1.13	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-13	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	37,300	17	2.94%	75%	0.37	0.07	0.1	4,500	376	1.60%	75%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.00	0.00	1.13	0.0	1.1	0.2	0.32	0.81	0.25	1.62	1.81	4.86	
Dec-13	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	37,300	17	2.94%	100%	0.49	0.09	0.1	4,500	376	1.60%	100%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.25	0.81	1.15	0.0	2.0	0.4	0.56	1.39	0.43	2.20	2.32	5.56	
Jan-14	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,950	21	2.94%	60%	0.37	0.07	0.1	7,200	468	1.98%	60%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.43	1.39	1.70	0.0	3.1	0.7	0.95	2.15	0.66	2.79	2.82	6.19	
Feb-14	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,950	21	2.94%	75%	0.46	0.08	0.1	7,200	468	1.98%	75%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.66	2.15	1.72	0.0	3.9	0.8	1.19	2.68	0.82	3.15	3.12	6.54	
Mar-14	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	38,950	21	2.94%	70%	0.43	0.08	0.1	7,200	468	1.98%	70%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.82	2.68	1.72	0.0	4.4	0.9	1.35	3.05	0.94	3.38	3.30	6.75	
Apr-14	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	38,950	21	2.94%	175%	1.07	0.19	0.2	7,200	468	1.98%	175%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.94	3.05	1.83	1.0	3.9	0.8	1.19	2.69	0.83	3.15	3.12	6.54	
May-14	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	38,950	21	2.94%	170%	1.04	0.18	0.2	7,200	468	1.98%	170%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.83	2.69	1.82	2.0	2.5	0.5	0.77	1.74	0.54	2.48	2.57	5.88	
Jun-14	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,950	21	2.94%	150%	0.92	0.16	0.1	7,200	468	1.98%	150%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.54	1.74	1.80	3.0	0.5	0.1	0.17	0.38	0.12	1.07	1.29	4.02	
Jul-14	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	38,950	21	2.94%	40%	0.25	0.04	0.0	7,200	468	1.98%	40%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.12	0.38	1.68	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-14	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,950	21	2.94%	60%	0.37	0.07	0.1	7,200	468	1.98%	60%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.00	0.00	1.70	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-14	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,950	21	2.94%	150%	0.92	0.16	0.1	7,200	468	1.98%	150%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.00	0.00	1.80	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-14	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,950	21	2.94%	75%	0.46	0.08	0.1	7,200	468	1.98%	75%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.00	0.00	1.72	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-14	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,950	21	2.94%	75%	0.46	0.08	0.1	7,200	468	1.98%	75%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.00	0.00	1.72	0.0	1.7	0.4	0.53	1.19	0.37	2.02	2.17	5.35	
Dec-14	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	38,950	21	2.94%	100%	0.61	0.11	0.1	7,200	468	1.98%	100%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.37	1.19	1.75	0.0	2.9	0.6	0.90	2.04	0.63	2.71	2.76	6.11	
Jan-15	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	40,600	28	2.94%	60%	0.50	0.09	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.63	2.04	0.09	0.0	2.1	0.5	0.60	1.53	0.47	2.31	2.42	5.69	
Feb-15	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	40,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.47	1.53	0.11	0.0	1.6	0.4	0.46	1.18	0.36	2.00	2.15	5.34	
Mar-15	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	40,600	28	2.94%	70%	0.58	0.10	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.36	1.18	0.10	0.0	1.3	0.3	0.36	0.92	0.28	1.75	1.93	5.02	
Apr-15	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	40,600	28	2.94%	175%	1.46	0.26	0.2	0	0	0.00%	175%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.28	0.92	0.26	1.0	0.2	0.0	0.05	0.13	0.04	0.59	0.80	3.09	
May-15	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	40,600	28	2.94%	170%	1.42	0.25	0.2	0	0	0.00%	170%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.04	0.13	0.25	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-15	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	40,600	28	2.94%	150%	1.25	0.22	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.00	0.00	0.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-15	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	40,600	28	2.94%	40%	0.33	0.06	0.0	0	0	0.00%	40%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-15	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	40,600	28	2.94%	60%	0.50	0.09	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.00	0.00	0.09	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-15	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	40,600	28	2.94%	150%	1.25	0.22	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.00	0.00	0.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-15	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	40,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.00	0.00	0.11	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-15	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	40,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.00	0.00	0.11	0.0	0.1	0.0	0.03	0.08	0.02	0.45	0.64	2.74	
Dec-15	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	40,600	28	2.94%	100%	0.83	0.15	0.1	0	0	0.00%	100%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.02	0.08	0.15	0.0	0.2	0.1	0.05	0.16	0.05	0.68	0.89	3.27	
Jan-16	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	40,000	31	2.94%	60%	0.54	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.05	0.16	0.10	0.0	0.3	0.1	0.07	0.19	0.06	0.73	0.94	3.39	
Feb-16	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	40,000	31	2.94%	75%	0.68	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.06	0.19	0.12	0.0	0.3	0.1	0.09	0.22	0.07	0.80	1.02	3.53	
Mar-16	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	40,000	31	2.94%	70%	0.63	0.11	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.07	0.22	0.11	0.0	0.3	0.1	0.09	0.24	0.07	0.84	1.06	3.61	

WLWB Ammonia Model - Increase North Inlet Case

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Apr-16	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	40,000	31	2.94%	175%	1.59	0.28	0.2	0	0	0.00%	175%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.07	0.24	0.28	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-16	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	40,000	31	2.94%	170%	1.54	0.27	0.2	0	0	0.00%	170%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.00	0.00	0.27	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-16	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	40,000	31	2.94%	150%	1.36	0.24	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.00	0.00	0.24	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-16	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	40,000	31	2.94%	40%	0.36	0.06	0.1	0	0	0.00%	40%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-16	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	40,000	31	2.94%	60%	0.54	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.00	0.00	0.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-16	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	40,000	31	2.94%	150%	1.36	0.24	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.00	0.00	0.24	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-16	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	40,000	31	2.94%	75%	0.68	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.00	0.00	0.12	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-16	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	40,000	31	2.94%	75%	0.68	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.00	0.00	0.12	0.0	0.1	0.0	0.03	0.09	0.03	0.46	0.67	2.80	
Dec-16	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	40,000	31	2.94%	100%	0.91	0.16	0.1	0	0	0.00%	100%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.03	0.09	0.16	0.0	0.2	0.1	0.07	0.18	0.05	0.71	0.92	3.35	
Jan-17	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	39,500	38	2.94%	60%	0.66	0.12	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.05	0.18	0.12	0.0	0.3	0.1	0.08	0.21	0.07	0.78	1.00	3.50	
Feb-17	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	39,500	38	2.94%	75%	0.83	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.07	0.21	0.15	0.0	0.4	0.1	0.10	0.26	0.08	0.87	1.09	3.68	
Mar-17	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	39,500	38	2.94%	70%	0.77	0.14	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.08	0.26	0.14	0.0	0.4	0.1	0.11	0.29	0.09	0.92	1.14	3.77	
Apr-17	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	39,500	38	2.94%	175%	1.93	0.34	0.3	0	0	0.00%	175%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.09	0.29	0.34	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-17	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	39,500	38	2.94%	170%	1.87	0.33	0.3	0	0	0.00%	170%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.33	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-17	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	39,500	38	2.94%	150%	1.65	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-17	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	39,500	38	2.94%	40%	0.44	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-17	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	39,500	38	2.94%	60%	0.66	0.12	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-17	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	39,500	38	2.94%	150%	1.65	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-17	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	39,500	38	2.94%	75%	0.83	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.15	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-17	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	39,500	38	2.94%	75%	0.83	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.15	0.0	0.1	0.0	0.04	0.11	0.03	0.53	0.73	2.94	
Dec-17	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	39,500	38	2.94%	100%	1.10	0.20	0.2	0	0	0.00%	100%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.03	0.11	0.20	0.0	0.3	0.1	0.08	0.22	0.07	0.79	1.01	3.52	
Jan-18	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	39,000	37	2.94%	60%	0.65	0.11	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.07	0.22	0.11	0.0	0.3	0.1	0.09	0.24	0.07	0.84	1.06	3.61	
Feb-18	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	39,000	37	2.94%	75%	0.81	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.07	0.24	0.14	0.0	0.4	0.1	0.11	0.28	0.09	0.91	1.13	3.74	
Mar-18	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	39,000	37	2.94%	70%	0.75	0.13	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.09	0.28	0.13	0.0	0.4	0.1	0.11	0.30	0.09	0.94	1.16	3.81	
Apr-18	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	39,000	37	2.94%	175%	1.89	0.33	0.3	0	0	0.00%	175%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.09	0.30	0.33	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-18	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	39,000	37	2.94%	170%	1.83	0.32	0.3	0	0	0.00%	170%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.32	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-18	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	39,000	37	2.94%	150%	1.62	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-18	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	39,000	37	2.94%	40%	0.43	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-18	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	39,000	37	2.94%	60%	0.65	0.11	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.11	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-18	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	39,000	37	2.94%	150%	1.62	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-18	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	39,000	37	2.94%	75%	0.81	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.14	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-18	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	39,000	37	2.94%	75%	0.81	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.14	0.0	0.1	0.0	0.04	0.10	0.03	0.53	0.72	2.93	
Dec-18	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	39,000	37	2.94%	100%	1.08	0.19	0.2	0	0	0.00%	100%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.03	0.10	0.19	0.0	0.3	0.1	0.08	0.21	0.07	0.78	1.00	3.50	
Jan-19	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,500	33	2.94%	60%	0.57	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.07	0.21	0.10	0.0	0.3	0.1	0.09	0.23	0.07	0.82	1.03	3.56	
Feb-19	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,500	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.07	0.23	0.13	0.0	0.4	0.1	0.10	0.26	0.08	0.87	1.09	3.67	
Mar-19	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	38,500	33	2.94%	70%	0.67	0.12	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.08	0.26	0.12	0.0	0.4	0.1	0.10	0.28	0.09	0.90	1.12	3.73	
Apr-19	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	38,500	33	2.94%	175%	1.67	0.30	0.3	0	0	0.00%	175%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.09	0.28	0.30	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-19	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	38,500	33	2.94%	170%	1.62	0.29	0.2	0	0	0.00%	170%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.29	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-19	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,500	33	2.94%	150%	1.43	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-19	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	38,500	33	2.94%	40%	0.38	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.07	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-19	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,500	33	2.94%	60%	0.57	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-19	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,500	33	2.94%	150%	1.43	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-19	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,500	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.13	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-19	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,500	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.13	0.0	0.1	0.0	0.03	0.09	0.03	0.49	0.69	2.84	
Dec-19	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	38,500	33	2.94%	100%	0.96	0.17	0.1	0	0	0.00%	100%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.03	0.09	0.17	0.0	0.3	0.1	0.07	0.19	0.06	0.74	0.95	3.40	
Jan-20	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	42,600	38	2.94%	60%	0.68	0.12	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.06	0.19	0.12	0.0	0.3	0.1	0.09	0.22	0.07	0.80	1.01	3.52	
Feb-20	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	42,600	38	2.94%	75%	0.85	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.07	0.22	0.15	0.0	0.4	0.1	0.11	0.26	0.09	0.88	1.10	3.68	
Mar-20	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	42,600	38	2.94%	70%	0.79	0.14	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.08	0.26	0.14	0.0	0.4	0.1	0.12	0.29	0.09	0.92	1.14	3.76	
Apr-20	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	42,600	38	2.94%	175%	1.97	0.35	0.3	0	0	0.00%	175%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.09	0.29	0.35	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-20	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	42,600	38	2.94%	170%	1.92	0.34	0.3	0	0	0.00%	170%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.00	0.00	0.34	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-20	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	42,600	38	2.94%	150%	1.69	0.30	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.00	0.00	0.30	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-20	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	42,600	38	2.94%	40%	0.45	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-20	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	42,600	38	2.94%	60%	0.68	0.12	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.00	0.00	0.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Increase North Inlet Case

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Sep-20	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	42,600	38	2.94%	150%	1.69	0.30	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.00	0.00	0.30	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-20	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	42,600	38	2.94%	75%	0.85	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.00	0.00	0.15	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-20	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	42,600	38	2.94%	75%	0.85	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.00	0.00	0.15	0.0	0.1	0.0	0.04	0.11	0.03	0.53	0.73	2.94	
Dec-20	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	42,600	38	2.94%	100%	1.13	0.20	0.2	0	0	0.00%	100%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.03	0.11	0.20	0.0	0.3	0.1	0.09	0.22	0.07	0.79	1.01	3.51	
Jan-21	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	46,800	40	2.94%	60%	0.71	0.13	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.07	0.22	0.13	0.0	0.3	0.1	0.11	0.24	0.07	0.83	1.04	3.59	
Feb-21	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	46,800	40	2.94%	75%	0.88	0.16	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.07	0.24	0.16	0.0	0.4	0.1	0.12	0.27	0.08	0.89	1.11	3.71	
Mar-21	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	46,800	40	2.94%	70%	0.82	0.15	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.08	0.27	0.15	0.0	0.4	0.1	0.13	0.29	0.09	0.92	1.14	3.76	
Apr-21	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	46,800	40	2.94%	175%	2.06	0.36	0.3	0	0	0.00%	175%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.09	0.29	0.36	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-21	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	46,800	40	2.94%	170%	2.00	0.35	0.2	0	0	0.00%	170%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.00	0.00	0.35	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-21	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	46,800	40	2.94%	150%	1.76	0.31	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.00	0.00	0.31	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-21	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	46,800	40	2.94%	40%	0.47	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-21	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	46,800	40	2.94%	60%	0.71	0.13	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.00	0.00	0.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-21	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	46,800	40	2.94%	150%	1.76	0.31	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.00	0.00	0.31	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-21	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	46,800	40	2.94%	75%	0.88	0.16	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.00	0.00	0.16	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-21	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	46,800	40	2.94%	75%	0.88	0.16	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.00	0.00	0.16	0.0	0.2	0.0	0.05	0.11	0.03	0.54	0.73	2.95	
Dec-21	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	46,800	40	2.94%	100%	1.18	0.21	0.1	0	0	0.00%	100%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.03	0.11	0.21	0.0	0.3	0.1	0.10	0.22	0.07	0.79	1.01	3.52	
Jan-22	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	42,200	32	2.94%	60%	0.56	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.07	0.22	0.10	0.0	0.3	0.1	0.09	0.23	0.07	0.81	1.02	3.55	
Feb-22	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	42,200	32	2.94%	75%	0.70	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.07	0.23	0.12	0.0	0.3	0.1	0.10	0.25	0.08	0.85	1.07	3.63	
Mar-22	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	42,200	32	2.94%	70%	0.65	0.12	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.08	0.25	0.12	0.0	0.4	0.1	0.11	0.26	0.08	0.87	1.09	3.67	
Apr-22	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	42,200	32	2.94%	175%	1.63	0.29	0.2	0	0	0.00%	175%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.08	0.26	0.29	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-22	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	42,200	32	2.94%	170%	1.58	0.28	0.2	0	0	0.00%	170%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.00	0.00	0.28	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-22	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	42,200	32	2.94%	150%	1.40	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-22	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	42,200	32	2.94%	40%	0.37	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.00	0.00	0.07	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-22	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	42,200	32	2.94%	60%	0.56	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.00	0.00	0.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-22	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	42,200	32	2.94%	150%	1.40	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-22	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	42,200	32	2.94%	75%	0.70	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.00	0.00	0.12	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-22	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	42,200	32	2.94%	75%	0.70	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.00	0.00	0.12	0.0	0.1	0.0	0.04	0.09	0.03	0.48	0.67	2.81	
Dec-22	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	42,200	32	2.94%	100%	0.93	0.16	0.1	0	0	0.00%	100%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.03	0.09	0.16	0.0	0.3	0.1	0.07	0.18	0.06	0.71	0.92	3.35	
Jan-23	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	37,700	35	2.94%	60%	0.62	0.11	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.06	0.18	0.11	0.0	0.3	0.1	0.08	0.21	0.07	0.78	1.00	3.49	
Feb-23	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	37,700	35	2.94%	75%	0.77	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.07	0.21	0.14	0.0	0.3	0.1	0.09	0.26	0.08	0.86	1.08	3.66	
Mar-23	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	37,700	35	2.94%	70%	0.72	0.13	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.08	0.26	0.13	0.0	0.4	0.1	0.10	0.28	0.09	0.91	1.13	3.74	
Apr-23	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	37,700	35	2.94%	175%	1.80	0.32	0.3	0	0	0.00%	175%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.09	0.28	0.32	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-23	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	37,700	35	2.94%	170%	1.75	0.31	0.3	0	0	0.00%	170%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.00	0.00	0.31	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-23	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	37,700	35	2.94%	150%	1.54	0.27	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.00	0.00	0.27	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-23	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	37,700	35	2.94%	40%	0.41	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.00	0.00	0.07	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-23	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	37,700	35	2.94%	60%	0.62	0.11	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.00	0.00	0.11	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-23	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	37,700	35	2.94%	150%	1.54	0.27	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.00	0.00	0.27	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-23	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	37,700	35	2.94%	75%	0.77	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.00	0.00	0.14	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-23	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	37,700	35	2.94%	75%	0.77	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.00	0.00	0.14	0.0	0.1	0.0	0.04	0.10	0.03	0.52	0.71	2.90	
Dec-23	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	37,700	35	2.94%	100%	1.03	0.18	0.2	0	0	0.00%	100%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.03	0.10	0.18	0.0	0.3	0.1	0.08	0.21	0.06	0.77	0.99	3.47	
Jan-24	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,300	10	2.94%	60%	0.18	0.03	0.0	0	0	0.00%	60%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.06	0.21	0.03	0.0	0.2	0.1	0.06	0.17	0.05	0.70	0.91	3.32	
Feb-24	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,300	10	2.94%	75%	0.22	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.05	0.17	0.04	0.0	0.2	0.0	0.06	0.16	0.05	0.66	0.87	3.23	
Mar-24	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	38,300	10	2.94%	70%	0.21	0.04	0.0	0	0	0.00%	70%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.05	0.16	0.04	0.0	0.2	0.0	0.05	0.14	0.04	0.62	0.83	3.15	
Apr-24	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	38,300	10	2.94%	175%	0.51	0.09	0.1	0	0	0.00%	175%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.04	0.14	0.09	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-24	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	38,300	10	2.94%	170%	0.50	0.09	0.1	0	0	0.00%	170%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.00	0.00	0.09	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-24	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,300	10	2.94%	150%	0.44	0.08	0.1	0	0	0.00%	150%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-24	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	38,300	10	2.94%	40%	0.12	0.02	0.0	0	0	0.00%	40%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.00	0.00	0.02	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-24	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,300	10	2.94%	60%	0.18	0.03	0.0	0	0	0.00%	60%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.00	0.00	0.03	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-24	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,300	10	2.94%	150%	0.44	0.08	0.1	0	0	0.00%	150%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-24	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,300	10	2.94%	75%	0.22	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.00	0.00	0.04	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-24	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,300	10	2.94%	75%	0.22	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.00	0.00	0.04	0.0	0.0	0.0	0.01	0.03	0.01	0.26	0.40	2.13	
Dec-24	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	38,300	10	2.94%	100%	0.29	0.05	0.0	0	0	0.00%	100%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.01	0.03	0.05	0.0	0.1	0.0	0.02	0.06	0.02	0.39	0.56	2.54	
Jan-25	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,900	0	2.94%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.02	0.06	0.00	0.0	0.1	0.0	0.02	0.04	0.01	0.32	0.48	2.35	

WLWB Ammonia Model - Increase North Inlet Case

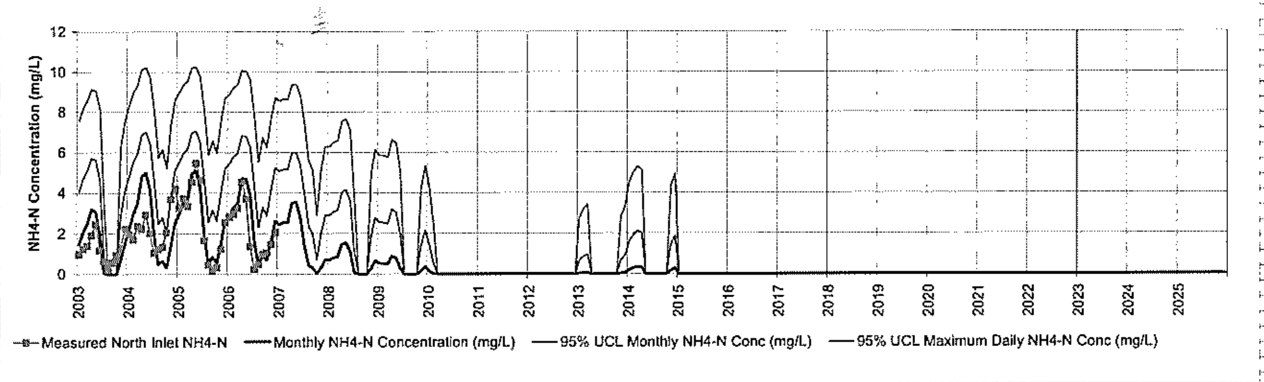
	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Feb-25	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,900	0	2.94%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.01	0.04	0.00	0.0	0.0	0.0	0.01	0.03	0.01	0.27	0.42	2.17	
Mar-25	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	38,900	0	2.94%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.01	0.03	0.00	0.0	0.0	0.0	0.01	0.02	0.01	0.23	0.36	2.01	
Apr-25	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	38,900	0	2.94%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.01	0.02	0.00	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-25	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	38,900	0	2.94%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.00	0.00	0.00	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-25	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,900	0	2.94%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-25	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	38,900	0	2.94%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-25	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,900	0	2.94%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-25	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,900	0	2.94%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-25	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,900	0	2.94%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.00	0.00	0.00	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-25	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,900	0	2.94%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-25	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	38,900	0	2.94%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Enhanced Natural Degradation in North Inlet

WLWB AMMONIA MANAGEMENT MODEL OF DIAVIK PROJECT

CASE:	**Enhanced Natural Degradation in Expanded North Inlet**
BLASTING:	Current practices: open hole; 65/35 emulsion/ANFO mix; no liner; wet holes pumped and double primed; large area blasts
AN USE:	Past and future use as per Diavik ADP projections (SNC-Lavalin, Ammonia Balance, May 2006)
MINE INFLOW:	Actual to present, predicted inflows (Golder, 2006) in future.
WATER MANAGEMENT:	All mine water discharged to North Inlet
TREATMENT:	Aeration of part of North Inlet resulting in an extension of Natural Degradation to 12 months of the year in addition to Enhanced Natural Degradation (150%) with cattail mats
FLOW TO LAC DE GRAS:	Actual to present, future discharge equal to input in same month.

RESULTS	**FROM BEGINNING OF**	03	07	08
AMMONIA (N) TO LDG	**TO END OF**	06	07	25
	Average	2.3	1.7	0.1
	Maximum 30 Day	5.1	3.5	1.6
	Maximum 1 Day	8.6	7.0	4.5
	Maximum 95% UCL 30 Day	7.1	6.0	4.2
	Maximum 95% UCL 1 Day	10.3	9.4	7.7



WLWB Ammonia Model - Enhanced Natural Degradation in North Inlet

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154						
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)
Jan-03	5,380	867	0.924%	60%	4.80	0.85	5.2	8.4	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0
Feb-03	5,667	867	0.924%	75%	6.00	1.06	6.2	7.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Mar-03	5,954	867	0.924%	70%	5.60	0.99	5.5	5.1	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0
Apr-03	6,251	867	0.924%	175%	14.01	2.48	13.0	10.5	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0
May-03	5,936	867	0.924%	170%	13.61	2.41	13.3	5.4	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0
Jun-03	7,290	867	0.924%	150%	12.01	2.13	9.6	3.2	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0
Jul-03	6,867	867	0.924%	40%	3.20	0.57	2.7	6.7	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0
Aug-03	7,753	867	0.924%	60%	4.80	0.85	3.6	6.1	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0
Sep-03	8,194	867	0.924%	150%	12.01	2.13	6.5	8.4	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0
Oct-03	8,775	867	0.924%	75%	6.00	1.06	4.0	6.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Nov-03	8,935	867	0.924%	75%	6.00	1.06	3.9	6.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Dec-03	8,301	867	0.924%	100%	8.01	1.42	5.6	5.1	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0
Jan-04	8,570	808	1.598%	60%	7.75	1.37	5.3	4.3	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0
Feb-04	7,982	808	1.598%	75%	9.69	1.72	7.1	5.9	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Mar-04	8,828	808	1.598%	70%	9.04	1.60	6.0	6.0	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0
Apr-04	9,324	808	1.598%	175%	22.60	4.00	14.1	5.3	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0
May-04	10,755	808	1.598%	170%	21.95	3.89	11.9	9.3	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0
Jun-04	12,337	808	1.598%	150%	19.37	3.43	9.1	5.3	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0
Jul-04	11,098	808	1.598%	40%	5.17	0.92	2.7	13.4	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0
Aug-04	11,394	808	1.598%	60%	7.75	1.37	4.0	8.9	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0
Sep-04	12,030	808	1.598%	150%	19.37	3.43	9.4	6.7	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0
Oct-04	11,948	808	1.598%	75%	9.69	1.72	4.7	6.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Nov-04	11,300	808	1.598%	75%	9.69	1.72	5.0	7.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Dec-04	10,514	808	1.598%	100%	12.91	2.29	7.2	5.1	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0
Jan-05	10,958	725	1.979%	60%	8.61	1.53	4.6	4.5	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0
Feb-05	11,359	725	1.979%	75%	10.76	1.91	5.5	4.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Mar-05	12,270	725	1.979%	70%	10.04	1.78	4.8	5.8	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0
Apr-05	13,110	725	1.979%	175%	25.11	4.45	11.2	11.5	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0
May-05	14,120	725	1.979%	170%	24.39	4.32	10.1	11.7	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0
Jun-05	15,045	725	1.979%	150%	21.52	3.81	8.3	10.7	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0
Jul-05	15,261	725	1.979%	40%	5.74	1.02	2.2	5.1	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0
Aug-05	14,863	725	1.979%	60%	8.61	1.53	3.4	3.3	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0
Sep-05	15,820	725	1.979%	150%	21.52	3.81	7.9	2.2	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0
Oct-05	15,681	725	1.979%	75%	10.76	1.91	4.0	2.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Nov-05	15,693	725	1.979%	75%	10.76	1.91	4.0	3.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Dec-05	14,884	725	1.979%	100%	14.35	2.54	5.6	6.3	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0
Jan-06	15,584	642	2.256%	60%	8.69	1.54	3.2	3.7	250	0	0.000%	60%	0.00	0.00	0.0	0	46	2.94%	60%	0.81	0.14	#DIV/0!
Feb-06	15,104	642	2.256%	75%	10.86	1.92	4.2	4.8	250	0	0.000%	75%	0.00	0.00	0.0	0	46	2.94%	75%	1.01	0.18	#DIV/0!
Mar-06	15,618	642	2.256%	70%	10.14	1.80	3.8	3.1	250	0	0.000%	70%	0.00	0.00	0.0	0	46	2.94%	70%	0.94	0.17	#DIV/0!
Apr-06	16,453	642	2.256%	175%	25.34	4.49	9.0	9.6	250	0	0.000%	175%	0.00	0.00	0.0	0	46	2.94%	175%	2.35	0.42	#DIV/0!
May-06	19,475	642	2.256%	170%	24.61	4.36	7.4	5.3	250	0	0.000%	170%	0.00	0.00	0.0	0	46	2.94%	170%	2.28	0.40	#DIV/0!
Jun-06	18,310	642	2.256%	150%	21.72	3.85	6.9	3.4	250	0	0.000%	150%	0.00	0.00	0.0	22	46	2.94%	150%	2.01	0.36	531.3
Jul-06	17,677	642	2.256%	40%	5.79	1.03	1.9	4.4	250	0	0.000%	40%	0.00	0.00	0.0	40	46	2.94%	40%	0.54	0.10	77.3
Aug-06	18,560	642	2.256%	60%	8.69	1.54	2.7	7.3	250	0	0.000%	60%	0.00	0.00	0.0	38	46	2.94%	60%	0.81	0.14	122.6
Sep-06	19,176	642	2.256%	150%	21.72	3.85	6.6	5.4	250	0	0.000%	150%	0.00	0.00	0.0	154	46	2.94%	150%	2.01	0.36	76.1
Oct-06	18,487	642	2.256%	75%	10.86	1.92	3.4	3.7	250	0	0.000%	75%	0.00	0.00	0.0	430	46	2.94%	75%	1.01	0.18	13.6
Nov-06	19,635	642	2.256%	75%	10.86	1.92	3.2	2.4	250	0	0.000%	75%	0.00	0.00	0.0	687	46	2.94%	75%	1.01	0.18	8.5
Dec-06	17,652	642	2.256%	100%	14.48	2.57	4.8	4.5	250	0	0.000%	100%	0.00	0.00	0.0	929	46	2.94%	100%	1.34	0.24	8.4
Jan-07	17,200	408	2.794%	60%	6.84	1.21	2.3		500	400	0.924%	60%	2.22	0.39	25.8	8,200	33	2.94%	60%	0.57	0.10	0.4
Feb-07	17,200	408	2.794%	75%	8.56	1.52	2.9		500	400	0.924%	75%	2.77	0.49	32.3	8,200	33	2.94%	75%	0.72	0.13	0.5
Mar-07	17,200	408	2.794%	70%	7.99	1.42	2.7		500	400	0.924%	70%	2.59	0.46	30.1	8,200	33	2.94%	70%	0.67	0.12	0.5
Apr-07	17,200	408	2.794%	175%	19.96	3.54	6.8		500	400	0.924%	175%	6.47	1.15	75.3	8,200	33	2.94%	175%	1.67	0.30	1.2
May-07	17,200	408	2.794%	170%	19.39	3.44	6.6		500	400	0.924%	170%	6.28	1.11	73.1	8,200	33	2.94%	170%	1.62	0.29	1.2

	SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Jan-03	0	0	0.00%	60%	0.00	0.00	0.0	1.25	5380	1.41	32000	17,905	1.00	1.25	0.85	0.0	2.1	1.5	0.81	1.29	1.49	4.35	4.06	7.57	1.0
Feb-03	0	0	0.00%	75%	0.00	0.00	0.0	1.25	5667	1.42	32000	17,175	1.49	1.86	1.06	0.0	2.9	2.1	1.07	1.85	2.05	5.20	4.70	8.20	1.3
Mar-03	0	0	0.00%	70%	0.00	0.00	0.0	1.25	5954	1.43	32000	16,854	2.05	2.57	0.99	0.0	3.6	2.5	1.28	2.29	2.49	5.78	5.12	8.60	1.4
Apr-03	0	0	0.00%	175%	0.00	0.00	0.0	1.25	6251	1.44	32000	16,875	2.49	3.11	2.48	1.0	4.6	3.2	1.64	2.96	3.19	6.62	5.73	9.14	1.9
May-03	0	0	0.00%	170%	0.00	0.00	0.0	1.25	5936	1.43	32000	25,514	3.19	3.99	2.41	2.0	4.4	3.1	2.39	2.01	3.07	6.49	5.64	9.06	2.5
Jun-03	0	0	0.00%	150%	0.00	0.00	0.0	1.25	7290	1.47	32000	29,485	3.07	3.84	2.13	3.0	3.0	2.0	1.81	1.16	2.02	5.15	4.66	8.16	1.2
Jul-03	0	0	0.00%	40%	0.00	0.00	0.0	1.25	6867	1.46	32000	28,379	2.02	2.52	0.57	3.0	0.1	0.1	0.05	0.04	0.06	0.76	0.98	3.45	0.6
Aug-03	0	0	0.00%	60%	0.00	0.00	0.0	1.25	7753	1.49	32000	27,136	0.06	0.08	0.85	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.2
Sep-03	0	0	0.00%	150%	0.00	0.00	0.0	1.25	8194	1.50	32000	29,865	0.00	0.00	2.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.6
Oct-03	0	0	0.00%	75%	0.00	0.00	0.0	1.25	8775	1.52	32000	27,977	0.00	0.00	1.06	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.9
Nov-03	0	0	0.00%	75%	0.00	0.00	0.0	1.25	8935	1.52	32000	15,411	0.00	0.00	1.06	0.0	1.1	0.7	0.33	0.74	0.70	2.87	2.89	6.28	1.3
Dec-03	0	0	0.00%	100%	0.00	0.00	0.0	1.25	8301	1.50	32000	24,385	0.70	0.87	1.42	0.0	2.3	1.5	1.13	1.16	1.53	4.42	4.11	7.62	2.2
Jan-04	0	0	0.00%	60%	0.00	0.00	0.0	1.25	8570	1.51	32000	13,372	1.53	1.91	1.37	0.0	3.3	2.2	0.88	2.40	2.17	5.36	4.82	8.31	2.0
Feb-04	0	0	0.00%	75%	0.00	0.00	0.0	1.25	7982	1.49	32000	7,407	2.17	2.71	1.72	0.0	4.4	3.0	0.67	3.76	2.97	6.37	5.55	8.98	1.7
Mar-04	0	0	0.00%	70%	0.00	0.00	0.0	1.25	8828	1.52	32000	3,826	2.97	3.71	1.60	0.0	5.3	3.5	0.41	4.91	3.50	6.97	5.97	9.35	2.4
Apr-04	0	0	0.00%	175%	0.00	0.00	0.0	1.25	9324	1.53	32000	0	3.50	4.37	4.00	1.0	7.4	4.8	0.00	7.38	4.81	8.30	6.89	10.12	2.2
May-04	0	0	0.00%	170%	0.00	0.00	0.0	1.25	10755	1.58	32000	0	4.81	6.01	3.89	2.0	7.9	5.0	0.00	7.90	5.01	8.49	7.02	10.22	2.9
Jun-04	0	0	0.00%	150%	0.00	0.00	0.0	1.25	12337	1.63	32000	16,027	5.01	6.26	3.43	3.0	6.7	4.1	2.01	4.69	4.12	7.63	6.43	9.74	2.0
Jul-04	0	0	0.00%	40%	0.00	0.00	0.0	1.25	11098	1.59	32000	25,310	4.12	5.15	0.92	3.0	3.1	1.9	1.49	1.58	1.93	5.03	4.57	8.07	1.1
Aug-04	0	0	0.00%	60%	0.00	0.00	0.0	1.25	11394	1.60	32000	28,658	1.93	2.41	1.37	3.0	0.8	0.5	0.43	0.36	0.49	2.37	2.47	5.76	1.2
Sep-04	0	0	0.00%	150%	0.00	0.00	0.0	1.25	12030	1.62	32000	27,577	0.49	0.62	3.43	3.0	1.0	0.6	0.54	0.50	0.65	2.76	2.80	6.17	1.3
Oct-04	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11948	1.61	32000	13,563	0.65	0.81	1.72	2.0	0.5	0.3	0.14	0.39	0.33	1.89	2.06	5.20	2.1
Nov-04	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11300	1.59	32000	12,590	0.33	0.41	1.72	0.0	2.1	1.3	0.51	1.61	1.33	4.10	3.87	7.37	3.7
Dec-04	0	0	0.00%	100%	0.00	0.00	0.0	1.25	10514	1.57	32000	11,561	1.33	1.67	2.29	0.0	4.0	2.5	0.89	3.07	2.52	5.82	5.15	8.62	4.2
Jan-05	0	0	0.00%	60%	0.00	0.00	0.0	1.25	10958	1.58	32000	10,692	2.52	3.15	1.53	0.0	4.7	3.0	0.96	3.72	2.95	6.35	5.53	8.97	3.3
Feb-05	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11359	1.60	32000	12,385	2.95	3.69	1.91	0.0	5.6	3.5	1.32	4.26	3.51	6.98	5.98	9.36	3.7
Mar-05	0	0	0.00%	70%	0.00	0.00	0.0	1.25	12270	1.62	32000	12,748	3.51	4.39	1.78	0.0	6.2	3.8	1.47	4.69	3.80	7.29	6.20	9.55	3.4
Apr-05	0	0	0.00%	175%	0.00	0.00	0.0	1.25	13110	1.65	32000	13,667	3.80	4.75	4.45	1.0	8.2	5.0	2.07	6.13	4.97	8.46	7.00	10.20	4.6
May-05	0	0	0.00%	170%	0.00	0.00	0.0	1.25	14120	1.68	32000	16,000	4.97	6.22	4.32	2.0	8.5	5.1	2.47	6.06	5.08	8.56	7.07	10.26	5.5
Jun-05	0	0	0.00%	150%	0.00	0.00	0.0	1.25	15045	1.71	32000	17,531	5.08	6.35	3.81	3.0	7.2	4.2	2.24	4.93	4.20	7.70	6.48	9.79	4.6
Jul-05	0	0	0.00%	40%	0.00	0.00	0.0	1.25	15261	1.71	32000	8,477	4.20	5.25	1.02	3.0	3.3	1.9	0.49	2.77	1.90	4.99	4.54	8.05	1.7
Aug-05	0	0	0.00%	60%	0.00	0.00	0.0	1.25	14863	1.70	32000	17,738	1.90	2.38	1.53	3.0	0.9	0.5	0.29	0.62	0.53	2.48	2.56	5.87	0.5
Sep-05	0	0	0.00%	150%	0.00	0.00	0.0	1.25	15820	1.73	32000	24,395	0.53	0.67	3.81	3.0	1.5	0.9	0.63	0.85	0.86	3.21	3.17	6.60	0.2
Oct-05	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15681	1.73	32000	21,915	0.86	1.07	1.91	2.0	1.0	0.6	0.38	0.60	0.57	2.56	2.63	5.96	0.3
Nov-05	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15693	1.73	32000	17,253	0.57	0.71	1.91	0.0	2.6	1.5	0.79	1.82	1.51	4.40	4.10	7.60	1.2
Dec-05	0	0	0.00%	100%	0.00	0.00	0.0	1.25	14884	1.70	32000	14,961	1.51	1.89	2.54	0.0	4.4	2.6	1.19	3.25	2.60	5.92	5.23	8.69	2.6
Jan-06	0	0	0.00%	60%	0.00	0.00	0.0	1.25	15834	1.73	32000	15,041	2.60	3.26	1.68	0.0	4.9	2.9	1.30	3.63	2.85	6.23	5.45	8.89	2.8
Feb-06	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15354	1.72	32000	15,114	2.85	3.56	2.10	0.0	5.7	3.3	1.52	4.15	3.30	6.75	5.82	9.22	3.0
Mar-06	0	0	0.00%	70%	0.00	0.00	0.0	1.25	15868	1.73	32000	19,356	3.30	4.13	1.96	0.0	6.1	3.5	2.07	4.02	3.51	6.99	5.99	9.36	3.3
Apr-06	0	0	0.00%	175%	0.00	0.00	0.0	1.25	16703	1.76	32000	17,439	3.51	4.39	4.91	1.0	8.3	4.7	2.50	5.80	4.72	8.22	6.84	10.07	4.6
May-06	0	0	0.00%	170%	0.00	0.00	0.0	1.25	19725	1.85	32000	20,203	4.72	5.90	4.77	2.0	8.7	4.7	2.88	5.79	4.69	8.18	6.81	10.06	3.7
Jun-06	0	0	0.00%	150%	0.00	0.00	0.0	1.25	18582	1.82	32000	27,717	4.69	5.86	4.21	3.0	7.1	3.9	3.28	3.78	3.89	7.39	6.27	9.60	1.4
Jul-06	0	0	0.00%	40%	0.00	0.00	0.0	1.25	17967	1.80	32000	22,154	3.89	4.86	1.12	3.0	3.0	1.7	1.12	1.87	1.66	4.63	4.27	7.78	0.2
Aug-06	0	0	0.00%	60%	0.00	0.00	0.0	1.25	18849	1.82	32000	18,801	1.66	2.08	1.68	3.0	0.8	0.4	0.24	0.52	0.42	2.16	2.29	5.52	0.5
Sep-06	0	0	0.00%	150%	0.00	0.00	0.0	1.25	19580	1.85	32000	25,748	0.42	0.52	4.21	3.0	1.7	0.9	0.73	0.99	0.94	3.37	3.30	6.75	1.0
Oct-06	0	0	0.00%	75%	0.00	0.00	0.0	1.25	19166	1.83	32000	26,010	0.94	1.17	2.10	2.0	1.3	0.7	0.55	0.72	0.69	2.86	2.88	6.27	1.1
Nov-06	0	0	0.00%	75%	0.00	0.00	0.0	1.25	20572	1.88	32000	23,981	0.69	0.87	2.10	0.0	3.0	1.6	1.16	1.82	1.58	4.51	4.18	7.69	1.5
Dec-06	0	0	0.00%	100%	0.00	0.00	0.0	1.25	18831	1.82	32000	19,976	1.58	1.98	2.80	0.0	4.8	2.6	1.59	3.19	2.62	5.95	5.25	8.71	2.1
Jan-07	0	0	0.00%	60%	0.00	0.00	0.0	1.25	25900	2.04	32000	25,900	2.62	3.28	1.71	0.0	5.0	2.4	1.93	3.06	2.45	5.73	5.09	8.56	
Feb-07	0	0	0.00%	75%	0.00	0.00	0.0	1.25	25900	2.04	32000	25,900	2.45	3.06	2.13	0.0	5.2	2.5	2.01	3.19	2.55	5.86	5.18	8.65	
Mar-07	0	0	0.00%	70%	0.00	0.00	0.0	1.25	25900	2.04	32000	25,900	2.55	3.19	1.99	0.0	5.2	2.5	2.00	3.18	2.54	5.85	5.17	8.64	
Apr-07	0	0	0.00%	175%	0.00	0.00	0.0	1.25	25900	2.04	32000	25,900	2.54	3.18	4.98	1.0	7.2	3.5	2.77	4.39	3.51	6.98	5.98	9.36	
May-07	0	0	0.00%	170%	0.00	0.00	0.0	1.25	25900	2.04	45000	25,900	3.51	4.39	4.84	2.0	7.2	3.5	2.79	4.43	3.55	7.02	6.01	9.39	

WLWB Ammonia Model - Enhanced Natural Degradation in North Inlet

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Jun-07	17,200	408	2.794%	150%	17.11	3.03	5.8		500	400	0.924%	150%	5.54	0.98	64.5	8,200	33	2.94%	150%	1.43	0.25	1.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	25900	2.04	45000	25,900	3.55	4.43	4.27	3.0	5.7	2.8	2.20	3.50	2.80	6.16	5.40	8.85	
Jul-07	17,200	408	2.794%	40%	4.56	0.81	1.5		500	400	0.924%	40%	1.48	0.26	17.2	8,200	33	2.94%	40%	0.38	0.07	0.3	0	0	0.00%	40%	0.00	0.00	0.0	3.25	25900	4.04	45000	25,900	2.80	9.09	1.14	4.5	5.7	1.4	1.12	4.61	1.42	4.24	3.98	7.48	
Aug-07	17,200	408	2.794%	60%	6.84	1.21	2.3		500	400	0.924%	60%	2.22	0.39	25.8	8,200	33	2.94%	60%	0.57	0.10	0.4	0	0	0.00%	60%	0.00	0.00	0.0	3.25	25900	4.04	45000	25,900	1.42	4.61	1.71	4.5	1.8	0.5	0.36	1.47	0.45	2.26	2.38	5.63	
Sep-07	17,200	408	2.794%	150%	17.11	3.03	5.8		500	400	0.924%	150%	5.54	0.98	64.5	8,200	33	2.94%	150%	1.43	0.25	1.0	0	0	0.00%	150%	0.00	0.00	0.0	3.25	25900	4.04	45000	25,900	0.45	1.47	4.27	4.5	1.2	0.3	0.24	0.99	0.31	1.82	1.99	5.12	
Oct-07	17,200	408	2.794%	75%	8.56	1.52	2.9		500	400	0.924%	75%	2.77	0.49	32.3	8,200	33	2.94%	75%	0.72	0.13	0.5	0	0	0.00%	75%	0.00	0.00	0.0	3.25	25900	4.04	45000	25,900	0.31	0.99	2.13	3.0	0.1	0.0	0.02	0.10	0.03	0.52	0.72	2.92	
Nov-07	17,200	408	2.794%	75%	8.56	1.52	2.9		500	400	0.924%	75%	2.77	0.49	32.3	8,200	33	2.94%	75%	0.72	0.13	0.5	0	0	0.00%	75%	0.00	0.00	0.0	3.25	25900	4.04	45000	25,900	0.03	0.10	2.13	1.0	1.2	0.3	0.24	1.00	0.31	1.83	2.00	5.12	
Dec-07	17,200	408	2.794%	100%	11.41	2.02	3.9		500	400	0.924%	100%	3.69	0.65	43.0	8,200	33	2.94%	100%	0.96	0.17	0.7	0	0	0.00%	100%	0.00	0.00	0.0	3.25	25900	4.04	45000	25,900	0.31	1.00	2.85	1.0	2.8	0.7	0.55	2.29	0.70	2.88	2.90	6.29	
Jan-08	8,950	90	2.794%	60%	1.51	0.27	1.0		500	808	1.598%	60%	7.75	1.37	90.2	24,600	28	2.94%	60%	0.50	0.09	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	0.70	2.29	1.73	1.0	3.0	0.7	0.73	2.29	0.70	2.88	2.90	6.29	
Feb-08	8,950	90	2.794%	75%	1.89	0.33	1.2		500	808	1.598%	75%	9.69	1.72	112.8	24,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	0.70	2.29	2.16	1.0	3.4	0.8	0.83	2.62	0.80	3.11	3.08	6.50	
Mar-08	8,950	90	2.794%	70%	1.76	0.31	1.1		500	808	1.598%	70%	9.04	1.60	105.3	24,600	28	2.94%	70%	0.58	0.10	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	0.80	2.62	2.02	1.0	3.6	0.8	0.88	2.75	0.85	3.20	3.16	6.59	
Apr-08	8,950	90	2.794%	175%	4.40	0.78	2.9		500	808	1.598%	175%	22.60	4.00	263.2	24,600	28	2.94%	175%	1.46	0.26	0.3	0	0	0.00%	175%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	0.85	2.75	5.04	1.5	6.3	1.5	1.52	4.78	1.47	4.33	4.04	7.55	
May-08	8,950	90	2.794%	170%	4.27	0.76	2.8		500	808	1.598%	170%	21.95	3.89	255.6	24,600	28	2.94%	170%	1.42	0.25	0.3	0	0	0.00%	170%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	1.47	4.78	4.90	3.0	6.7	1.6	1.61	5.06	1.56	4.47	4.15	7.66	
Jun-08	8,950	90	2.794%	150%	3.77	0.67	2.5		500	808	1.598%	150%	19.37	3.43	225.6	24,600	28	2.94%	150%	1.25	0.22	0.3	0	0	0.00%	150%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	1.56	5.06	4.32	4.5	4.9	1.1	1.18	3.70	1.14	3.76	3.61	7.09	
Jul-08	8,950	90	2.794%	40%	1.01	0.18	0.7		500	808	1.598%	40%	5.17	0.92	60.2	24,600	28	2.94%	40%	0.33	0.06	0.1	0	0	0.00%	40%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	1.14	3.70	1.15	4.5	0.4	0.1	0.09	0.27	0.08	0.89	1.11	3.71	
Aug-08	8,950	90	2.794%	60%	1.51	0.27	1.0		500	808	1.598%	60%	7.75	1.37	90.2	24,600	28	2.94%	60%	0.50	0.09	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	0.08	0.27	1.73	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-08	8,950	90	2.794%	150%	3.77	0.67	2.5		500	808	1.598%	150%	19.37	3.43	225.6	24,600	28	2.94%	150%	1.25	0.22	0.3	0	0	0.00%	150%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	0.00	0.00	4.32	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-08	8,950	90	2.794%	75%	1.89	0.33	1.2		500	808	1.598%	75%	9.69	1.72	112.8	24,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	0.00	0.00	2.16	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-08	8,950	90	2.794%	75%	1.89	0.33	1.2		500	808	1.598%	75%	9.69	1.72	112.8	24,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	0.00	0.00	2.16	1.0	1.2	0.3	0.28	0.88	0.27	1.71	1.89	4.97	
Dec-08	8,950	90	2.794%	100%	2.51	0.45	1.6		500	808	1.598%	100%	12.91	2.29	150.4	24,600	28	2.94%	100%	0.83	0.15	0.2	0	0	0.00%	100%	0.00	0.00	0.0	3.25	34050	4.29	45000	34,050	0.27	0.88	2.88	1.0	2.8	0.6	0.67	2.09	0.64	2.75	2.79	6.15	
Jan-09	700	0	0.000%	60%	0.00	0.00	0.0		500	600	1.979%	60%	7.13	1.26	83.0	40,900	18	2.94%	60%	0.31	0.05	0.0	0	0	0.00%	60%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	0.64	2.09	1.32	1.0	2.4	0.5	0.68	1.73	0.53	2.47	2.56	5.87	
Feb-09	700	0	0.000%	75%	0.00	0.00	0.0		500	600	1.979%	75%	8.91	1.58	103.7	40,900	18	2.94%	75%	0.39	0.07	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	0.53	1.73	1.65	1.0	2.4	0.5	0.67	1.71	0.52	2.45	2.54	5.85	
Mar-09	700	0	0.000%	70%	0.00	0.00	0.0		500	600	1.979%	70%	8.31	1.47	96.8	40,900	18	2.94%	70%	0.36	0.06	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	0.52	1.71	1.54	1.0	2.2	0.5	0.63	1.61	0.49	2.38	2.48	5.76	
Apr-09	700	0	0.000%	175%	0.00	0.00	0.0		500	600	1.979%	175%	20.78	3.68	242.0	40,900	18	2.94%	175%	0.90	0.16	0.1	0	0	0.00%	175%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	0.49	1.61	3.84	1.5	4.0	0.9	1.12	2.83	0.87	3.25	3.20	6.63	
May-09	700	0	0.000%	170%	0.00	0.00	0.0		500	600	1.979%	170%	20.19	3.58	235.1	40,900	18	2.94%	170%	0.87	0.16	0.1	0	0	0.00%	170%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	0.87	2.83	3.73	3.0	3.6	0.8	1.01	2.56	0.79	3.07	3.05	6.47	
Jun-09	700	0	0.000%	150%	0.00	0.00	0.0		500	600	1.979%	150%	17.81	3.16	207.4	40,900	18	2.94%	150%	0.77	0.14	0.1	0	0	0.00%	150%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	0.79	2.56	3.29	4.5	1.4	0.3	0.38	0.97	0.30	1.80	1.97	5.09	
Jul-09	700	0	0.000%	40%	0.00	0.00	0.0		500	600	1.979%	40%	4.75	0.84	55.3	40,900	18	2.94%	40%	0.21	0.04	0.0	0	0	0.00%	40%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	0.30	0.97	0.88	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-09	700	0	0.000%	60%	0.00	0.00	0.0		500	600	1.979%	60%	7.13	1.26	83.0	40,900	18	2.94%	60%	0.31	0.05	0.0	0	0	0.00%	60%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	0.00	0.00	1.32	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-09	700	0	0.000%	150%	0.00	0.00	0.0		500	600	1.979%	150%	17.81	3.16	207.4	40,900	18	2.94%	150%	0.77	0.14	0.1	0	0	0.00%	150%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	0.00	0.00	3.29	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-09	700	0	0.000%	75%	0.00	0.00	0.0		500	600	1.979%	75%	8.91	1.58	103.7	40,900	18	2.94%	75%	0.39	0.07	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	0.00	0.00	1.65	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-09	700	0	0.000%	75%	0.00	0.00	0.0		500	600	1.979%	75%	8.91	1.58	103.7	40,900	18	2.94%	75%	0.39	0.07	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	0.00	0.00	1.65	1.0	0.6	0.1	0.18	0.46	0.14	1.20	1.42	4.24	
Dec-09	700	0	0.000%	100%	0.00	0.00	0.0		500	600	1.979%	100%	11.88	2.10	138.3	40,900	18	2.94%	100%	0.51	0.09	0.1	0	0	0.00%	100%	0.00	0.00	0.0	3.25	42100	4.53	60000	42,100	0.14	0.46	2.20	1.0	1.7	0.4	0.47	1.19	0.37	2.01	2.16	5.35	
Jan-10	700	0	0.000%	60%	0.00	0.00	0.0		500	183	2.256%	60%	2.48	0.44	28.9	39,200	11	2.94%	60%	0.19	0.03	0.0	0	0	0.00%	60%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.37	1.19	0.47	1.0	0.7	0.1	0.18	0.48	0.15	1.23	1.44	4.28	
Feb-10	700	0	0.000%	75%	0.00	0.00	0.0		500	183	2.256%	75%	3.10	0.55	36.1	39,200	11	2.94%	75%	0.24	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.15	0.48	0.59	1.0	0.1	0.0	0.02	0.05	0.02	0.37	0.54	2.49	
Mar-10	700	0	0.000%	70%	0.00	0.00	0.0		500	183	2.256%	70%	2.90	0.51	33.7	39,200	11	2.94%	70%	0.22	0.04	0.0	0	0	0.00%	70%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.02	0.05	0.55	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Apr-10	700	0	0.000%	175%	0.00	0.00	0.0		500	183	2.256%	175%	7.24	1.28	84.3	39,200	11	2.94%	175%	0.56	0.10	0.1	0	0	0.00%	175%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.00	0.00	1.38	1.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-10	700	0	0.000%	170%	0.00	0.00	0.0		500	183	2.256%	170%	7.03	1.25	81.9	39,200	11	2.94%	170%	0.55	0.10	0.1	0	0	0.00%	170%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.00	0.00	1.34	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-10	700	0	0.000%	150%	0.00	0.00	0.0		500	183	2.256%	150%	6.21	1.10	72.3	39,200	11	2.94%	150%	0.48	0.09	0.1	0	0	0.00%	150%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.00	0.00	1.18	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-10	700	0	0.000%	40%	0.00	0.00	0.0		500	183	2.256%	40%	1.65	0.29	19.3	39,200	11	2.94%	40%	0.13	0.02	0.0	0	0	0.00%	40%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.00	0.00	0.32	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-10	700	0	0.000%	60%	0.00	0.00	0.0		500	183	2.256%	60%	2.48	0.44	28.9	39,200	11	2.94%	60%	0.19	0.03	0.0	0	0	0.00%	60%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.00	0.00	0.47	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-10	700	0	0.000%	150%	0.00	0.00	0.0		500	183	2.256%	150%	6.21	1.10	72.3	39,200	11	2.94%	150%	0.48	0.09	0.1	0	0	0.00%	150%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.00	0.00	1.18	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-10	700	0	0.000%	75%	0.00	0.00	0.0		500	183	2.256%	75%	3.10	0.55	36.1	39,200	11	2.94%	75%	0.24	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.00	0.00	0.59	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-10	700	0	0.000%	75%	0.00	0.00	0.0		500	183	2.256%	75%	3.10	0.55	36.1	39,200	11	2.94%	75%	0.24	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.00	0.00	0.59	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-10	700	0	0.000%	100%	0.00	0.00	0.0		500	183	2.256%	100%	4.14	0.73	48.2	39,200	11	2.94%	100%	0.32	0.06	0.0	0	0	0.00%	100%	0.00	0.00	0.0	3.25	40400	4.48	60000	40,400	0.00	0.00	0.79	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jan-11	700	0	0.000%	60%	0.00	0.00	0.0		500	23	2.794%	60%	0.39	0.07	4.6	37,400	33	2.94%	60%	0.57	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.00	0.00	0.17	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Feb-11	700	0	0.000%	75%	0.00	0.00	0.0		500	23	2.794%	75%	0.49	0.09	5.7	37,400	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.00	0.00	0.21	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Mar-11	700	0	0.000%	70%	0.00	0.00	0.0		500	23	2.794%	70%	0.46	0.08	5.3	37,400	33	2.94%	70%	0.67	0.12	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.00	0.00	0.20	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Apr-11	700	0	0.000%	175%	0.00	0.00	0.0		500	23	2.794%	175%	1.14	0.20	13.3	37,400	33	2.94%	175%	1.67	0.30	0.3	0	0	0.00%	175%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.00	0.00	0.50	1.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-11	700	0	0.000%	170%	0.00	0.00	0.0		500	23	2.794%	170%	1.11	0.20	12.9	37,400	33	2.94%	170%	1.62	0.29	0.3	0	0	0.00%	170%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.00	0.00	0.48	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-11	700	0	0.000%	150%	0.00	0.00	0.0		500	23	2.794%	150%	0.98	0.17	11.4	37,400	33	2.94%	150%	1.43	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.00	0.00	0.43	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-11	700	0	0.000%	40%	0.00	0.00	0.0		500	23	2.794%	40%	0.26	0.05	3.0	37,400	33	2.94%	40%	0.38	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.00	0.00	0.11	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-11	700	0	0.000%	60%	0.00	0.00	0.0		500	23	2.794%	60%	0.39	0.07	4.6	37,400	33	2.94%	60%	0.57	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.00	0.00	0.17	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-11	700	0	0.000%	150%	0.00	0.00	0.0		500	23	2.794%	150%	0.98	0.17	11.4	37,400	33	2.94%	150%	1.43	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.00	0.00	0.43	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-11	700	0	0.000%	75%	0.00	0.00	0.0		500	23	2.794%	75%	0.49	0.09	5.7	37,400	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.00	0.00	0.21	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Enhanced Natural Degradation in North Inlet

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Nov-11	700	0	0.000%	75%	0.00	0.00	0.0		500	23	2.794%	75%	0.49	0.09	5.7	37,400	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.00	0.00	0.21	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-11	700	0	0.000%	100%	0.00	0.00	0.0		500	23	2.794%	100%	0.65	0.12	7.6	37,400	33	2.94%	100%	0.96	0.17	0.1	0	0	0.00%	100%	0.00	0.00	0.0	3.25	38600	4.42	60000	38,600	0.00	0.00	0.28	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jan-12	700	0	0.000%	60%	0.00	0.00	0.0		500	1	2.794%	60%	0.02	0.00	0.2	37,350	30	2.94%	60%	0.53	0.09	0.1	2,100	190	0.92%	60%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.00	0.00	0.41	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Feb-12	700	0	0.000%	75%	0.00	0.00	0.0		500	1	2.794%	75%	0.02	0.00	0.3	37,350	30	2.94%	75%	0.66	0.12	0.1	2,100	190	0.92%	75%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.00	0.00	0.43	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Mar-12	700	0	0.000%	70%	0.00	0.00	0.0		500	1	2.794%	70%	0.02	0.00	0.3	37,350	30	2.94%	70%	0.62	0.11	0.1	2,100	190	0.92%	70%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.00	0.00	0.42	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Apr-12	700	0	0.000%	175%	0.00	0.00	0.0		500	1	2.794%	175%	0.06	0.01	0.7	37,350	30	2.94%	175%	1.54	0.27	0.2	2,100	190	0.92%	175%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.00	0.00	0.59	1.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-12	700	0	0.000%	170%	0.00	0.00	0.0		500	1	2.794%	170%	0.06	0.01	0.6	37,350	30	2.94%	170%	1.50	0.27	0.2	2,100	190	0.92%	170%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.00	0.00	0.59	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-12	700	0	0.000%	150%	0.00	0.00	0.0		500	1	2.794%	150%	0.05	0.01	0.6	37,350	30	2.94%	150%	1.32	0.23	0.2	2,100	190	0.92%	150%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.00	0.00	0.55	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-12	700	0	0.000%	40%	0.00	0.00	0.0		500	1	2.794%	40%	0.01	0.00	0.2	37,350	30	2.94%	40%	0.35	0.06	0.1	2,100	190	0.92%	40%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.00	0.00	0.38	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-12	700	0	0.000%	60%	0.00	0.00	0.0		500	1	2.794%	60%	0.02	0.00	0.2	37,350	30	2.94%	60%	0.53	0.09	0.1	2,100	190	0.92%	60%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.00	0.00	0.41	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-12	700	0	0.000%	150%	0.00	0.00	0.0		500	1	2.794%	150%	0.05	0.01	0.6	37,350	30	2.94%	150%	1.32	0.23	0.2	2,100	190	0.92%	150%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.00	0.00	0.55	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-12	700	0	0.000%	75%	0.00	0.00	0.0		500	1	2.794%	75%	0.02	0.00	0.3	37,350	30	2.94%	75%	0.66	0.12	0.1	2,100	190	0.92%	75%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.00	0.00	0.43	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-12	700	0	0.000%	75%	0.00	0.00	0.0		500	1	2.794%	75%	0.02	0.00	0.3	37,350	30	2.94%	75%	0.66	0.12	0.1	2,100	190	0.92%	75%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.00	0.00	0.43	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-12	700	0	0.000%	100%	0.00	0.00	0.0		500	1	2.794%	100%	0.03	0.01	0.4	37,350	30	2.94%	100%	0.88	0.16	0.1	2,100	190	0.92%	100%	1.76	0.31	4.9	3.25	40650	4.49	60000	40,650	0.00	0.00	0.47	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jan-13	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	37,300	17	2.94%	60%	0.29	0.05	0.0	4,500	376	1.60%	60%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.00	0.00	1.12	1.0	0.1	0.0	0.03	0.08	0.03	0.47	0.65	2.77	
Feb-13	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	37,300	17	2.94%	75%	0.37	0.07	0.1	4,500	376	1.60%	75%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.03	0.08	1.13	1.0	0.2	0.0	0.06	0.15	0.05	0.65	0.85	3.21	
Mar-13	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	37,300	17	2.94%	70%	0.34	0.06	0.1	4,500	376	1.60%	70%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.05	0.15	1.12	1.0	0.3	0.1	0.08	0.20	0.06	0.75	0.96	3.43	
Apr-13	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	37,300	17	2.94%	175%	0.86	0.15	0.1	4,500	376	1.60%	175%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.06	0.20	1.22	1.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-13	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	37,300	17	2.94%	170%	0.83	0.15	0.1	4,500	376	1.60%	170%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.00	0.00	1.21	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-13	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	37,300	17	2.94%	150%	0.74	0.13	0.1	4,500	376	1.60%	150%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.00	0.00	1.19	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-13	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	37,300	17	2.94%	40%	0.20	0.03	0.0	4,500	376	1.60%	40%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.00	0.00	1.10	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-13	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	37,300	17	2.94%	60%	0.29	0.05	0.0	4,500	376	1.60%	60%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.00	0.00	1.12	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-13	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	37,300	17	2.94%	150%	0.74	0.13	0.1	4,500	376	1.60%	150%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.00	0.00	1.19	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-13	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	37,300	17	2.94%	75%	0.37	0.07	0.1	4,500	376	1.60%	75%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.00	0.00	1.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-13	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	37,300	17	2.94%	75%	0.37	0.07	0.1	4,500	376	1.60%	75%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.00	0.00	1.13	1.0	0.1	0.0	0.04	0.09	0.03	0.49	0.68	2.84	
Dec-13	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	37,300	17	2.94%	100%	0.49	0.09	0.1	4,500	376	1.60%	100%	6.00	1.06	7.8	3.25	43000	4.56	60000	43,000	0.03	0.09	1.15	1.0	0.2	0.1	0.07	0.17	0.05	0.70	0.91	3.32	
Jan-14	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,950	21	2.94%	60%	0.37	0.07	0.1	7,200	468	1.98%	60%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.05	0.17	1.70	1.0	0.9	0.2	0.27	0.61	0.19	1.39	1.60	4.53	
Feb-14	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,950	21	2.94%	75%	0.46	0.08	0.1	7,200	468	1.98%	75%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.19	0.61	1.72	1.0	1.3	0.3	0.41	0.92	0.28	1.75	1.93	5.02	
Mar-14	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	38,950	21	2.94%	70%	0.43	0.08	0.1	7,200	468	1.98%	70%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.28	0.92	1.72	1.0	1.6	0.3	0.50	1.13	0.35	1.96	2.12	5.29	
Apr-14	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	38,950	21	2.94%	175%	1.07	0.19	0.2	7,200	468	1.98%	175%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.35	1.13	1.83	1.5	1.5	0.3	0.45	1.01	0.31	1.84	2.01	5.14	
May-14	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	38,950	21	2.94%	170%	1.04	0.18	0.2	7,200	468	1.98%	170%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.31	1.01	1.82	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-14	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,950	21	2.94%	150%	0.92	0.16	0.1	7,200	468	1.98%	150%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.00	0.00	1.80	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-14	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	38,950	21	2.94%	40%	0.25	0.04	0.0	7,200	468	1.98%	40%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.00	0.00	1.68	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-14	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,950	21	2.94%	60%	0.37	0.07	0.1	7,200	468	1.98%	60%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.00	0.00	1.70	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-14	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,950	21	2.94%	150%	0.92	0.16	0.1	7,200	468	1.98%	150%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.00	0.00	1.80	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-14	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,950	21	2.94%	75%	0.46	0.08	0.1	7,200	468	1.98%	75%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.00	0.00	1.72	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-14	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,950	21	2.94%	75%	0.46	0.08	0.1	7,200	468	1.98%	75%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.00	0.00	1.72	1.0	0.7	0.2	0.22	0.50	0.15	1.25	1.46	4.32	
Dec-14	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	38,950	21	2.94%	100%	0.61	0.11	0.1	7,200	468	1.98%	100%	9.25	1.64	7.5	3.25	47350	4.69	60000	47,350	0.15	0.50	1.75	1.0	1.2	0.3	0.38	0.86	0.27	1.69	1.87	4.94	
Jan-15	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	40,600	28	2.94%	60%	0.50	0.09	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.27	0.86	0.09	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Feb-15	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	40,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.00	0.00	0.11	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Mar-15	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	40,600	28	2.94%	70%	0.58	0.10	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.00	0.00	0.10	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Apr-15	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	40,600	28	2.94%	175%	1.46	0.26	0.2	0	0	0.00%	175%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.00	0.00	0.26	1.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-15	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	40,600	28	2.94%	170%	1.42	0.25	0.2	0	0	0.00%	170%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-15	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	40,600	28	2.94%	150%	1.25	0.22	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.00	0.00	0.22	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-15	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	40,600	28	2.94%	40%	0.33	0.06	0.0	0	0	0.00%	40%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.00	0.00	0.06	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-15	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	40,600	28	2.94%	60%	0.50	0.09	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.00	0.00	0.09	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-15	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	40,600	28	2.94%	150%	1.25	0.22	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.00	0.00	0.22	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-15	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	40,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.00	0.00	0.11	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-15	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	40,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.00	0.00	0.11	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-15	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	40,600	28	2.94%	100%	0.83	0.15	0.1	0	0	0.00%	100%	0.00	0.00	0.0	3.25	41800	4.52	60000	41,800	0.00	0.00	0.15	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jan-16	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	40,000	31	2.94%	60%	0.54	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.00	0.00	0.10	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Feb-16	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	40,000	31	2.94%	75%	0.68	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.00	0.00	0.12	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Mar-16	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	40,000	31	2.94%	70%	0.63	0.11	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.00	0.00	0.11	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Enhanced Natural Degradation in North Inlet

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Apr-16	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	40,000	31	2.94%	175%	1.59	0.28	0.2	0	0	0.00%	175%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.00	0.00	0.28	1.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-16	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	40,000	31	2.94%	170%	1.54	0.27	0.2	0	0	0.00%	170%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.00	0.00	0.27	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-16	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	40,000	31	2.94%	150%	1.36	0.24	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.00	0.00	0.24	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-16	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	40,000	31	2.94%	40%	0.36	0.06	0.1	0	0	0.00%	40%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.00	0.00	0.06	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-16	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	40,000	31	2.94%	60%	0.54	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.00	0.00	0.10	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-16	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	40,000	31	2.94%	150%	1.36	0.24	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.00	0.00	0.24	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-16	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	40,000	31	2.94%	75%	0.68	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.00	0.00	0.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-16	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	40,000	31	2.94%	75%	0.68	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.00	0.00	0.12	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-16	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	40,000	31	2.94%	100%	0.91	0.16	0.1	0	0	0.00%	100%	0.00	0.00	0.0	3.25	41200	4.50	60000	41,200	0.00	0.00	0.16	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jan-17	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	39,500	38	2.94%	60%	0.66	0.12	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.12	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Feb-17	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	39,500	38	2.94%	75%	0.83	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.15	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Mar-17	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	39,500	38	2.94%	70%	0.77	0.14	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.14	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Apr-17	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	39,500	38	2.94%	175%	1.93	0.34	0.3	0	0	0.00%	175%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.34	1.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-17	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	39,500	38	2.94%	170%	1.87	0.33	0.3	0	0	0.00%	170%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.33	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-17	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	39,500	38	2.94%	150%	1.65	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.29	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-17	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	39,500	38	2.94%	40%	0.44	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.08	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-17	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	39,500	38	2.94%	60%	0.66	0.12	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.12	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-17	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	39,500	38	2.94%	150%	1.65	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.29	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-17	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	39,500	38	2.94%	75%	0.83	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.15	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-17	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	39,500	38	2.94%	75%	0.83	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.15	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-17	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	39,500	38	2.94%	100%	1.10	0.20	0.2	0	0	0.00%	100%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.20	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jan-18	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	39,000	37	2.94%	60%	0.65	0.11	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.11	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Feb-18	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	39,000	37	2.94%	75%	0.81	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.14	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Mar-18	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	39,000	37	2.94%	70%	0.75	0.13	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.13	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Apr-18	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	39,000	37	2.94%	175%	1.89	0.33	0.3	0	0	0.00%	175%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.33	1.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-18	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	39,000	37	2.94%	170%	1.83	0.32	0.3	0	0	0.00%	170%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.32	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-18	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	39,000	37	2.94%	150%	1.62	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.29	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-18	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	39,000	37	2.94%	40%	0.43	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.08	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-18	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	39,000	37	2.94%	60%	0.65	0.11	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.11	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-18	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	39,000	37	2.94%	150%	1.62	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.29	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-18	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	39,000	37	2.94%	75%	0.81	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.14	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-18	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	39,000	37	2.94%	75%	0.81	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.14	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-18	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	39,000	37	2.94%	100%	1.08	0.19	0.2	0	0	0.00%	100%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.19	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jan-19	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,500	33	2.94%	60%	0.57	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.10	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Feb-19	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,500	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.13	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Mar-19	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	38,500	33	2.94%	70%	0.67	0.12	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.12	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Apr-19	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	38,500	33	2.94%	175%	1.67	0.30	0.3	0	0	0.00%	175%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.30	1.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-19	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	38,500	33	2.94%	170%	1.62	0.29	0.2	0	0	0.00%	170%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-19	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,500	33	2.94%	150%	1.43	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.25	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-19	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	38,500	33	2.94%	40%	0.38	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.07	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-19	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,500	33	2.94%	60%	0.57	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.10	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-19	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,500	33	2.94%	150%	1.43	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.25	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-19	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,500	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-19	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,500	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.13	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-19	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	38,500	33	2.94%	100%	0.96	0.17	0.1	0	0	0.00%	100%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.17	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jan-20	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	42,600	38	2.94%	60%	0.68	0.12	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.00	0.00	0.12	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Feb-20	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	42,600	38	2.94%	75%	0.85	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.00	0.00	0.15	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Mar-20	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	42,600	38	2.94%	70%	0.79	0.14	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.00	0.00	0.14	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Apr-20	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	42,600	38	2.94%	175%	1.97	0.35	0.3	0	0	0.00%	175%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.00	0.00	0.35	1.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-20	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	42,600	38	2.94%	170%	1.92	0.34	0.3	0	0	0.00%	170%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.00	0.00	0.34	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-20	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	42,600	38	2.94%	150%	1.69	0.30	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.00	0.00	0.30	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-20	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	42,600	38	2.94%	40%	0.45	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.00	0.00	0.08	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-20	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	42,600	38	2.94%	60%	0.68	0.12	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.00	0.00	0.12	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Enhanced Natural Degradation in North Inlet

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Sep-20	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	42,600	38	2.94%	150%	1.69	0.30	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.00	0.00	0.30	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-20	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	42,600	38	2.94%	75%	0.85	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.00	0.00	0.15	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-20	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	42,600	38	2.94%	75%	0.85	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.00	0.00	0.15	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-20	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	42,600	38	2.94%	100%	1.13	0.20	0.2	0	0	0.00%	100%	0.00	0.00	0.0	3.25	43800	4.58	60000	43,800	0.00	0.00	0.20	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jan-21	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	46,800	40	2.94%	60%	0.71	0.13	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.00	0.00	0.13	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Feb-21	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	46,800	40	2.94%	75%	0.88	0.16	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.00	0.00	0.16	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Mar-21	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	46,800	40	2.94%	70%	0.82	0.15	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.00	0.00	0.15	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Apr-21	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	46,800	40	2.94%	175%	2.06	0.36	0.3	0	0	0.00%	175%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.00	0.00	0.36	1.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-21	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	46,800	40	2.94%	170%	2.00	0.35	0.2	0	0	0.00%	170%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.00	0.00	0.35	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-21	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	46,800	40	2.94%	150%	1.76	0.31	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.00	0.00	0.31	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-21	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	46,800	40	2.94%	40%	0.47	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.00	0.00	0.08	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-21	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	46,800	40	2.94%	60%	0.71	0.13	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.00	0.00	0.13	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-21	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	46,800	40	2.94%	150%	1.76	0.31	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.00	0.00	0.31	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-21	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	46,800	40	2.94%	75%	0.88	0.16	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.00	0.00	0.16	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-21	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	46,800	40	2.94%	75%	0.88	0.16	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.00	0.00	0.16	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-21	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	46,800	40	2.94%	100%	1.18	0.21	0.1	0	0	0.00%	100%	0.00	0.00	0.0	3.25	48000	4.71	60000	48,000	0.00	0.00	0.21	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jan-22	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	42,200	32	2.94%	60%	0.56	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.00	0.00	0.10	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Feb-22	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	42,200	32	2.94%	75%	0.70	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.00	0.00	0.12	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Mar-22	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	42,200	32	2.94%	70%	0.65	0.12	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.00	0.00	0.12	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Apr-22	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	42,200	32	2.94%	175%	1.63	0.29	0.2	0	0	0.00%	175%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.00	0.00	0.29	1.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-22	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	42,200	32	2.94%	170%	1.58	0.28	0.2	0	0	0.00%	170%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.00	0.00	0.28	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-22	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	42,200	32	2.94%	150%	1.40	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.00	0.00	0.25	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-22	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	42,200	32	2.94%	40%	0.37	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.00	0.00	0.07	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-22	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	42,200	32	2.94%	60%	0.56	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.00	0.00	0.10	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-22	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	42,200	32	2.94%	150%	1.40	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.00	0.00	0.25	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-22	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	42,200	32	2.94%	75%	0.70	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.00	0.00	0.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-22	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	42,200	32	2.94%	75%	0.70	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.00	0.00	0.12	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-22	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	42,200	32	2.94%	100%	0.93	0.16	0.1	0	0	0.00%	100%	0.00	0.00	0.0	3.25	43400	4.57	60000	43,400	0.00	0.00	0.16	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jan-23	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	37,700	35	2.94%	60%	0.62	0.11	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.00	0.00	0.11	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Feb-23	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	37,700	35	2.94%	75%	0.77	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.00	0.00	0.14	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Mar-23	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	37,700	35	2.94%	70%	0.72	0.13	0.1	0	0	0.00%	70%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.00	0.00	0.13	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Apr-23	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	37,700	35	2.94%	175%	1.80	0.32	0.3	0	0	0.00%	175%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.00	0.00	0.32	1.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-23	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	37,700	35	2.94%	170%	1.75	0.31	0.3	0	0	0.00%	170%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.00	0.00	0.31	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-23	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	37,700	35	2.94%	150%	1.54	0.27	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.00	0.00	0.27	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-23	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	37,700	35	2.94%	40%	0.41	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.00	0.00	0.07	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-23	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	37,700	35	2.94%	60%	0.62	0.11	0.1	0	0	0.00%	60%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.00	0.00	0.11	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-23	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	37,700	35	2.94%	150%	1.54	0.27	0.2	0	0	0.00%	150%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.00	0.00	0.27	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-23	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	37,700	35	2.94%	75%	0.77	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.00	0.00	0.14	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-23	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	37,700	35	2.94%	75%	0.77	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.00	0.00	0.14	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-23	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	37,700	35	2.94%	100%	1.03	0.18	0.2	0	0	0.00%	100%	0.00	0.00	0.0	3.25	38900	4.43	60000	38,900	0.00	0.00	0.18	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jan-24	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,300	10	2.94%	60%	0.18	0.03	0.0	0	0	0.00%	60%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.00	0.00	0.03	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Feb-24	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,300	10	2.94%	75%	0.22	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.00	0.00	0.04	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Mar-24	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	38,300	10	2.94%	70%	0.21	0.04	0.0	0	0	0.00%	70%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.00	0.00	0.04	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Apr-24	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	38,300	10	2.94%	175%	0.51	0.09	0.1	0	0	0.00%	175%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.00	0.00	0.09	1.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-24	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	38,300	10	2.94%	170%	0.50	0.09	0.1	0	0	0.00%	170%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.00	0.00	0.09	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-24	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,300	10	2.94%	150%	0.44	0.08	0.1	0	0	0.00%	150%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.00	0.00	0.08	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-24	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	38,300	10	2.94%	40%	0.12	0.02	0.0	0	0	0.00%	40%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.00	0.00	0.02	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-24	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,300	10	2.94%	60%	0.18	0.03	0.0	0	0	0.00%	60%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.00	0.00	0.03	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-24	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,300	10	2.94%	150%	0.44	0.08	0.1	0	0	0.00%	150%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.00	0.00	0.08	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-24	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,300	10	2.94%	75%	0.22	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.00	0.00	0.04	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-24	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,300	10	2.94%	75%	0.22	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.00	0.00	0.04	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-24	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	38,300	10	2.94%	100%	0.29	0.05	0.0	0	0	0.00%	100%	0.00	0.00	0.0	3.25	39500	4.45	60000	39,500	0.00	0.00	0.05	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jan-25	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,900	0	2.94%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.00	0.00	0.00	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Enhanced Natural Degradation in North Inlet

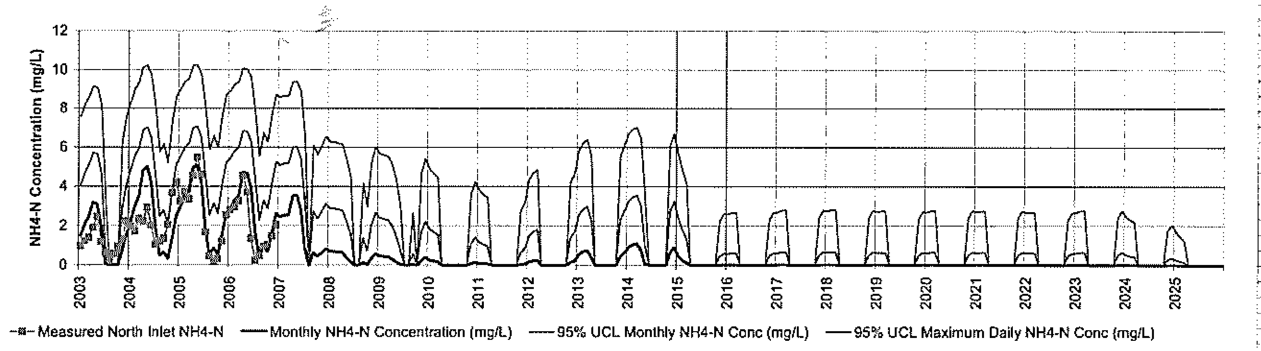
	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Feb-25	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,900	0	2.94%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.00	0.00	0.00	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Mar-25	700	0	0.000%	70%	0.00	0.00	0.0		500	0	0.000%	70%	0.00	0.00	0.0	38,900	0	2.94%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.00	0.00	0.00	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Apr-25	700	0	0.000%	175%	0.00	0.00	0.0		500	0	0.000%	175%	0.00	0.00	0.0	38,900	0	2.94%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.00	0.00	0.00	1.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-25	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	38,900	0	2.94%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-25	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,900	0	2.94%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.00	0.00	0.00	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-25	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	38,900	0	2.94%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.00	0.00	0.00	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-25	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,900	0	2.94%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.00	0.00	0.00	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-25	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,900	0	2.94%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.00	0.00	0.00	4.5	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-25	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,900	0	2.94%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-25	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,900	0	2.94%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.00	0.00	0.00	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-25	700	0	0.000%	100%	0.00	0.00	0.0		500	0	0.000%	100%	0.00	0.00	0.0	38,900	0	2.94%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	3.25	40100	4.47	60000	40,100	0.00	0.00	0.00	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Temporal Segregation plus Snowmaking

WLWB AMMONIA MANAGEMENT MODEL OF DIAVIK PROJECT

CASE:	**Temporal Segregation of High Ammonia Streams**
BLASTING:	Current practices: open hole: 65/35 emulsion/ANFO mix; no liner; wet holes pumped and double primed; large area blasts
AN USE:	Past and future use as per Diavik ADP projections (SNC-Lavalin, Ammonia Balance, May 2006)
MINE INFLOW:	Actual inflow to present; predicted inflows (Golder, 2006) in future, modified to reflect underground dewatering beneath the underground ore development.
WATER MANAGEMENT:	All mine water discharged to North Inlet
TREATMENT:	Natural biological degradation in North Inlet to continue at current rate; treatment of segregated high-ammonia water by snowmaking implemented in mid-2007
FLOW TO LAC DE GRAS:	Actual to present, future discharge equal to input in same month.

RESULTS	**FROM BEGINNING OF**	**03**	**07**	**08**
AMMONIA (N) TO LDG	**TO END OF**	**06**	**07**	**25**
	Average	2.3	1.7	0.1
	Maximum 30 Day	5.1	3.5	1.1
	Maximum 1 Day	8.6	7.0	3.7
	Maximum 95% UCL 30 Day	7.1	6.0	3.5
	Maximum 95% UCL 1 Day	10.3	9.4	7.0



WLWB Ammonia Model - Temporal Segregation plus Snowmaking

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N Input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Jan-03	5,380	867	0.924%	60%	4.80	0.85	5.2	8.4	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	5380	1.41	32000	17,905	1.00	1.25	0.85	0.0	2.1	1.5	0.81	1.29	1.49	4.35	4.06	7.57	1.0
Feb-03	5,667	867	0.924%	75%	6.00	1.06	6.2	7.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	5667	1.42	32000	17,175	1.49	1.86	1.06	0.0	2.9	2.1	1.07	1.85	2.05	5.20	4.70	8.20	1.3
Mar-03	5,954	867	0.924%	70%	5.60	0.99	5.5	5.1	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	5954	1.43	32000	16,854	2.05	2.57	0.99	0.0	3.6	2.5	1.28	2.29	2.49	5.78	5.12	8.60	1.4
Apr-03	6,251	867	0.924%	175%	14.01	2.48	13.0	10.5	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	1.25	6251	1.44	32000	16,875	2.49	3.11	2.48	1.0	4.6	3.2	1.64	2.96	3.19	6.62	5.73	9.14	1.9
May-03	5,936	867	0.924%	170%	13.61	2.41	13.3	5.4	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	1.25	5936	1.43	32000	25,514	3.19	3.99	2.41	2.0	4.4	3.1	2.39	2.01	3.07	6.49	5.64	9.06	2.5
Jun-03	7,290	867	0.924%	150%	12.01	2.13	9.6	3.2	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	7290	1.47	32000	29,485	3.07	3.84	2.13	3.0	3.0	2.0	1.81	1.16	2.02	5.15	4.66	8.16	1.2
Jul-03	6,867	867	0.924%	40%	3.20	0.57	2.7	6.7	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	6867	1.46	32000	28,379	2.02	2.52	0.57	3.0	0.1	0.1	0.05	0.04	0.06	0.76	0.98	3.45	0.6
Aug-03	7,753	867	0.924%	60%	4.80	0.85	3.6	6.1	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	7753	1.49	32000	27,138	0.06	0.08	0.85	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.2
Sep-03	8,194	867	0.924%	150%	12.01	2.13	8.5	8.4	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	8194	1.50	32000	29,865	0.00	0.00	2.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.6
Oct-03	8,775	867	0.924%	75%	6.00	1.06	4.0	6.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	8775	1.52	32000	27,977	0.00	0.00	1.06	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.9
Nov-03	8,935	867	0.924%	75%	6.00	1.06	3.9	6.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	8935	1.52	32000	15,411	0.00	0.00	1.06	0.0	1.1	0.7	0.33	0.74	0.70	2.87	2.89	6.28	1.3
Dec-03	8,301	867	0.924%	100%	8.01	1.42	5.6	5.1	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	8301	1.50	32000	24,385	0.70	0.87	1.42	0.0	2.3	1.5	1.13	1.16	1.53	4.42	4.11	7.62	2.2
Jan-04	8,570	808	1.598%	60%	7.75	1.37	5.3	4.3	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	8570	1.51	32000	13,372	1.53	1.91	1.37	0.0	3.3	2.2	0.88	2.40	2.17	5.36	4.82	8.31	2.0
Feb-04	7,982	808	1.598%	75%	9.69	1.72	7.1	5.9	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	7982	1.49	32000	7,407	2.17	2.71	1.72	0.0	4.4	3.0	0.67	3.76	2.97	6.37	5.55	8.98	1.7
Mar-04	8,828	808	1.598%	70%	9.04	1.60	6.0	6.0	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	8828	1.52	32000	3,826	2.97	3.71	1.60	0.0	5.3	3.5	0.41	4.91	3.50	6.97	5.97	9.35	2.4
Apr-04	9,324	808	1.598%	175%	22.60	4.00	14.1	5.3	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	1.25	9324	1.53	32000	0	3.50	4.37	4.00	1.0	7.4	4.8	0.00	7.38	4.81	8.30	6.89	10.12	2.2
May-04	10,755	808	1.598%	170%	21.95	3.89	11.9	9.3	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	1.25	10755	1.58	32000	0	4.81	6.01	3.89	2.0	7.9	5.0	0.00	7.90	5.01	8.49	7.02	10.22	2.9
Jun-04	12,337	808	1.598%	150%	19.37	3.43	9.1	5.3	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	12337	1.63	32000	16,027	5.01	6.26	3.43	3.0	6.7	4.1	2.01	4.69	4.12	7.63	6.43	9.74	2.0
Jul-04	11,098	808	1.598%	40%	5.17	0.92	2.7	13.4	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	11098	1.59	32000	25,310	4.12	5.15	0.92	3.0	3.1	1.9	1.49	1.58	1.93	5.03	4.57	8.07	1.1
Aug-04	11,394	808	1.598%	60%	7.75	1.37	4.0	8.9	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	11394	1.60	32000	28,658	1.93	2.41	1.37	3.0	0.8	0.5	0.43	0.36	0.49	2.37	2.47	5.76	1.2
Sep-04	12,030	808	1.598%	150%	19.37	3.43	9.4	6.7	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	12030	1.62	32000	27,577	0.49	0.62	3.43	3.0	1.0	0.6	0.54	0.50	0.65	2.76	2.80	6.17	1.3
Oct-04	11,948	808	1.598%	75%	9.69	1.72	4.7	6.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11948	1.61	32000	13,563	0.65	0.81	1.72	2.0	0.5	0.3	0.14	0.39	0.33	1.89	2.06	5.20	2.1
Nov-04	11,300	808	1.598%	75%	9.69	1.72	5.0	7.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11300	1.59	32000	12,590	0.33	0.41	1.72	0.0	2.1	1.3	0.51	1.61	1.33	4.10	3.87	7.37	3.7
Dec-04	10,514	808	1.598%	100%	12.91	2.29	7.2	5.1	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	10514	1.57	32000	11,561	1.33	1.67	2.29	0.0	4.0	2.5	0.89	3.07	2.52	5.82	5.15	8.62	4.2
Jan-05	10,958	725	1.979%	60%	8.61	1.53	4.6	4.5	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	10958	1.58	32000	10,692	2.52	3.15	1.53	0.0	4.7	3.0	0.96	3.72	2.95	6.35	5.53	8.97	3.3
Feb-05	11,359	725	1.979%	75%	10.76	1.91	5.5	4.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11359	1.60	32000	12,385	2.95	3.69	1.91	0.0	5.6	3.5	1.32	4.28	3.51	6.98	5.98	9.36	3.7
Mar-05	12,270	725	1.979%	70%	10.04	1.78	4.8	5.8	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	12270	1.62	32000	12,748	3.51	4.39	1.78	0.0	6.2	3.8	1.47	4.69	3.80	7.29	6.20	9.55	3.4
Apr-05	13,110	725	1.979%	175%	25.11	4.45	11.2	11.5	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	1.25	13110	1.65	32000	13,667	3.80	4.75	4.45	1.0	8.2	5.0	2.07	6.13	4.97	8.46	7.00	10.20	4.6
May-05	14,120	725	1.979%	170%	24.39	4.32	10.1	11.7	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	1.25	14120	1.68	32000	16,000	4.97	6.22	4.32	2.0	8.5	5.1	2.47	6.06	5.08	8.56	7.07	10.26	5.5
Jun-05	15,045	725	1.979%	150%	21.52	3.81	8.3	10.7	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	15045	1.71	32000	17,531	5.08	6.35	3.81	3.0	7.2	4.2	2.24	4.93	4.20	7.70	6.48	9.79	4.6
Jul-05	15,261	725	1.979%	40%	5.74	1.02	2.2	5.1	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	15261	1.71	32000	8,477	4.20	5.25	1.02	3.0	3.3	1.9	0.49	2.77	1.90	4.99	4.54	8.05	1.7
Aug-05	14,863	725	1.979%	60%	8.61	1.53	3.4	3.3	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	14863	1.70	32000	17,738	1.90	2.38	1.53	3.0	0.9	0.5	0.29	0.62	0.53	2.48	2.56	5.87	0.5
Sep-05	15,820	725	1.979%	150%	21.52	3.81	7.9	2.2	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	15820	1.73	32000	24,395	0.53	0.67	3.81	3.0	1.5	0.9	0.63	0.85	0.86	3.21	3.17	6.60	0.2
Oct-05	15,681	725	1.979%	75%	10.76	1.91	4.0	2.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15681	1.73	32000	21,915	0.86	1.07	1.91	2.0	1.0	0.6	0.38	0.60	0.57	2.56	2.63	5.96	0.3
Nov-05	15,693	725	1.979%	75%	10.76	1.91	4.0	3.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15693	1.73	32000	17,253	0.57	0.71	1.91	0.0	2.6	1.5	0.79	1.82	1.51	4.40	4.10	7.60	1.2
Dec-05	14,884	725	1.979%	100%	14.35	2.54	5.6	6.3	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	14884	1.70	32000	14,961	1.51	1.89	2.54	0.0	4.4	2.6	1.19	3.25	2.60	5.92	5.23	8.69	2.6
Jan-06	15,584	642	2.256%	60%	8.69	1.54	3.2	3.7	250	0	0.000%	60%	0.00	0.00	0.0	0	46	2.94%	60%	0.81	0.14	#DIV/0!	0	0	0.00%	60%	0.00	0.00	0.0	1.25	15834	1.73	32000	15,041	2.60	3.26	1.68	0.0	4.9	2.9	1.30	3.63	2.85	6.23	5.45	8.89	2.8
Feb-06	15,104	642	2.256%	75%	10.86	1.92	4.2	4.8	250	0	0.000%	75%	0.00	0.00	0.0	0	46	2.94%	75%	1.01	0.18	#DIV/0!	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15354	1.72	32000	15,114	2.85	3.56	2.10	0.0	5.7	3.3	1.52	4.15	3.30	6.75	5.82	9.22	3.0
Mar-06	15,618	642	2.256%	70%	10.14	1.80	3.8	3.1	250	0	0.000%	70%	0.00	0.00	0.0	0	46	2.94%	70%	0.94	0.17	#DIV/0!	0	0	0.00%	70%	0.00	0.00	0.0	1.25	15868	1.73	32000	19,356	3.30	4.13	1.96	0.0	6.1	3.5	2.07	4.02	3.51	6.99	5.99	9.36	3.3
Apr-06	16,453	642	2.256%	175%	25.34	4.49	9.0	9.6	250	0	0.000%	175%	0.00	0.00	0.0	0	46	2.94%	175%	2.35	0.42	#DIV/0!	0	0	0.00%	175%	0.00	0.00	0.0	1.25	16703	1.76	32000	17,439	3.51	4.39	4.91	1.0	8.3	4.7	2.50	5.80	4.72	8.22	6.84	10.07	4.6
May-06	19,475	642	2.256%	170%	24.61	4.36	7.4	5.3	250	0	0.000%	170%	0.00	0.00	0.0	0	46	2.94%	170%	2.28	0.40	#DIV/0!	0	0	0.00%	170%	0.00	0.00	0.0	1.25	19725	1.85	32000	20,203	4.72	5.90	4.77	2.0	8.7	4.7	2.88	5.79	4.69	8.18	6.81	10.06	3.7
Jun-06	18,310	642	2.256%	150%	21.72	3.85	6.9	3.4	250	0	0.000%	150%	0.00	0.00	0.0	22	46	2.94%	150%	2.01	0.36	531.3	0	0	0.00%	150%	0.00	0.00	0.0	1.25	18582	1.82	32000	27,717	4.69	5.86	4.21	3.0	7.1	3.9	3.28	3.78	3.89	7.39	6.27	9.60	1.4
Jul-06	17,677	642	2.256%	40%	5.79	1.03	1.9	4.4	250	0	0.000%	40%	0.00	0.00	0.0	40	46	2.94%	40%	0.54	0.10	77.3	0	0	0.00%	40%	0.00	0.00	0.0	1.25	17967	1.80	32000	22,154	3.89	4.86	1.12	3.0	3.0	1.7	1.12	1.87	1.66	4.63	4.27	7.78	0.2
Aug-06	18,560	642	2.256%	60%	8.69	1.54	2.7	7.3	250	0	0.000%	60%	0.00	0.00	0.0	38	46	2.94%	60%	0.81	0.14	122.6	0	0	0.00%	60%	0.00	0.00	0.0	1.25	18849	1.82	32000	18,801	1.66	2.08	1.68	3.0	0.8	0.4	0.24	0.52	0.42	2.16	2.29	5.52	0.5
Sep-06	19,176	642	2.256%	150%	21.72	3.85	6.6	5.4	250	0	0.000%	150%	0.00	0.00	0.0	154	46	2.94%	150%	2.01	0.36	76.1	0	0	0.00%	150%	0.00	0.00	0.0	1.25	19580	1.85	32000	25,748	0.42	0.52	4.21	3.0	1.7	0.9	0.73	0.99	0.94	3.37	3.30	6.75	1.0
Oct-06	18,487	642	2.256%	75%	10.86	1.92	3.4	3.7	250	0	0.000%	75%	0.00	0.00	0.0	430	46	2.94%	75%	1.01	0.18	13.6	0	0	0.00%	75%	0.00	0.00	0.0	1.25	19166	1.83	32000	26,010	0.94	1.17	2.10	2.0	1.3	0.7	0.55	0.72	0.69	2.86	2.88	6.27	1.1
Nov-06	19,635	642	2.256%	75%	10.86	1.92	3.2	2.4	250	0	0.000%	75%	0.00	0.00	0.0	687	46	2.94%	75%	1.01	0.18	8.5	0	0	0.00%	75%	0.00	0.00	0.0	1.25	20572	1.88	32000	23,981	0.69	0.87	2.10	0.0	3.0	1.6	1.16	1.82	1.58	4.51	4.18	7.69	1.5
Dec-06	17,652	642	2.256%	100%	14.48	2.57	4.8	4.5	250	0	0.000%	100%	0.00	0.00	0.0	929	46	2.94%	100%	1.34	0.24	8.4	0	0	0.00%	100%	0.00	0.00	0.0	1.25	18831	1.82	32000	19,976	1.58	1.98	2.80	0.0	4.8	2.6	1.59	3.19	2.62	5.95	5.25	8.71	2.1
Jan-07	17,200	408	2.794%	60%	6.84	1.21	2.3		500	400	0.924%	60%	2.22	0.39	25.8	8,200	33	2.94%	60%	0.57	0.10	0.4	0	0	0.00%	60%	0.00	0.00	0.0	1.25	25900	2.04	32000	25,900	2.62	3.28	1.71	0.0	5.0	2.4	1.93	3.06	2.45	5.73	5.09	8.56	
Feb-07	17,200	408	2.794%	75%	8.56	1.52	2.9		500	400	0.924%	75%	2.77	0.49	32.3	8,200	33	2.94%	75%	0.72	0.13	0.5	0	0	0.00%	75%	0.00	0.00	0.0	1.25	25900	2.04	32000	25,900	2.45	3.06	2.13	0.0	5.2	2.5	2.01	3.19	2.55	5.86	5.18	8.65	
Mar-07	17,200	408	2.794%	70%	7.99	1.42	2.7		500	400	0.924%	70%	2.59	0.46	30.1	8,200	33	2.94%	70%	0.67	0.12	0.5	0	0	0.00%	70%	0.00	0.00	0.0	1.25	25900	2.04	32000	25,900	2.55	3.19	1.99	0.0	5.2	2.5	2.00	3.18	2.54	5.85	5.17	8.64	
Apr-07	17,200	408	2.794%	175%	19.96	3.54	6.8		500	400	0.924%	175%	6.47	1.15	75.3	8,200	33	2.94%	175%	1.67	0.30	1.2	0	0	0.00%	175%	0.00	0.00	0.0	1.25	25900	2.04	32000	25,900	2.54	3.18	4.98	1.0	7.2	3.5	2.77	4.39	3.51	6.98	5.98	9.36	
May-07	17,200	408	2.794%	170%	19.39	3.44	6.6		500	400	0.924%	170%	6.28	1.11	73.1	8,200	33	2.94%	170%	1.62	0.29	1.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	25900	2.04	45000	25,900	3.51	4.39	4.84	2.0	7.2	3.5	2.79	4.43	3.55	7.02	6.01	9.39	

WLWB Ammonia Model - Temporal Segregation plus Snowmaking

	SURFACE MINE A154								SURFACE MINE A418						
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)
Jun-07	17,200	408	2.794%	150%	17.11	3.03	5.8		500	400	0.924%	150%	5.54	0.98	64.5
Jul-07	17,200	408	2.794%	40%	4.56	0.81	1.5		500	400	0.924%	40%	1.48	0.26	17.2
Aug-07	17,200	408	2.794%	60%	6.84	1.21	2.3		500	400	0.924%	60%	2.22	0.39	25.8
Sep-07	17,200	408	2.794%	150%	17.11	3.03	5.8		500	400	0.924%	150%	5.54	0.98	64.5
Oct-07	17,200	408	2.794%	75%	8.56	1.52	2.9		500	400	0.924%	75%	2.77	0.49	32.3
Nov-07	4,300	408	0.922%	75%	2.82	0.50	3.8		125	400	0.305%	75%	0.91	0.16	42.6
Dec-07	4,300	408	0.922%	100%	3.76	0.67	5.1		125	400	0.305%	100%	1.22	0.22	56.8
Jan-08	2,238	90	0.922%	60%	0.50	0.09	1.3		125	808	0.527%	60%	2.56	0.45	119.1
Feb-08	2,238	90	0.922%	75%	0.62	0.11	1.6		125	808	0.527%	75%	3.20	0.57	148.9
Mar-08	2,238	90	0.922%	70%	0.58	0.10	1.5		125	808	0.527%	70%	2.98	0.53	139.0
Apr-08	2,238	90	0.922%	175%	1.45	0.26	3.8		125	808	0.527%	175%	7.46	1.32	347.4
May-08	8,950	90	2.794%	170%	4.27	0.76	2.8		500	808	1.598%	170%	21.95	3.89	255.6
Jun-08	8,950	90	2.794%	150%	3.77	0.67	2.5		500	808	1.598%	150%	19.37	3.43	225.6
Jul-08	8,950	90	2.794%	40%	1.01	0.18	0.7		500	808	1.598%	40%	5.17	0.92	60.2
Aug-08	8,950	90	2.794%	60%	1.51	0.27	1.0		500	808	1.598%	60%	7.75	1.37	90.2
Sep-08	8,950	90	2.794%	150%	3.77	0.67	2.5		500	808	1.598%	150%	19.37	3.43	225.6
Oct-08	8,950	90	2.794%	75%	1.89	0.33	1.2		500	808	1.598%	75%	9.69	1.72	112.8
Nov-08	2,238	90	0.922%	75%	0.62	0.11	1.6		125	808	0.527%	75%	3.20	0.57	148.9
Dec-08	2,238	90	0.922%	100%	0.83	0.15	2.2		125	808	0.527%	100%	4.26	0.76	198.5
Jan-09	175	0	0.000%	60%	0.00	0.00	0.0		125	600	0.653%	60%	2.35	0.42	109.5
Feb-09	175	0	0.000%	75%	0.00	0.00	0.0		125	600	0.653%	75%	2.94	0.52	136.9
Mar-09	175	0	0.000%	70%	0.00	0.00	0.0		125	600	0.653%	70%	2.74	0.49	127.8
Apr-09	175	0	0.000%	175%	0.00	0.00	0.0		125	600	0.653%	175%	6.86	1.22	319.4
May-09	700	0	0.000%	170%	0.00	0.00	0.0		500	600	1.979%	170%	20.19	3.58	235.1
Jun-09	700	0	0.000%	150%	0.00	0.00	0.0		500	600	1.979%	150%	17.81	3.16	207.4
Jul-09	700	0	0.000%	40%	0.00	0.00	0.0		500	600	1.979%	40%	4.75	0.84	55.3
Aug-09	700	0	0.000%	60%	0.00	0.00	0.0		500	600	1.979%	60%	7.13	1.26	83.0
Sep-09	700	0	0.000%	150%	0.00	0.00	0.0		500	600	1.979%	150%	17.81	3.16	207.4
Oct-09	700	0	0.000%	75%	0.00	0.00	0.0		500	600	1.979%	75%	8.91	1.58	103.7
Nov-09	175	0	0.000%	75%	0.00	0.00	0.0		125	600	0.653%	75%	2.94	0.52	136.9
Dec-09	175	0	0.000%	100%	0.00	0.00	0.0		125	600	0.653%	100%	3.92	0.69	182.5
Jan-10	175	0	0.000%	60%	0.00	0.00	0.0		125	183	0.745%	60%	0.82	0.15	38.2
Feb-10	175	0	0.000%	75%	0.00	0.00	0.0		125	183	0.745%	75%	1.02	0.18	47.7
Mar-10	175	0	0.000%	70%	0.00	0.00	0.0		125	183	0.745%	70%	0.96	0.17	44.5
Apr-10	175	0	0.000%	175%	0.00	0.00	0.0		125	183	0.745%	175%	2.39	0.42	111.3
May-10	700	0	0.000%	170%	0.00	0.00	0.0		500	183	2.256%	170%	7.03	1.25	81.9
Jun-10	700	0	0.000%	150%	0.00	0.00	0.0		500	183	2.256%	150%	6.21	1.10	72.3
Jul-10	700	0	0.000%	40%	0.00	0.00	0.0		500	183	2.256%	40%	1.65	0.29	19.3
Aug-10	700	0	0.000%	60%	0.00	0.00	0.0		500	183	2.256%	60%	2.48	0.44	28.9
Sep-10	700	0	0.000%	150%	0.00	0.00	0.0		500	183	2.256%	150%	6.21	1.10	72.3
Oct-10	700	0	0.000%	75%	0.00	0.00	0.0		500	183	2.256%	75%	3.10	0.55	36.1
Nov-10	175	0	0.000%	75%	0.00	0.00	0.0		125	183	0.745%	75%	1.02	0.18	47.7
Dec-10	175	0	0.000%	100%	0.00	0.00	0.0		125	183	0.745%	100%	1.37	0.24	63.6
Jan-11	175	0	0.000%	60%	0.00	0.00	0.0		125	23	0.922%	60%	0.13	0.02	6.0
Feb-11	175	0	0.000%	75%	0.00	0.00	0.0		125	23	0.922%	75%	0.16	0.03	7.5
Mar-11	175	0	0.000%	70%	0.00	0.00	0.0		125	23	0.922%	70%	0.15	0.03	7.0
Apr-11	175	0	0.000%	175%	0.00	0.00	0.0		125	23	0.922%	175%	0.38	0.07	17.5
May-11	700	0	0.000%	170%	0.00	0.00	0.0		500	23	2.794%	170%	1.11	0.20	12.9
Jun-11	700	0	0.000%	150%	0.00	0.00	0.0		500	23	2.794%	150%	0.98	0.17	11.4
Jul-11	700	0	0.000%	40%	0.00	0.00	0.0		500	23	2.794%	40%	0.26	0.05	3.0
Aug-11	700	0	0.000%	60%	0.00	0.00	0.0		500	23	2.794%	60%	0.39	0.07	4.6
Sep-11	700	0	0.000%	150%	0.00	0.00	0.0		500	23	2.794%	150%	0.98	0.17	11.4
Oct-11	700	0	0.000%	75%	0.00	0.00	0.0		500	23	2.794%	75%	0.49	0.09	5.7

	UNDERGROUND MINES A418/A154							SURFACE MINE A21						
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)
Jun-07	8,200	33	2.94%	150%	1.43	0.25	1.0	0	0	0.00%	150%	0.00	0.00	0.0
Jul-07	8,200	33	2.94%	40%	0.38	0.07	0.3	0	0	0.00%	40%	0.00	0.00	0.0
Aug-07	8,200	33	2.94%	60%	0.57	0.10	0.4	0	0	0.00%	60%	0.00	0.00	0.0
Sep-07	8,200	33	2.94%	150%	1.43	0.25	1.0	0	0	0.00%	150%	0.00	0.00	0.0
Oct-07	8,200	33	2.94%	75%	0.72	0.13	0.5	0	0	0.00%	75%	0.00	0.00	0.0
Nov-07	820	33	0.74%	75%	0.18	0.03	1.3	0	0	0.00%	75%	0.00	0.00	0.0
Dec-07	820	33	0.74%	100%	0.24	0.04	1.7	0	0	0.00%	100%	0.00	0.00	0.0
Jan-08	2,460	28	0.74%	60%	0.12	0.02	0.3	0	0	0.00%	60%	0.00	0.00	0.0
Feb-08	2,460	28	0.74%	75%	0.16	0.03	0.4	0	0	0.00%	75%	0.00	0.00	0.0
Mar-08	2,460	28	0.74%	70%	0.15	0.03	0.3	0	0	0.00%	70%	0.00	0.00	0.0
Apr-08	2,460	28	0.74%	175%	0.36	0.06	0.9	0	0	0.00%	175%	0.00	0.00	0.0
May-08	24,600	28	2.94%	170%	1.42	0.25	0.3	0	0	0.00%	170%	0.00	0.00	0.0
Jun-08	24,600	28	2.94%	150%	1.25	0.22	0.3	0	0	0.00%	150%	0.00	0.00	0.0
Jul-08	24,600	28	2.94%	40%	0.33	0.06	0.1	0	0	0.00%	40%	0.00	0.00	0.0
Aug-08	24,600	28	2.94%	60%	0.50	0.09	0.1	0	0	0.00%	60%	0.00	0.00	0.0
Sep-08	24,600	28	2.94%	150%	1.25	0.22	0.3	0	0	0.00%	150%	0.00	0.00	0.0
Oct-08	24,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0
Nov-08	2,460	28	0.74%	75%	0.16	0.03	0.4	0	0	0.00%	75%	0.00	0.00	0.0
Dec-08	2,460	28	0.74%	100%	0.21	0.04	0.5	0	0	0.00%	100%	0.00	0.00	0.0
Jan-09	4,090	18	0.74%	60%	0.08	0.01	0.1	0	0	0.00%	60%	0.00	0.00	0.0
Feb-09	4,090	18	0.74%	75%	0.10	0.02	0.1	0	0	0.00%	75%	0.00	0.00	0.0
Mar-09	4,090	18	0.74%	70%	0.09	0.02	0.1	0	0	0.00%	70%	0.00	0.00	0.0
Apr-09	4,090	18	0.74%	175%	0.23	0.04	0.3	0	0	0.00%	175%	0.00	0.00	0.0
May-09	40,900	18	2.94%	170%	0.87	0.16	0.1	0	0	0.00%	170%	0.00	0.00	0.0
Jun-09	40,900	18	2.94%	150%	0.77	0.14	0.1	0	0	0.00%	150%	0.00	0.00	0.0
Jul-09	40,900	18	2.94%	40%	0.21	0.04	0.0	0	0	0.00%	40%	0.00	0.00	0.0
Aug-09	40,900	18	2.94%	60%	0.31	0.05	0.0	0	0	0.00%	60%	0.00	0.00	0.0
Sep-09	40,900	18	2.94%	150%	0.77	0.14	0.1	0	0	0.00%	150%	0.00	0.00	0.0
Oct-09	40,900	18	2.94%	75%	0.39	0.07	0.1	0	0	0.00%	75%	0.00	0.00	0.0
Nov-09	4,090	18	0.74%	75%	0.10	0.02	0.1	0	0	0.00%	75%	0.00	0.00	0.0
Dec-09	4,090	18	0.74%	100%	0.13	0.02	0.2	0	0	0.00%	100%	0.00	0.00	0.0
Jan-10	3,920	11	0.74%	60%	0.05	0.01	0.1	0	0	0.00%	60%	0.00	0.00	0.0
Feb-10	3,920	11	0.74%	75%	0.06	0.01	0.1	0	0	0.00%	75%	0.00	0.00	0.0
Mar-10	3,920	11	0.74%	70%	0.06	0.01	0.1	0	0	0.00%	70%	0.00	0.00	0.0
Apr-10	3,920	11	0.74%	175%	0.14	0.02	0.2	0	0	0.00%	175%	0.00	0.00	0.0
May-10	39,200	11	2.94%	170%	0.55	0.10	0.1	0	0	0.00%	170%	0.00	0.00	0.0
Jun-10	39,200	11	2.94%	150%	0.48	0.09	0.1	0	0	0.00%	150%	0.00	0.00	0.0
Jul-10	39,200	11	2.94%	40%	0.13	0.02	0.0	0	0	0.00%	40%	0.00	0.00	0.0
Aug-10	39,200	11	2.94%	60%	0.19	0.03	0.0	0	0	0.00%	60%	0.00	0.00	0.0
Sep-10	39,200	11	2.94%	150%	0.48	0.09	0.1	0	0	0.00%	150%	0.00	0.00	0.0
Oct-10	39,200	11	2.94%	75%	0.24	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0
Nov-10	3,920	11	0.74%	75%	0.06	0.01	0.1	0	0	0.00%	75%	0.00	0.00	0.0
Dec-10	3,920	11	0.74%	100%	0.08	0.01	0.1	0	0	0.00%	100%	0.00	0.00	0.0
Jan-11	3,740	33	0.74%	60%	0.14	0.03	0.2	0	0	0.00%	60%	0.00	0.00	0.0
Feb-11	3,740	33	0.74%	75%	0.18	0.03	0.3	0	0	0.00%	75%	0.00	0.00	0.0
Mar-11	3,740	33	0.74%	70%	0.17	0.03	0.3	0	0	0.00%	70%	0.00	0.00	0.0
Apr-11	3,740	33	0.74%	175%	0.42	0.07	0.7	0	0	0.00%	175%	0.00	0.00	0.0
May-11	37,400	33	2.94%	170%	1.62	0.29	0.3	0	0	0.00%	170%	0.00	0.00	0.0
Jun-11	37,400	33	2.94%	150%	1.43	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0
Jul-11	37,400	33	2.94%	40%	0.38	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0
Aug-11	37,400	33	2.94%	60%	0.57	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0
Sep-11	37,400	33	2.94%	150%	1.43	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0
Oct-11	37,400	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0

	NORTH INLET																	
Date	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Jun-07	1.25	25900	2.04	45000	25,900	3.55	4.43	4.27	3.0	5.7	2.8	2.20	3.50	2.80	6.16	5.40	8.85	
Jul-07	1.25	25900	2.04	45000	25,900	2.80	3.50	1.14	3.0	1.6	0.8	0.63	1.00	0.80	3.10	3.08	6.50	
Aug-07	1.25	25900	2.04	45000	25,900	0.80	1.00	1.71	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-07	1.25	25900	2.04	45000	25,900	0.00	0.00	4.27	3.0	1.3	0.6	0.49	0.78	0.62	2.70	2.75	6.10	
Oct-07	1.25	25900	2.04	45000	25,900	0.62	0.78	2.13	2.0	0.9	0.4	0.35	0.56	0.45	2.25	2.37	5.62	
Nov-07	1.25	25900	2.04	45000	25,900	0.45	0.56	0.69	0.0	1.3	0.6	0.48	0.77	0.62	2.68	2.73	6.08	
Dec-07	1.25	25900	2.04	45000	25,900	0.62	0.77	0.93	0.0	1.7	0.8	0.66	1.04	0.83	3.16	3.13	6.55	
Jan-08	1.25	34050	2.29	45000	34,050	0.83	1.04	0.56	0.0	1.6	0.7	0.73	0.88	0.70	2.88	2.90	6.28	
Feb-08	1.25	34050	2.29	45000	34,050	0.70	0.88	0.70	0.0	1.6	0.7	0.72	0.86	0.69	2.86	2.88	6.26	
Mar-08	1.25	34050	2.29	45000	34,050	0.69	0.86	0.66	0.0	1.5	0.7	0.69	0.83	0.67	2.80	2.83	6.20	
Apr-08	1.25	34050	2.29	45000	34,050	0.67	0.83	1.64	1.0	1.5	0.6	0.67	0.81	0.65	2.75	2.79	6.16	
May-08	1.25	#####	9.88	45000	283,800	0.65	0.81	4.90	2.0	3.7	0.4	3.24	0.47	0.38	2.04	2.19	5.38	
Jun-08	1.25	#####	9.88	45000	283,800	0.38	0.47	4.32	3.0	1.8	0.2	1.56	0.23	0.18	1.37	1.58	4.50	
Jul-08	1.25	#####	9.88	45000	283,800	0.18	0.23	1.15	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-08	1.25	#####	9.88	45000	283,800	0.00	0.00	1.73	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-08	1.25	#####	9.88	45000	283,800	0.00	0.00	4.32	3.0	1.3	0.1	1.16	0.17	0.13	1.16	1.38	4.17	
Oct-08	1.25	#####	9.88	45000	283,800	0.13	0.17	2.16	2.0	0.3	0.0	0.29	0.04	0.03	0.54	0.74	2.95	
Nov-08	1.25	34050	2.29	45000	34,050	0.03	0.04	0.70	0.0	0.7	0.3	0.34	0.41	0.33	1.89	2.05	5.20	
Dec-08	1.25	34050	2.29	45000	34,050	0.33	0.41	0.94	0.0	1.3	0.6	0.61	0.74	0.59	2.62	2.68	6.02	
Jan-09	1.25	42100	2.53	60000	42,100	0.59	0.74	0.43	0.0	1.2	0.5	0.59	0.58	0.46	2.29	2.40	5.66	
Feb-09	1.25	42100	2.53	60000	42,100	0.46	0.58	0.54	0.0	1.1	0.4	0.56	0.55	0.44	2.23	2.35	5.60	
Mar-09	1.25	42100	2.53	60000	42,100	0.44	0.55	0.50	0.0	1.1	0.4	0.53	0.52	0.42	2.16	2.29	5.52	
Apr-09	1.25	42100	2.53	60000	42,100	0.42	0.52	1.26	1.0	0.8	0.3	0.39	0.38	0.31	1.83	2.00	5.12	
May-09	1.25	#####	13.84	60000	413,800	0.31	0.38	3.73	2.0	2.1	0.2	1.92	0.19	0.15	1.25	1.46	4.31	
Jun-09	1.25	#####	13.84	60000	413,800	0.15	0.19	3.29	3.0	0.5	0.0	0.44	0.04	0.04	0.55	0.75	2.99	
Jul-09	1.25	#####	13.84	60000	413,800	0.04	0.04	0.88	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-09	1.25	#####	13.84	60000	413,800	0.00	0.00	1.32	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-09	1.25	#####	13.84	60000	413,800	0.00	0.00	3.29	3.0	0.3	0.0	0.27	0.03	0.02	0.42	0.60	2.64	
Oct-09	1.25	#####	13.84	60000	413,800	0.02	0.03	1.65	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-09	1.25	42100	2.53	60000	42,100	0.00	0.00	0.54	0.0	0.5	0.2	0.27	0.27	0.21	1.49	1.69	4.68	
Dec-09	1.25	42100	2.53	60000	42,100	0.21	0.27	0.72	0.0	1.0	0.4	0.50	0.49	0.39	2.08	2.22	5.43	
Jan-10	1.25	40400	2.48	60000	40,400	0.39	0.49	0.15	0.0	0.6	0.3	0.32	0.32	0.26	1.66	1.85	4.91	
Feb-10	1.25	40400	2.48	60000	40,400	0.26	0.32	0.19	0.0	0.5	0.2	0.26	0.26	0.21	1.47	1.68	4.65	
Mar-10	1.25	40400	2.48	60000	40,400	0.21	0.26	0.18	0.0	0.4	0.2	0.22	0.22	0.18	1.35	1.56	4.47	
Apr-10	1.25	40400	2.48	60000	40,400	0.18	0.22	0.45	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-10	1.25	#####	13.32	60000	396,800	0.00	0.00	1.34	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-10	1.25	#####	13.32	60000	396,800	0.00	0.00	1.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-10	1.25	#####	13.32	60000	396,800	0.00	0.00	0.32	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-10	1.25	#####	13.32	60000	396,800	0.00	0.00	0.47	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-10	1.25	#####	13.32	60000	396,800	0.00	0.00	1.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-10	1.25	#####	13.32	60000	396,800	0.00	0.00	0.59	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-10	1.25	40400	2.48	60000	40,400	0.00	0.00	0.19	0.0	0.2	0.1	0.10	0.10	0.08	0.86	1.08	3.64	
Dec-10	1.25	40400	2.48	60000	40,400	0.08	0.10	0.26	0.0	0.4	0.1	0.18	0.18	0.14	1.20	1.41	4.24	
Jan-11	1.25	38600	2.42	60000	38,600	0.14	0.18	0.05	0.0	0.2	0.1	0.11	0.12	0.09	0.95	1.17	3.81	
Feb-11	1.25	38600	2.42	60000	38,600	0.09	0.12	0.06	0.0	0.2	0.1	0.09	0.09	0.07	0.83	1.05	3.59	
Mar-11	1.25	38600	2.42	60000	38,600	0.07	0.09	0.06	0.0	0.1	0.1	0.07	0.08	0.06	0.75	0.96	3.43	
Apr-11	1.25	38600	2.42	60000	38,600	0.06	0.09	0.14	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-11	1.25	#####	12.77	60000	378,800	0.00	0.00	0.48	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-11	1.25	#####	12.77	60000	378,800	0.00	0.00	0.43	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-11	1.25	#####	12.77	60000	378,800	0.00	0.00	0.11	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-11	1.25	#####	12.77	60000	378,800	0.00	0.00	0.17	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-11	1.25	#####	12.77	60000	378,800	0.00	0.00	0.43	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-11	1.25	#####	12.77	60000	378,800	0.00	0.00	0.21	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Temporal Segregation plus Snowmaking

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Nov-11	175	0	0.000%	75%	0.00	0.00	0.0		125	23	0.922%	75%	0.16	0.03	7.5	3,740	33	0.74%	75%	0.18	0.03	0.3	0	0	0.00%	75%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.00	0.00	0.06	0.0	0.1	0.0	0.03	0.03	0.02	0.46	0.65	2.75	
Dec-11	175	0	0.000%	100%	0.00	0.00	0.0		125	23	0.922%	100%	0.22	0.04	10.0	3,740	33	0.74%	100%	0.24	0.04	0.4	0	0	0.00%	100%	0.00	0.00	0.0	1.25	38600	2.42	60000	38,600	0.02	0.03	0.08	0.0	0.1	0.0	0.05	0.06	0.05	0.64	0.85	3.20	
Jan-12	175	0	0.000%	60%	0.00	0.00	0.0		125	1	0.922%	60%	0.01	0.00	0.3	3,735	30	0.74%	60%	0.13	0.02	0.2	2,100	190	0.92%	60%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.05	0.06	0.34	0.0	0.4	0.2	0.20	0.20	0.16	1.27	1.48	4.35	
Feb-12	175	0	0.000%	75%	0.00	0.00	0.0		125	1	0.922%	75%	0.01	0.00	0.4	3,735	30	0.74%	75%	0.17	0.03	0.3	2,100	190	0.92%	75%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.16	0.20	0.34	0.0	0.5	0.2	0.27	0.27	0.22	1.51	1.71	4.70	
Mar-12	175	0	0.000%	70%	0.00	0.00	0.0		125	1	0.922%	70%	0.01	0.00	0.4	3,735	30	0.74%	70%	0.15	0.03	0.2	2,100	190	0.92%	70%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.22	0.27	0.34	0.0	0.6	0.2	0.30	0.31	0.25	1.62	1.81	4.85	
Apr-12	175	0	0.000%	175%	0.00	0.00	0.0		125	1	0.922%	175%	0.02	0.00	0.9	3,735	30	0.74%	175%	0.39	0.07	0.6	2,100	190	0.92%	175%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.25	0.31	0.38	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-12	700	0	0.000%	170%	0.00	0.00	0.0		500	1	2.794%	170%	0.06	0.01	0.6	37,350	30	2.94%	170%	1.50	0.27	0.2	2,100	190	0.92%	170%	1.76	0.31	4.9	1.25	#####	12.82	60000	380,400	0.00	0.00	0.59	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-12	700	0	0.000%	150%	0.00	0.00	0.0		500	1	2.794%	150%	0.05	0.01	0.6	37,350	30	2.94%	150%	1.32	0.23	0.2	2,100	190	0.92%	150%	1.76	0.31	4.9	1.25	#####	12.82	60000	380,400	0.00	0.00	0.55	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-12	700	0	0.000%	40%	0.00	0.00	0.0		500	1	2.794%	40%	0.01	0.00	0.2	37,350	30	2.94%	40%	0.35	0.06	0.1	2,100	190	0.92%	40%	1.76	0.31	4.9	1.25	#####	12.82	60000	380,400	0.00	0.00	0.38	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-12	700	0	0.000%	60%	0.00	0.00	0.0		500	1	2.794%	60%	0.02	0.00	0.2	37,350	30	2.94%	60%	0.53	0.09	0.1	2,100	190	0.92%	60%	1.76	0.31	4.9	1.25	#####	12.82	60000	380,400	0.00	0.00	0.41	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-12	700	0	0.000%	150%	0.00	0.00	0.0		500	1	2.794%	150%	0.05	0.01	0.6	37,350	30	2.94%	150%	1.32	0.23	0.2	2,100	190	0.92%	150%	1.76	0.31	4.9	1.25	#####	12.82	60000	380,400	0.00	0.00	0.55	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-12	700	0	0.000%	75%	0.00	0.00	0.0		500	1	2.794%	75%	0.02	0.00	0.3	37,350	30	2.94%	75%	0.66	0.12	0.1	2,100	190	0.92%	75%	1.76	0.31	4.9	1.25	#####	12.82	60000	380,400	0.00	0.00	0.43	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-12	175	0	0.000%	75%	0.00	0.00	0.0		125	1	0.922%	75%	0.01	0.00	0.4	3,735	30	0.74%	75%	0.17	0.03	0.3	2,100	190	0.92%	75%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.00	0.00	0.34	0.0	0.3	0.1	0.17	0.17	0.14	1.18	1.39	4.20	
Dec-12	175	0	0.000%	100%	0.00	0.00	0.0		125	1	0.922%	100%	0.01	0.00	0.5	3,735	30	0.74%	100%	0.22	0.04	0.3	2,100	190	0.92%	100%	1.76	0.31	4.9	1.25	40650	2.49	60000	40,650	0.14	0.17	0.35	0.0	0.5	0.2	0.26	0.26	0.21	1.49	1.69	4.67	
Jan-13	175	0	0.000%	60%	0.00	0.00	0.0		125	0	0.000%	60%	0.00	0.00	0.0	3,730	17	0.74%	60%	0.07	0.01	0.1	4,500	376	1.60%	60%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.21	0.26	1.08	0.0	1.3	0.5	0.69	0.66	0.52	2.45	2.54	5.85	
Feb-13	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	3,730	17	0.74%	75%	0.09	0.02	0.1	4,500	376	1.60%	75%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.52	0.66	1.08	0.0	1.7	0.7	0.89	0.85	0.68	2.83	2.86	6.23	
Mar-13	175	0	0.000%	70%	0.00	0.00	0.0		125	0	0.000%	70%	0.00	0.00	0.0	3,730	17	0.74%	70%	0.09	0.02	0.1	4,500	376	1.60%	70%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.68	0.85	1.08	0.0	1.9	0.8	0.99	0.94	0.75	3.00	2.99	6.40	
Apr-13	175	0	0.000%	175%	0.00	0.00	0.0		125	0	0.000%	175%	0.00	0.00	0.0	3,730	17	0.74%	175%	0.21	0.04	0.3	4,500	376	1.60%	175%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.75	0.94	1.10	1.0	1.0	0.4	0.53	0.51	0.41	2.14	2.27	5.50	
May-13	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	37,300	17	2.94%	170%	0.83	0.15	0.1	4,500	376	1.60%	170%	6.00	1.06	7.8	1.25	#####	12.88	60000	382,300	0.41	0.51	1.21	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-13	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	37,300	17	2.94%	150%	0.74	0.13	0.1	4,500	376	1.60%	150%	6.00	1.06	7.8	1.25	#####	12.88	60000	382,300	0.00	0.00	1.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-13	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	37,300	17	2.94%	40%	0.20	0.03	0.0	4,500	376	1.60%	40%	6.00	1.06	7.8	1.25	#####	12.88	60000	382,300	0.00	0.00	1.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-13	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	37,300	17	2.94%	60%	0.29	0.05	0.0	4,500	376	1.60%	60%	6.00	1.06	7.8	1.25	#####	12.88	60000	382,300	0.00	0.00	1.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-13	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	37,300	17	2.94%	150%	0.74	0.13	0.1	4,500	376	1.60%	150%	6.00	1.06	7.8	1.25	#####	12.88	60000	382,300	0.00	0.00	1.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-13	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	37,300	17	2.94%	75%	0.37	0.07	0.1	4,500	376	1.60%	75%	6.00	1.06	7.8	1.25	#####	12.88	60000	382,300	0.00	0.00	1.13	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-13	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	3,730	17	0.74%	75%	0.09	0.02	0.1	4,500	376	1.60%	75%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.00	0.00	1.08	0.0	1.1	0.4	0.55	0.53	0.42	2.18	2.31	5.54	
Dec-13	175	0	0.000%	100%	0.00	0.00	0.0		125	0	0.000%	100%	0.00	0.00	0.0	3,730	17	0.74%	100%	0.12	0.02	0.2	4,500	376	1.60%	100%	6.00	1.06	7.8	1.25	43000	2.56	60000	43,000	0.42	0.53	1.09	0.0	1.6	0.6	0.83	0.79	0.63	2.72	2.76	6.12	
Jan-14	175	0	0.000%	60%	0.00	0.00	0.0		125	0	0.000%	60%	0.00	0.00	0.0	3,895	21	0.74%	60%	0.09	0.02	0.1	7,200	468	1.98%	60%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.63	0.79	1.66	0.0	2.4	0.9	1.31	1.14	0.91	3.32	3.26	6.70	
Feb-14	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	3,895	21	0.74%	75%	0.11	0.02	0.2	7,200	468	1.98%	75%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.91	1.14	1.66	0.0	2.8	1.0	1.50	1.30	1.04	3.57	3.46	6.93	
Mar-14	175	0	0.000%	70%	0.00	0.00	0.0		125	0	0.000%	70%	0.00	0.00	0.0	3,895	21	0.74%	70%	0.11	0.02	0.2	7,200	468	1.98%	70%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	1.04	1.30	1.66	0.0	3.0	1.1	1.58	1.37	1.10	3.69	3.55	7.02	
Apr-14	175	0	0.000%	175%	0.00	0.00	0.0		125	0	0.000%	175%	0.00	0.00	0.0	3,895	21	0.74%	175%	0.27	0.05	0.4	7,200	468	1.98%	175%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	1.10	1.37	1.69	1.0	2.1	0.8	1.10	0.96	0.77	3.02	3.02	6.42	
May-14	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	38,950	21	2.94%	170%	1.04	0.18	0.2	7,200	468	1.98%	170%	9.25	1.64	7.5	1.25	#####	13.46	60000	401,500	0.77	0.96	1.82	2.0	0.8	0.1	0.71	0.07	0.06	0.73	0.94	3.39	
Jun-14	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,950	21	2.94%	150%	0.92	0.16	0.1	7,200	468	1.98%	150%	9.25	1.64	7.5	1.25	#####	13.46	60000	401,500	0.06	0.07	1.80	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-14	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	38,950	21	2.94%	40%	0.25	0.04	0.0	7,200	468	1.98%	40%	9.25	1.64	7.5	1.25	#####	13.46	60000	401,500	0.00	0.00	1.68	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-14	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,950	21	2.94%	60%	0.37	0.07	0.1	7,200	468	1.98%	60%	9.25	1.64	7.5	1.25	#####	13.46	60000	401,500	0.00	0.00	1.70	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-14	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,950	21	2.94%	150%	0.92	0.16	0.1	7,200	468	1.98%	150%	9.25	1.64	7.5	1.25	#####	13.46	60000	401,500	0.00	0.00	1.80	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-14	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,950	21	2.94%	75%	0.46	0.08	0.1	7,200	468	1.98%	75%	9.25	1.64	7.5	1.25	#####	13.46	60000	401,500	0.00	0.00	1.72	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-14	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	3,895	21	0.74%	75%	0.11	0.02	0.2	7,200	468	1.98%	75%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.00	0.00	1.66	0.0	1.7	0.6	0.89	0.77	0.62	2.68	2.74	6.09	
Dec-14	175	0	0.000%	100%	0.00	0.00	0.0		125	0	0.000%	100%	0.00	0.00	0.0	3,895	21	0.74%	100%	0.15	0.03	0.2	7,200	468	1.98%	100%	9.25	1.64	7.5	1.25	47350	2.69	60000	47,350	0.62	0.77	1.67	0.0	2.4	0.9	1.31	1.13	0.91	3.32	3.25	6.70	
Jan-15	175	0	0.000%	60%	0.00	0.00	0.0		125	0	0.000%	60%	0.00	0.00	0.0	4,060	28	0.74%	60%	0.12	0.02	0.2	0	0	0.00%	60%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.91	1.13	0.02	0.0	1.2	0.5	0.58	0.57	0.46	2.28	2.39	5.66	
Feb-15	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	4,060	28	0.74%	75%	0.16	0.03	0.2	0	0	0.00%	75%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.46	0.57	0.03	0.0	0.6	0.2	0.30	0.30	0.24	1.59	1.78	4.81	
Mar-15	175	0	0.000%	70%	0.00	0.00	0.0		125	0	0.000%	70%	0.00	0.00	0.0	4,060	28	0.74%	70%	0.15	0.03	0.2	0	0	0.00%	70%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.24	0.30	0.03	0.0	0.3	0.1	0.16	0.16	0.13	1.13	1.35	4.13	
Apr-15	175	0	0.000%	175%	0.00	0.00	0.0		125	0	0.000%	175%	0.00	0.00	0.0	4,060	28	0.74%	175%	0.36	0.06	0.5	0	0	0.00%	175%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.13	0.16	0.06	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-15	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	40,600	28	2.94%	170%	1.42	0.25	0.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	#####	13.75	60000	410,800	0.00	0.00	0.25	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-15	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	40,600	28	2.94%	150%	1.25	0.22	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	#####	13.75	60000	410,800	0.00	0.00	0.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-15	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	40,600	28	2.94%	40%	0.33	0.06	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	#####	13.75	60000	410,800	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-15	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	40,600	28	2.94%	60%	0.50	0.09	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	#####	13.75	60000	410,800	0.00	0.00	0.09	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-15	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	40,600	28	2.94%	150%	1.25	0.22	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	#####	13.75	60000	410,800	0.00	0.00	0.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-15	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	40,600	28	2.94%	75%	0.62	0.11	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	#####	13.75	60000	410,800	0.00	0.00	0.11	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-15	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	4,060	28	0.74%	75%	0.16	0.03	0.2	0	0	0.00%	75%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.00	0.00	0.03	0.0	0.0	0.0	0.01	0.01	0.01	0.29	0.45	2.25	
Dec-15	175	0	0.000%	100%	0.00	0.00	0.0		125	0	0.000%	100%	0.00	0.00	0.0	4,060	28	0.74%	100%	0.21	0.04	0.3	0	0	0.00%	100%	0.00	0.00	0.0	1.25	41800	2.52	60000	41,800	0.01	0.01	0.04	0.0	0.1	0.0	0.03	0.03	0.02	0.41	0.59	2.61	
Jan-16	175	0	0.000%	60%	0.00	0.00	0.0		125	0	0.000%	60%	0.00	0.00	0.0	4,000	31	0.74%	60%	0.14	0.02	0.2	0	0	0.00%	60%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.02	0.03	0.02	0.0	0.0	0.0	0.02	0.02	0.02	0.40	0.58	2.59	
Feb-16	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	4,000	31	0.74%	75%	0.17	0.03	0.2	0	0	0.00%	75%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.02	0.02	0.03	0.0	0.1	0.0	0.03	0.03	0.02	0.43	0.61	2.66	
Mar-16	175	0	0.000%	70%	0.00	0.00	0.0		125	0	0.000%	70%	0.00	0.00	0.0	4,000	31	0.74%	70%	0.16	0.03	0.2	0	0	0.00%	70%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.02	0.03	0.03	0.0	0.1	0.0	0.03	0.03	0.02	0.43	0.61	2.67	

WLWB Ammonia Model - Temporal Segregation plus Snowmaking

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Apr-16	175	0	0.000%	175%	0.00	0.00	0.0		125	0	0.000%	175%	0.00	0.00	0.0	4,000	31	0.74%	175%	0.40	0.07	0.6	0	0	0.00%	175%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.02	0.03	0.07	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-16	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	40,000	31	2.94%	170%	1.54	0.27	0.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	#####	13.56	60000	404,800	0.00	0.00	0.27	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-16	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	40,000	31	2.94%	150%	1.36	0.24	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	#####	13.56	60000	404,800	0.00	0.00	0.24	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-16	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	40,000	31	2.94%	40%	0.36	0.06	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	#####	13.56	60000	404,800	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-16	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	40,000	31	2.94%	60%	0.54	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	#####	13.56	60000	404,800	0.00	0.00	0.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-16	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	40,000	31	2.94%	150%	1.36	0.24	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	#####	13.56	60000	404,800	0.00	0.00	0.24	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-16	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	40,000	31	2.94%	75%	0.68	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	#####	13.56	60000	404,800	0.00	0.00	0.12	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-16	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	4,000	31	0.74%	75%	0.17	0.03	0.2	0	0	0.00%	75%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.00	0.00	0.03	0.0	0.0	0.0	0.02	0.02	0.01	0.31	0.47	2.30	
Dec-16	175	0	0.000%	100%	0.00	0.00	0.0		125	0	0.000%	100%	0.00	0.00	0.0	4,000	31	0.74%	100%	0.23	0.04	0.3	0	0	0.00%	100%	0.00	0.00	0.0	1.25	41200	2.50	60000	41,200	0.01	0.02	0.04	0.0	0.1	0.0	0.03	0.03	0.02	0.43	0.61	2.67	
Jan-17	175	0	0.000%	60%	0.00	0.00	0.0		125	0	0.000%	60%	0.00	0.00	0.0	3,950	38	0.74%	60%	0.17	0.03	0.2	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.02	0.03	0.03	0.0	0.1	0.0	0.03	0.03	0.02	0.44	0.62	2.69	
Feb-17	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	3,950	38	0.74%	75%	0.21	0.04	0.3	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.02	0.03	0.04	0.0	0.1	0.0	0.03	0.03	0.03	0.47	0.66	2.79	
Mar-17	175	0	0.000%	70%	0.00	0.00	0.0		125	0	0.000%	70%	0.00	0.00	0.0	3,950	38	0.74%	70%	0.19	0.03	0.3	0	0	0.00%	70%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.03	0.03	0.03	0.0	0.1	0.0	0.03	0.03	0.03	0.48	0.67	2.80	
Apr-17	175	0	0.000%	175%	0.00	0.00	0.0		125	0	0.000%	175%	0.00	0.00	0.0	3,950	38	0.74%	175%	0.48	0.09	0.7	0	0	0.00%	175%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.03	0.03	0.09	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-17	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	39,500	38	2.94%	170%	1.87	0.33	0.3	0	0	0.00%	170%	0.00	0.00	0.0	1.25	#####	13.41	60000	399,800	0.00	0.00	0.33	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-17	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	39,500	38	2.94%	150%	1.65	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	#####	13.41	60000	399,800	0.00	0.00	0.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-17	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	39,500	38	2.94%	40%	0.44	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	#####	13.41	60000	399,800	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-17	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	39,500	38	2.94%	60%	0.66	0.12	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	#####	13.41	60000	399,800	0.00	0.00	0.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-17	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	39,500	38	2.94%	150%	1.65	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	#####	13.41	60000	399,800	0.00	0.00	0.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-17	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	39,500	38	2.94%	75%	0.83	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	#####	13.41	60000	399,800	0.00	0.00	0.15	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-17	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	3,950	38	0.74%	75%	0.21	0.04	0.3	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.00	0.00	0.04	0.0	0.0	0.0	0.02	0.02	0.01	0.34	0.51	2.42	
Dec-17	175	0	0.000%	100%	0.00	0.00	0.0		125	0	0.000%	100%	0.00	0.00	0.0	3,950	38	0.74%	100%	0.28	0.05	0.4	0	0	0.00%	100%	0.00	0.00	0.0	1.25	40700	2.49	60000	40,700	0.01	0.02	0.05	0.0	0.1	0.0	0.03	0.03	0.03	0.48	0.67	2.81	
Jan-18	175	0	0.000%	60%	0.00	0.00	0.0		125	0	0.000%	60%	0.00	0.00	0.0	3,900	37	0.74%	60%	0.16	0.03	0.2	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.03	0.03	0.03	0.0	0.1	0.0	0.03	0.03	0.03	0.46	0.65	2.76	
Feb-18	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	3,900	37	0.74%	75%	0.20	0.04	0.3	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.03	0.03	0.04	0.0	0.1	0.0	0.03	0.03	0.03	0.48	0.67	2.81	
Mar-18	175	0	0.000%	70%	0.00	0.00	0.0		125	0	0.000%	70%	0.00	0.00	0.0	3,900	37	0.74%	70%	0.19	0.03	0.3	0	0	0.00%	70%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.03	0.03	0.03	0.0	0.1	0.0	0.03	0.03	0.03	0.48	0.67	2.81	
Apr-18	175	0	0.000%	175%	0.00	0.00	0.0		125	0	0.000%	175%	0.00	0.00	0.0	3,900	37	0.74%	175%	0.47	0.08	0.7	0	0	0.00%	175%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.03	0.03	0.08	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-18	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	39,000	37	2.94%	170%	1.83	0.32	0.3	0	0	0.00%	170%	0.00	0.00	0.0	1.25	#####	13.26	60000	394,800	0.00	0.00	0.32	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-18	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	39,000	37	2.94%	150%	1.62	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	#####	13.26	60000	394,800	0.00	0.00	0.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-18	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	39,000	37	2.94%	40%	0.43	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	#####	13.26	60000	394,800	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-18	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	39,000	37	2.94%	60%	0.65	0.11	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	#####	13.26	60000	394,800	0.00	0.00	0.11	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-18	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	39,000	37	2.94%	150%	1.62	0.29	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	#####	13.26	60000	394,800	0.00	0.00	0.29	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-18	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	39,000	37	2.94%	75%	0.81	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	#####	13.26	60000	394,800	0.00	0.00	0.14	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-18	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	3,900	37	0.74%	75%	0.20	0.04	0.3	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.00	0.00	0.04	0.0	0.0	0.0	0.02	0.02	0.01	0.34	0.51	2.41	
Dec-18	175	0	0.000%	100%	0.00	0.00	0.0		125	0	0.000%	100%	0.00	0.00	0.0	3,900	37	0.74%	100%	0.27	0.05	0.4	0	0	0.00%	100%	0.00	0.00	0.0	1.25	40200	2.47	60000	40,200	0.01	0.02	0.05	0.0	0.1	0.0	0.03	0.03	0.03	0.48	0.67	2.80	
Jan-19	175	0	0.000%	60%	0.00	0.00	0.0		125	0	0.000%	60%	0.00	0.00	0.0	3,850	33	0.74%	60%	0.14	0.03	0.2	0	0	0.00%	60%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.03	0.03	0.03	0.0	0.1	0.0	0.03	0.03	0.02	0.45	0.63	2.72	
Feb-19	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	3,850	33	0.74%	75%	0.18	0.03	0.3	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.02	0.03	0.03	0.0	0.1	0.0	0.03	0.03	0.03	0.46	0.65	2.76	
Mar-19	175	0	0.000%	70%	0.00	0.00	0.0		125	0	0.000%	70%	0.00	0.00	0.0	3,850	33	0.74%	70%	0.17	0.03	0.3	0	0	0.00%	70%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.03	0.03	0.03	0.0	0.1	0.0	0.03	0.03	0.02	0.46	0.64	2.75	
Apr-19	175	0	0.000%	175%	0.00	0.00	0.0		125	0	0.000%	175%	0.00	0.00	0.0	3,850	33	0.74%	175%	0.42	0.07	0.6	0	0	0.00%	175%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.02	0.03	0.07	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-19	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	38,500	33	2.94%	170%	1.62	0.29	0.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	#####	13.11	60000	389,800	0.00	0.00	0.29	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-19	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,500	33	2.94%	150%	1.43	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	#####	13.11	60000	389,800	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-19	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	38,500	33	2.94%	40%	0.38	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	#####	13.11	60000	389,800	0.00	0.00	0.07	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-19	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,500	33	2.94%	60%	0.57	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	#####	13.11	60000	389,800	0.00	0.00	0.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-19	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,500	33	2.94%	150%	1.43	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	#####	13.11	60000	389,800	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-19	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,500	33	2.94%	75%	0.72	0.13	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	#####	13.11	60000	389,800	0.00	0.00	0.13	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-19	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	3,850	33	0.74%	75%	0.18	0.03	0.3	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.00	0.00	0.03	0.0	0.0	0.0	0.02	0.02	0.01	0.32	0.48	2.34	
Dec-19	175	0	0.000%	100%	0.00	0.00	0.0		125	0	0.000%	100%	0.00	0.00	0.0	3,850	33	0.74%	100%	0.24	0.04	0.4	0	0	0.00%	100%	0.00	0.00	0.0	1.25	39700	2.46	60000	39,700	0.01	0.02	0.04	0.0	0.1	0.0	0.03	0.03	0.02	0.45	0.63	2.72	
Jan-20	175	0	0.000%	60%	0.00	0.00	0.0		125	0	0.000%	60%	0.00	0.00	0.0	4,260	38	0.74%	60%	0.17	0.03	0.2	0	0	0.00%	60%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.02	0.03	0.03	0.0	0.1	0.0	0.03	0.03	0.02	0.44	0.62	2.70	
Feb-20	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	4,260	38	0.74%	75%	0.21	0.04	0.3	0	0	0.00%	75%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.02	0.03	0.04	0.0	0.1	0.0	0.03	0.03	0.03	0.47	0.65	2.77	
Mar-20	175	0	0.000%	70%	0.00	0.00	0.0		125	0	0.000%	70%	0.00	0.00	0.0	4,260	38	0.74%	70%	0.20	0.03	0.3	0	0	0.00%	70%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.03	0.03	0.03	0.0	0.1	0.0	0.03	0.03	0.03	0.47	0.66	2.78	
Apr-20	175	0	0.000%	175%	0.00	0.00	0.0		125	0	0.000%	175%	0.00	0.00	0.0	4,260	38	0.74%	175%	0.49	0.09	0.7	0	0	0.00%	175%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.03	0.03	0.09	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-20	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	42,600	38	2.94%	170%	1.92	0.34	0.3	0	0	0.00%	170%	0.00	0.00	0.0	1.25	#####	14.35	60000	430,800	0.00	0.00	0.34	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-20	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	42,600	38	2.94%	150%	1.69	0.30	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	#####	14.35	60000	430,800	0.00	0.00	0.30	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-20	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	42,600	38	2.94%	40%	0.45	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	#####	14.35	60000	430,800	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-20	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	42,600	38	2.94%	60%	0.68	0.12	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	#####	14.35	60000	430,800	0.00	0.00	0.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Temporal Segregation plus Snowmaking

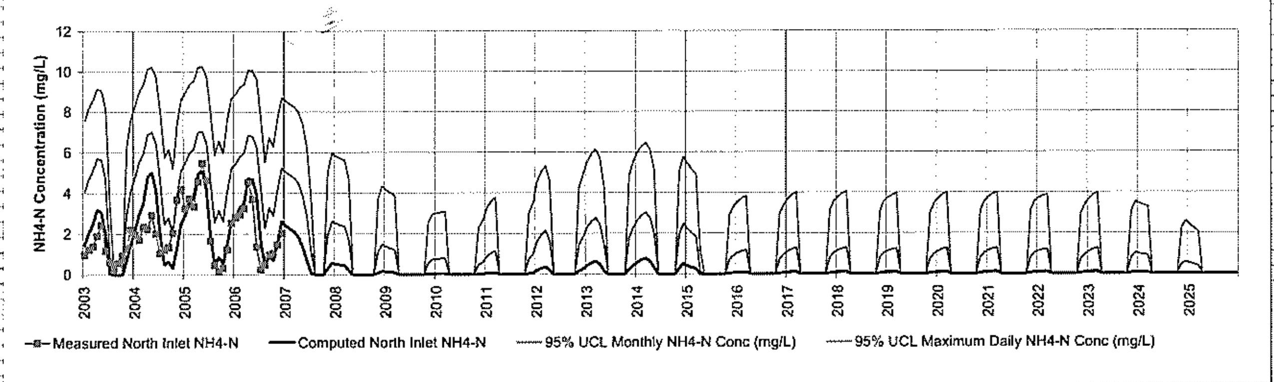
	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Sep-20	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	42,600	38	2.94%	150%	1.69	0.30	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	#####	14.35	60000	430,800	0.00	0.00	0.30	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-20	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	42,600	38	2.94%	75%	0.85	0.15	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	#####	14.35	60000	430,800	0.00	0.00	0.15	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-20	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	4,260	38	0.74%	75%	0.21	0.04	0.3	0	0	0.00%	75%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.00	0.00	0.04	0.0	0.0	0.0	0.02	0.02	0.01	0.34	0.51	2.41	
Dec-20	175	0	0.000%	100%	0.00	0.00	0.0		125	0	0.000%	100%	0.00	0.00	0.0	4,260	38	0.74%	100%	0.28	0.05	0.4	0	0	0.00%	100%	0.00	0.00	0.0	1.25	43800	2.58	60000	43,800	0.01	0.02	0.05	0.0	0.1	0.0	0.04	0.03	0.03	0.47	0.66	2.79	
Jan-21	175	0	0.000%	60%	0.00	0.00	0.0		125	0	0.000%	60%	0.00	0.00	0.0	4,680	40	0.74%	60%	0.18	0.03	0.2	0	0	0.00%	60%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.03	0.03	0.03	0.0	0.1	0.0	0.03	0.03	0.02	0.45	0.63	2.72	
Feb-21	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	4,680	40	0.74%	75%	0.22	0.04	0.3	0	0	0.00%	75%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.02	0.03	0.04	0.0	0.1	0.0	0.04	0.03	0.03	0.46	0.65	2.76	
Mar-21	175	0	0.000%	70%	0.00	0.00	0.0		125	0	0.000%	70%	0.00	0.00	0.0	4,680	40	0.74%	70%	0.21	0.04	0.3	0	0	0.00%	70%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.03	0.03	0.04	0.0	0.1	0.0	0.04	0.03	0.03	0.46	0.65	2.76	
Apr-21	175	0	0.000%	175%	0.00	0.00	0.0		125	0	0.000%	175%	0.00	0.00	0.0	4,680	40	0.74%	175%	0.51	0.09	0.6	0	0	0.00%	175%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.03	0.03	0.09	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-21	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	46,800	40	2.94%	170%	2.00	0.35	0.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	#####	15.63	60000	472,800	0.00	0.00	0.35	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-21	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	46,800	40	2.94%	150%	1.76	0.31	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	#####	15.63	60000	472,800	0.00	0.00	0.31	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-21	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	46,800	40	2.94%	40%	0.47	0.08	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	#####	15.63	60000	472,800	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-21	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	46,800	40	2.94%	60%	0.71	0.13	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	#####	15.63	60000	472,800	0.00	0.00	0.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-21	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	46,800	40	2.94%	150%	1.76	0.31	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	#####	15.63	60000	472,800	0.00	0.00	0.31	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-21	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	46,800	40	2.94%	75%	0.88	0.16	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	#####	15.63	60000	472,800	0.00	0.00	0.16	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-21	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	4,680	40	0.74%	75%	0.22	0.04	0.3	0	0	0.00%	75%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.00	0.00	0.04	0.0	0.0	0.0	0.02	0.02	0.01	0.34	0.50	2.40	
Dec-21	175	0	0.000%	100%	0.00	0.00	0.0		125	0	0.000%	100%	0.00	0.00	0.0	4,680	40	0.74%	100%	0.29	0.05	0.4	0	0	0.00%	100%	0.00	0.00	0.0	1.25	48000	2.71	60000	48,000	0.01	0.02	0.05	0.0	0.1	0.0	0.04	0.03	0.03	0.47	0.66	2.78	
Jan-22	175	0	0.000%	60%	0.00	0.00	0.0		125	0	0.000%	60%	0.00	0.00	0.0	4,220	32	0.74%	60%	0.14	0.02	0.2	0	0	0.00%	60%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.03	0.03	0.02	0.0	0.1	0.0	0.03	0.03	0.02	0.43	0.61	2.67	
Feb-22	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	4,220	32	0.74%	75%	0.17	0.03	0.2	0	0	0.00%	75%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.02	0.03	0.03	0.0	0.1	0.0	0.03	0.03	0.02	0.44	0.62	2.69	
Mar-22	175	0	0.000%	70%	0.00	0.00	0.0		125	0	0.000%	70%	0.00	0.00	0.0	4,220	32	0.74%	70%	0.16	0.03	0.2	0	0	0.00%	70%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.02	0.03	0.03	0.0	0.1	0.0	0.03	0.03	0.02	0.43	0.61	2.68	
Apr-22	175	0	0.000%	175%	0.00	0.00	0.0		125	0	0.000%	175%	0.00	0.00	0.0	4,220	32	0.74%	175%	0.41	0.07	0.6	0	0	0.00%	175%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.02	0.03	0.07	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-22	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	42,200	32	2.94%	170%	1.58	0.28	0.2	0	0	0.00%	170%	0.00	0.00	0.0	1.25	#####	14.23	60000	426,800	0.00	0.00	0.28	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-22	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	42,200	32	2.94%	150%	1.40	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	#####	14.23	60000	426,800	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-22	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	42,200	32	2.94%	40%	0.37	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	#####	14.23	60000	426,800	0.00	0.00	0.07	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-22	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	42,200	32	2.94%	60%	0.56	0.10	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	#####	14.23	60000	426,800	0.00	0.00	0.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-22	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	42,200	32	2.94%	150%	1.40	0.25	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	#####	14.23	60000	426,800	0.00	0.00	0.25	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-22	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	42,200	32	2.94%	75%	0.70	0.12	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	#####	14.23	60000	426,800	0.00	0.00	0.12	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-22	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	4,220	32	0.74%	75%	0.17	0.03	0.2	0	0	0.00%	75%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.00	0.00	0.03	0.0	0.0	0.0	0.02	0.02	0.01	0.31	0.47	2.30	
Dec-22	175	0	0.000%	100%	0.00	0.00	0.0		125	0	0.000%	100%	0.00	0.00	0.0	4,220	32	0.74%	100%	0.23	0.04	0.3	0	0	0.00%	100%	0.00	0.00	0.0	1.25	43400	2.57	60000	43,400	0.01	0.02	0.04	0.0	0.1	0.0	0.03	0.03	0.02	0.43	0.61	2.66	
Jan-23	175	0	0.000%	60%	0.00	0.00	0.0		125	0	0.000%	60%	0.00	0.00	0.0	3,770	35	0.74%	60%	0.15	0.03	0.2	0	0	0.00%	60%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.02	0.03	0.03	0.0	0.1	0.0	0.03	0.03	0.02	0.43	0.62	2.68	
Feb-23	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	3,770	35	0.74%	75%	0.19	0.03	0.3	0	0	0.00%	75%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.02	0.03	0.03	0.0	0.1	0.0	0.03	0.03	0.03	0.47	0.65	2.77	
Mar-23	175	0	0.000%	70%	0.00	0.00	0.0		125	0	0.000%	70%	0.00	0.00	0.0	3,770	35	0.74%	70%	0.18	0.03	0.3	0	0	0.00%	70%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.03	0.03	0.03	0.0	0.1	0.0	0.03	0.03	0.03	0.47	0.66	2.79	
Apr-23	175	0	0.000%	175%	0.00	0.00	0.0		125	0	0.000%	175%	0.00	0.00	0.0	3,770	35	0.74%	175%	0.45	0.08	0.7	0	0	0.00%	175%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.03	0.03	0.08	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-23	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	37,700	35	2.94%	170%	1.75	0.31	0.3	0	0	0.00%	170%	0.00	0.00	0.0	1.25	#####	12.86	60000	381,800	0.00	0.00	0.31	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-23	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	37,700	35	2.94%	150%	1.54	0.27	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	#####	12.86	60000	381,800	0.00	0.00	0.27	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-23	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	37,700	35	2.94%	40%	0.41	0.07	0.1	0	0	0.00%	40%	0.00	0.00	0.0	1.25	#####	12.86	60000	381,800	0.00	0.00	0.07	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-23	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	37,700	35	2.94%	60%	0.62	0.11	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	#####	12.86	60000	381,800	0.00	0.00	0.11	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-23	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	37,700	35	2.94%	150%	1.54	0.27	0.2	0	0	0.00%	150%	0.00	0.00	0.0	1.25	#####	12.86	60000	381,800	0.00	0.00	0.27	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-23	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	37,700	35	2.94%	75%	0.77	0.14	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	#####	12.86	60000	381,800	0.00	0.00	0.14	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-23	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	3,770	35	0.74%	75%	0.19	0.03	0.3	0	0	0.00%	75%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.00	0.00	0.03	0.0	0.0	0.0	0.02	0.02	0.01	0.34	0.50	2.39	
Dec-23	175	0	0.000%	100%	0.00	0.00	0.0		125	0	0.000%	100%	0.00	0.00	0.0	3,770	35	0.74%	100%	0.26	0.05	0.4	0	0	0.00%	100%	0.00	0.00	0.0	1.25	38900	2.43	60000	38,900	0.01	0.02	0.05	0.0	0.1	0.0	0.03	0.03	0.03	0.47	0.66	2.78	
Jan-24	175	0	0.000%	60%	0.00	0.00	0.0		125	0	0.000%	60%	0.00	0.00	0.0	3,830	10	0.74%	60%	0.04	0.01	0.1	0	0	0.00%	60%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.03	0.03	0.01	0.0	0.0	0.0	0.02	0.02	0.02	0.37	0.54	2.48	
Feb-24	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	3,830	10	0.74%	75%	0.06	0.01	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.02	0.02	0.01	0.0	0.0	0.0	0.01	0.02	0.01	0.31	0.47	2.31	
Mar-24	175	0	0.000%	70%	0.00	0.00	0.0		125	0	0.000%	70%	0.00	0.00	0.0	3,830	10	0.74%	70%	0.05	0.01	0.1	0	0	0.00%	70%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.01	0.02	0.01	0.0	0.0	0.0	0.01	0.01	0.01	0.28	0.43	2.20	
Apr-24	175	0	0.000%	175%	0.00	0.00	0.0		125	0	0.000%	175%	0.00	0.00	0.0	3,830	10	0.74%	175%	0.13	0.02	0.2	0	0	0.00%	175%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.01	0.01	0.02	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-24	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	38,300	10	2.94%	170%	0.50	0.09	0.1	0	0	0.00%	170%	0.00	0.00	0.0	1.25	#####	13.05	60000	387,800	0.00	0.00	0.09	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-24	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,300	10	2.94%	150%	0.44	0.08	0.1	0	0	0.00%	150%	0.00	0.00	0.0	1.25	#####	13.05	60000	387,800	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-24	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	38,300	10	2.94%	40%	0.12	0.02	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	#####	13.05	60000	387,800	0.00	0.00	0.02	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-24	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,300	10	2.94%	60%	0.18	0.03	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	#####	13.05	60000	387,800	0.00	0.00	0.03	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-24	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,300	10	2.94%	150%	0.44	0.08	0.1	0	0	0.00%	150%	0.00	0.00	0.0	1.25	#####	13.05	60000	387,800	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-24	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,300	10	2.94%	75%	0.22	0.04	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	#####	13.05	60000	387,800	0.00	0.00	0.04	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-24	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	3,830	10	0.74%	75%	0.06	0.01	0.1	0	0	0.00%	75%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.01	0.0	0.0	0.0	0.00	0.00	0.00	0.17	0.28	1.75	
Dec-24	175	0	0.000%	100%	0.00	0.00	0.0		125	0	0.000%	100%	0.00	0.00	0.0	3,830	10	0.74%	100%	0.07	0.01	0.1	0	0	0.00%	100%	0.00	0.00	0.0	1.25	39500	2.45	60000	39,500	0.00	0.00	0.01	0.0	0.0	0.0	0.01	0.01	0.01	0.23	0.37	2.03	
Jan-25	175	0	0.000%	60%	0.00	0.00	0.0		125	0	0.000%	60%	0.00	0.00	0.0	3,890	0	0.74%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.01	0.01	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.16	0.27	1.72	

WLWB Ammonia Model - Temporal Segregation plus Snowmaking

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Feb-25	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	3,890	0	0.74%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.11	0.20	1.45	
Mar-25	175	0	0.000%	70%	0.00	0.00	0.0		125	0	0.000%	70%	0.00	0.00	0.0	3,890	0	0.74%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.08	0.15	1.23	
Apr-25	175	0	0.000%	175%	0.00	0.00	0.0		125	0	0.000%	175%	0.00	0.00	0.0	3,890	0	0.74%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-25	700	0	0.000%	170%	0.00	0.00	0.0		500	0	0.000%	170%	0.00	0.00	0.0	38,900	0	2.94%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	1.25	#####	13.23	60000	393,800	0.00	0.00	0.00	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-25	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,900	0	2.94%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	#####	13.23	60000	393,800	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-25	700	0	0.000%	40%	0.00	0.00	0.0		500	0	0.000%	40%	0.00	0.00	0.0	38,900	0	2.94%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	#####	13.23	60000	393,800	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-25	700	0	0.000%	60%	0.00	0.00	0.0		500	0	0.000%	60%	0.00	0.00	0.0	38,900	0	2.94%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	#####	13.23	60000	393,800	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-25	700	0	0.000%	150%	0.00	0.00	0.0		500	0	0.000%	150%	0.00	0.00	0.0	38,900	0	2.94%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	#####	13.23	60000	393,800	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-25	700	0	0.000%	75%	0.00	0.00	0.0		500	0	0.000%	75%	0.00	0.00	0.0	38,900	0	2.94%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	#####	13.23	60000	393,800	0.00	0.00	0.00	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-25	175	0	0.000%	75%	0.00	0.00	0.0		125	0	0.000%	75%	0.00	0.00	0.0	3,890	0	0.74%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-25	175	0	0.000%	100%	0.00	0.00	0.0		125	0	0.000%	100%	0.00	0.00	0.0	3,890	0	0.74%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	40100	2.47	60000	40,100	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Lowest Practical Case

WLWB AMMONIA MANAGEMENT MODEL OF DIAVIK PROJECT				
CASE:	**Lowest Practical**			
BLASTING:	Combo#2: Double prime, improve loading, 80/20 emulsion/ANFO mix; thick emulsion; reduced residence time; PE liner in wet holes; imrove stemming (55% average reduction, 70% peak)			
AN USE:	Past and future use as per Diavik ADP projections (SNC-Lavalin, Ammonia Balance, May 2006)			
MINE INFLOW:	Actual to present, predicted inflows (Golder, 2006) in future.			
WATER MANAGEMENT:	All mine water exept A418 Surface Mine discharged to North Inlet; live capacity of Inlet increased 2 million cubic meters			
TREATMENT:	Natural biological treatment in North Inlet to continue with use of mats and greater water capacity for 50% increase over current degradation			
FLOW TO LAC DE GRAS:	Actual to present, future discharge equal to input in same month.			
RESULTS	**FROM BEGINNING OF**	**03**	**07**	**08**
AMMONIA (N) TO LDG	**TO END OF**	**06**	**07**	**25**
	Average	2.3	1.0	0.1
	Maximum 30 Day	5.1	2.4	0.8
	Maximum 1 Day	8.6	5.7	3.1
	Maximum 95% UCL 30 Day	7.1	5.1	3.0
	Maximum 95% UCL 1 Day	10.3	8.5	6.5



WLWB Ammonia Model - Lowest Practical Case

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Jan-03	5,380	867	0.924%	60%	4.80	0.85	5.2	8.4	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	5380	1.41	32000	17,905	1.00	1.25	0.85	0.0	2.1	1.5	0.81	1.29	1.49	4.35	4.06	7.57	1.0
Feb-03	5,667	867	0.924%	75%	6.00	1.06	6.2	7.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	5667	1.42	32000	17,175	1.49	1.86	1.06	0.0	2.9	2.1	1.07	1.85	2.05	5.20	4.70	8.20	1.3
Mar-03	5,954	867	0.924%	70%	5.60	0.99	5.5	5.1	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	5954	1.43	32000	16,854	2.05	2.57	0.99	0.0	3.6	2.5	1.28	2.29	2.49	5.78	5.12	8.60	1.4
Apr-03	6,251	867	0.924%	175%	14.01	2.48	13.0	10.5	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	1.25	6251	1.44	32000	16,875	2.49	3.11	2.48	1.0	4.6	3.2	1.64	2.96	3.19	6.62	5.73	9.14	1.9
May-03	5,936	867	0.924%	170%	13.61	2.41	13.3	5.4	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	1.25	5936	1.43	32000	25,514	3.19	3.99	2.41	2.0	4.4	3.1	2.39	2.01	3.07	6.49	5.64	9.06	2.5
Jun-03	7,290	867	0.924%	150%	12.01	2.13	9.6	3.2	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	7290	1.47	32000	29,485	3.07	3.84	2.13	3.0	3.0	2.0	1.81	1.16	2.02	5.15	4.66	8.16	1.2
Jul-03	6,867	867	0.924%	40%	3.20	0.57	2.7	6.7	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	6867	1.46	32000	28,379	2.02	2.52	0.57	3.0	0.1	0.1	0.05	0.04	0.06	0.76	0.98	3.45	0.6
Aug-03	7,753	867	0.924%	60%	4.80	0.85	3.6	6.1	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	7753	1.49	32000	27,138	0.06	0.08	0.85	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.2
Sep-03	8,194	867	0.924%	150%	12.01	2.13	8.5	8.4	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	8194	1.50	32000	29,865	0.00	0.00	2.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.6
Oct-03	8,775	867	0.924%	75%	6.00	1.06	4.0	6.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	8775	1.52	32000	27,977	0.00	0.00	1.06	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.9
Nov-03	8,935	867	0.924%	75%	6.00	1.06	3.9	6.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	8935	1.52	32000	15,411	0.00	0.00	1.06	0.0	1.1	0.7	0.33	0.74	0.70	2.87	2.89	6.28	1.3
Dec-03	8,301	867	0.924%	100%	8.01	1.42	5.6	5.1	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	8301	1.50	32000	24,385	0.70	0.87	1.42	0.0	2.3	1.5	1.13	1.16	1.53	4.42	4.11	7.62	2.2
Jan-04	8,570	808	1.598%	60%	7.75	1.37	5.3	4.3	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	8570	1.51	32000	13,372	1.53	1.91	1.37	0.0	3.3	2.2	0.88	2.40	2.17	5.36	4.82	8.31	2.0
Feb-04	7,982	808	1.598%	75%	9.69	1.72	7.1	5.9	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	7982	1.49	32000	7,407	2.17	2.71	1.72	0.0	4.4	3.0	0.67	3.76	2.97	6.37	5.55	8.98	1.7
Mar-04	8,828	808	1.598%	70%	9.04	1.60	6.0	6.0	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	8828	1.52	32000	3,826	2.97	3.71	1.60	0.0	5.3	3.5	0.41	4.91	3.50	6.97	5.97	9.35	2.4
Apr-04	9,324	808	1.598%	175%	22.60	4.00	14.1	5.3	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	1.25	9324	1.53	32000	0	3.50	4.37	4.00	1.0	7.4	4.8	0.00	7.38	4.81	8.30	6.89	10.12	2.2
May-04	10,755	808	1.598%	170%	21.95	3.89	11.9	9.3	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	1.25	10755	1.58	32000	0	4.81	6.01	3.89	2.0	7.9	5.0	0.00	7.90	5.01	8.49	7.02	10.22	2.9
Jun-04	12,337	808	1.598%	150%	19.37	3.43	9.1	5.3	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	12337	1.63	32000	16,027	5.01	6.26	3.43	3.0	6.7	4.1	2.01	4.69	4.12	7.63	6.43	9.74	2.0
Jul-04	11,098	808	1.598%	40%	5.17	0.92	2.7	13.4	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	11098	1.59	32000	25,310	4.12	5.15	0.92	3.0	3.1	1.9	1.49	1.58	1.93	5.03	4.57	8.07	1.1
Aug-04	11,394	808	1.598%	60%	7.75	1.37	4.0	8.9	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	11394	1.60	32000	28,658	1.93	2.41	1.37	3.0	0.8	0.5	0.43	0.36	0.49	2.37	2.47	5.76	1.2
Sep-04	12,030	808	1.598%	150%	19.37	3.43	9.4	6.7	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	12030	1.62	32000	27,577	0.49	0.62	3.43	3.0	1.0	0.6	0.54	0.50	0.65	2.76	2.80	6.17	1.3
Oct-04	11,948	808	1.598%	75%	9.69	1.72	4.7	6.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11948	1.61	32000	13,563	0.65	0.81	1.72	2.0	0.5	0.3	0.14	0.39	0.33	1.89	2.06	5.20	2.1
Nov-04	11,300	808	1.598%	75%	9.69	1.72	5.0	7.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11300	1.59	32000	12,590	0.33	0.41	1.72	0.0	2.1	1.3	0.51	1.61	1.33	4.10	3.87	7.37	3.7
Dec-04	10,514	808	1.598%	100%	12.91	2.29	7.2	5.1	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	10514	1.57	32000	11,561	1.33	1.67	2.29	0.0	4.0	2.5	0.89	3.07	2.52	5.82	5.15	8.62	4.2
Jan-05	10,958	725	1.979%	60%	8.61	1.53	4.6	4.5	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	10958	1.58	32000	10,692	2.52	3.15	1.53	0.0	4.7	3.0	0.96	3.72	2.95	6.35	5.53	8.97	3.3
Feb-05	11,359	725	1.979%	75%	10.76	1.91	5.5	4.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11359	1.60	32000	12,385	2.95	3.69	1.91	0.0	5.6	3.5	1.32	4.28	3.51	6.98	5.98	9.36	3.7
Mar-05	12,270	725	1.979%	70%	10.04	1.78	4.8	5.8	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	12270	1.62	32000	12,748	3.51	4.39	1.78	0.0	6.2	3.8	1.47	4.69	3.80	7.29	6.20	9.55	3.4
Apr-05	13,110	725	1.979%	175%	25.11	4.45	11.2	11.5	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	1.25	13110	1.65	32000	13,667	3.80	4.75	4.45	1.0	8.2	5.0	2.07	6.13	4.97	8.46	7.00	10.20	4.6
May-05	14,120	725	1.979%	170%	24.39	4.32	10.1	11.7	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	1.25	14120	1.68	32000	16,000	4.97	6.22	4.32	2.0	8.5	5.1	2.47	6.06	5.08	8.56	7.07	10.26	5.5
Jun-05	15,045	725	1.979%	150%	21.52	3.81	8.3	10.7	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	15045	1.71	32000	17,531	5.08	6.35	3.81	3.0	7.2	4.2	2.24	4.93	4.20	7.70	6.48	9.79	4.6
Jul-05	15,261	725	1.979%	40%	5.74	1.02	2.2	5.1	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	15261	1.71	32000	8,477	4.20	5.25	1.02	3.0	3.3	1.9	0.49	2.77	1.90	4.99	4.54	8.05	1.7
Aug-05	14,863	725	1.979%	60%	8.61	1.53	3.4	3.3	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	14863	1.70	32000	17,738	1.90	2.38	1.53	3.0	0.9	0.5	0.29	0.62	0.53	2.48	2.56	5.87	0.5
Sep-05	15,820	725	1.979%	150%	21.52	3.81	7.9	2.2	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	15820	1.73	32000	24,395	0.53	0.67	3.81	3.0	1.5	0.9	0.63	0.85	0.86	3.21	3.17	6.60	0.2
Oct-05	15,681	725	1.979%	75%	10.76	1.91	4.0	2.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15681	1.73	32000	21,915	0.86	1.07	1.91	2.0	1.0	0.6	0.38	0.60	0.57	2.56	2.63	5.96	0.3
Nov-05	15,693	725	1.979%	75%	10.76	1.91	4.0	3.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15693	1.73	32000	17,253	0.57	0.71	1.91	0.0	2.6	1.5	0.79	1.82	1.51	4.40	4.10	7.60	1.2
Dec-05	14,884	725	1.979%	100%	14.35	2.54	5.6	6.3	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	14884	1.70	32000	14,961	1.51	1.89	2.54	0.0	4.4	2.6	1.19	3.25	2.60	5.92	5.23	8.69	2.6
Jan-06	15,584	642	2.256%	60%	8.69	1.54	3.2	3.7	250	0	0.000%	60%	0.00	0.00	0.0	0	46	2.94%	60%	0.81	0.14	#DIV/0!	0	0	0.00%	60%	0.00	0.00	0.0	1.25	15834	1.73	32000	15,041	2.60	3.26	1.68	0.0	4.9	2.9	1.30	3.63	2.85	6.23	5.45	8.89	2.8
Feb-06	15,104	642	2.256%	75%	10.86	1.92	4.2	4.8	250	0	0.000%	75%	0.00	0.00	0.0	0	46	2.94%	75%	1.01	0.18	#DIV/0!	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15354	1.72	32000	15,114	2.85	3.56	2.10	0.0	5.7	3.3	1.52	4.15	3.30	6.75	5.82	9.22	3.0
Mar-06	15,618	642	2.256%	70%	10.14	1.80	3.8	3.1	250	0	0.000%	70%	0.00	0.00	0.0	0	46	2.94%	70%	0.94	0.17	#DIV/0!	0	0	0.00%	70%	0.00	0.00	0.0	1.25	15868	1.73	32000	19,356	3.30	4.13	1.96	0.0	6.1	3.5	2.07	4.02	3.51	6.99	5.99	9.36	3.3
Apr-06	16,453	642	2.256%	175%	25.34	4.49	9.0	9.6	250	0	0.000%	175%	0.00	0.00	0.0	0	46	2.94%	175%	2.35	0.42	#DIV/0!	0	0	0.00%	175%	0.00	0.00	0.0	1.25	16703	1.76	32000	17,439	3.51	4.39	4.91	1.0	8.3	4.7	2.50	5.80	4.72	8.22	6.84	10.07	4.6
May-06	19,475	642	2.256%	170%	24.61	4.36	7.4	5.3	250	0	0.000%	170%	0.00	0.00	0.0	0	46	2.94%	170%	2.28	0.40	#DIV/0!	0	0	0.00%	170%	0.00	0.00	0.0	1.25	19725	1.85	32000	20,203	4.72	5.90	4.77	2.0	8.7	4.7	2.88	5.79	4.69	8.18	6.81	10.06	3.7
Jun-06	18,310	642	2.256%	150%	21.72	3.85	6.9	3.4	250	0	0.000%	150%	0.00	0.00	0.0	22	46	2.94%	150%	2.01	0.36	531.3	0	0	0.00%	150%	0.00	0.00	0.0	1.25	18582	1.82	32000	27,717	4.69	5.86	4.21	3.0	7.1	3.9	3.28	3.78	3.89	7.39	6.27	9.60	1.4
Jul-06	17,677	642	2.256%	40%	5.79	1.03	1.9	4.4	250	0	0.000%	40%	0.00	0.00	0.0	40	46	2.94%	40%	0.54	0.10	77.3	0	0	0.00%	40%	0.00	0.00	0.0	1.25	17967	1.80	32000	22,154	3.89	4.86	1.12	3.0	3.0	1.7	1.12	1.87	1.66	4.63	4.27	7.78	0.2
Aug-06	18,560	642	2.256%	60%	8.69	1.54	2.7	7.3	250	0	0.000%	60%	0.00	0.00	0.0	38	46	2.94%	60%	0.81	0.14	122.6	0	0	0.00%	60%	0.00	0.00	0.0	1.25	18849	1.82	32000	18,801	1.66	2.08	1.68	3.0	0.8	0.4	0.24	0.52	0.42	2.16	2.29	5.52	0.5
Sep-06	19,176	642	2.256%	150%	21.72	3.85	6.6	5.4	250	0	0.000%	150%	0.00	0.00	0.0	154	46	2.94%	150%	2.01	0.36	76.1	0	0	0.00%	150%	0.00	0.00	0.0	1.25	19580	1.85	32000	25,748	0.42	0.52	4.21	3.0	1.7	0.9	0.73	0.99	0.94	3.37	3.30	6.75	1.0
Oct-06	18,487	642	2.256%	75%	10.86	1.92	3.4	3.7	250	0	0.000%	75%	0.00	0.00	0.0	430	46	2.94%	75%	1.01	0.18	13.6	0	0	0.00%	75%	0.00	0.00	0.0	1.25	19166	1.83	32000	26,010	0.94	1.17	2.10	2.0	1.3	0.7	0.55	0.72	0.69	2.86	2.88	6.27	1.1
Nov-06	19,635	642	2.256%	75%	10.86	1.92	3.2	2.4	250	0	0.000%	75%	0.00	0.00	0.0	687	46	2.94%	75%	1.01	0.18	8.5	0	0	0.00%	75%	0.00	0.00	0.0	1.25	20572	1.88	32000	23,981	0.69	0.87	2.10	0.0	3.0	1.6	1.16	1.82	1.58	4.51	4.18	7.69	1.5
Dec-06	17,652	642	2.256%	100%	14.48	2.57	4.8	4.5	250	0	0.000%	100%	0.00	0.00	0.0	929	46	2.94%	100%	1.34	0.24	8.4	0	0	0.00%	100%	0.00	0.00	0.0	1.25	18831	1.82	32000	19,976	1.58	1.98	2.80	0.0	4.8	2.6	1.59	3.19	2.62	5.95	5.25	8.71	2.1
Jan-07	17,200	408	1.535%	91%	5.71	1.01	1.9									8,200	33	2.94%	91%	0.87	0.15	0.6	0	0	1.535%	91%	0.00	0.00	0.0	3.25	25400	4.02	32000	25,400	2.62	8.53	1.17	0.0	9.7	2.4	1.86	7.83	2.41	5.68	5.05	8.53	
Feb-07	17,200	408	1.535%	94%	5.92	1.05	2.0									8,200	33	2.94%	94%	0.90	0.16	0.6	0	0	1.535%	94%	0.00	0.00	0.0	3.25	25400	4.02	32000	25,400	2.41	7.83	1.21	0.0	9.0	2.2	1.74	7.30	2.25	5.46	4.89	8.38	
Mar-07	17,200	408	1.535%	93%	5.85	1.04	2.0									8,200	33	2.94%	93%	0.89	0.16	0.6	0	0	1.535%	93%	0.00	0.00	0.0	3.25	25400	4.02	32000	25,400	2.25	7.30	1.19	0.0	8.5	2.1	1.63	6.87	2.11	5.28	4.76	8.26	
Apr-07	17,200	408	1.535%	117%	7.31	1.30	2.5									8,200	33	2.94%	117%	1.11	0.20	0.8	0	0	1.535%	117%	0.00	0.00	0.0	3.25	25400	4.02	32000	25,400	2.11	6.87	1.49	1.0	7.4	1.8	1.41	5.95	1.83	4.88	4.46	7.97	
May-07	17,200	408	1.535%	116%	7.24	1.28	2.5									8,200	33	2.94%	116%	1.10	0.20	0.8	0	0	1.535%	116%	0.00	0.00	0.0	3.25	25400	4.02	45000	25,400	1.83	5.95	1.48	2.0	5.4	1.3	1.04	4.38	1.35	4.13	3.89	7.39	

WLWB Ammonia Model - Lowest Practical Case

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Jun-07	17,200	408	1.535%	111%	6.96	1.23	2.4									8,200	33	2.94%	111%	1.06	0.19	0.8	0	0	1.535%	111%	0.00	0.00	0.0	3.25	25400	4.02	45000	25,400	1.35	4.38	1.42	3.0	2.8	0.7	0.54	2.27	0.70	2.87	2.89	6.28	
Jul-07	17,200	408	1.535%	87%	5.43	0.96	1.8									8,200	33	2.94%	87%	0.83	0.15	0.6	0	0	1.535%	87%	0.00	0.00	0.0	3.25	25400	4.02	45000	25,400	0.70	2.27	1.11	3.0	0.4	0.1	0.07	0.30	0.09	0.95	1.17	3.81	
Aug-07	17,200	408	1.535%	91%	5.71	1.01	1.9									8,200	33	2.94%	91%	0.87	0.15	0.6	0	0	1.535%	91%	0.00	0.00	0.0	3.25	25400	4.02	45000	25,400	0.09	0.30	1.17	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-07	17,200	408	1.535%	111%	6.96	1.23	2.4									8,200	33	2.94%	111%	1.06	0.19	0.8	0	0	1.535%	111%	0.00	0.00	0.0	3.25	25400	4.02	45000	25,400	0.00	0.00	1.42	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-07	17,200	408	1.535%	94%	5.92	1.05	2.0									8,200	33	2.94%	94%	0.90	0.16	0.6	0	0	1.535%	94%	0.00	0.00	0.0	3.25	25400	4.02	45000	25,400	0.00	0.00	1.21	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-07	17,200	408	1.535%	94%	5.92	1.05	2.0									8,200	33	2.94%	94%	0.90	0.16	0.6	0	0	1.535%	94%	0.00	0.00	0.0	3.25	25400	4.02	45000	25,400	0.00	0.00	1.21	0.0	1.2	0.3	0.23	0.98	0.30	1.81	1.98	5.09	
Dec-07	17,200	408	1.535%	100%	6.27	1.11	2.1									8,200	33	2.94%	100%	0.96	0.17	0.7	0	0	1.535%	100%	0.00	0.00	0.0	3.25	25400	4.02	45000	25,400	0.30	0.98	1.28	0.0	2.3	0.6	0.43	1.82	0.56	2.55	2.62	5.95	
Jan-08	8,950	90	1.535%	91%	1.26	0.22	0.8									24,600	28	2.94%	91%	0.76	0.13	0.2	0	0	1.535%	91%	0.00	0.00	0.0	3.25	33550	4.27	45000	33,550	0.56	1.82	0.36	0.0	2.2	0.5	0.52	1.66	0.51	2.42	2.51	5.81	
Feb-08	8,950	90	1.535%	94%	1.30	0.23	0.8									24,600	28	2.94%	94%	0.79	0.14	0.2	0	0	1.535%	94%	0.00	0.00	0.0	3.25	33550	4.27	45000	33,550	0.51	1.66	0.37	0.0	2.0	0.5	0.49	1.54	0.48	2.32	2.43	5.71	
Mar-08	8,950	90	1.535%	93%	1.29	0.23	0.8									24,600	28	2.94%	93%	0.78	0.14	0.2	0	0	1.535%	93%	0.00	0.00	0.0	3.25	33550	4.27	45000	33,550	0.48	1.54	0.37	0.0	1.9	0.4	0.46	1.45	0.45	2.25	2.37	5.62	
Apr-08	8,950	90	1.535%	117%	1.61	0.29	1.0									24,600	28	2.94%	117%	0.97	0.17	0.2	0	0	1.535%	117%	0.00	0.00	0.0	3.25	33550	4.27	45000	33,550	0.45	1.45	0.46	1.0	0.9	0.2	0.22	0.69	0.21	1.50	1.70	4.68	
May-08	8,950	90	1.535%	116%	1.60	0.28	1.0									24,600	28	2.94%	116%	0.96	0.17	0.2	0	0	1.535%	116%	0.00	0.00	0.0	3.25	33550	4.27	45000	33,550	0.21	0.69	0.45	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-08	8,950	90	1.535%	111%	1.53	0.27	1.0									24,600	28	2.94%	111%	0.93	0.16	0.2	0	0	1.535%	111%	0.00	0.00	0.0	3.25	33550	4.27	45000	33,550	0.00	0.00	0.44	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-08	8,950	90	1.535%	87%	1.20	0.21	0.8									24,600	28	2.94%	87%	0.72	0.13	0.2	0	0	1.535%	87%	0.00	0.00	0.0	3.25	33550	4.27	45000	33,550	0.00	0.00	0.34	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-08	8,950	90	1.535%	91%	1.26	0.22	0.8									24,600	28	2.94%	91%	0.76	0.13	0.2	0	0	1.535%	91%	0.00	0.00	0.0	3.25	33550	4.27	45000	33,550	0.00	0.00	0.36	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-08	8,950	90	1.535%	111%	1.53	0.27	1.0									24,600	28	2.94%	111%	0.93	0.16	0.2	0	0	1.535%	111%	0.00	0.00	0.0	3.25	33550	4.27	45000	33,550	0.00	0.00	0.44	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-08	8,950	90	1.535%	94%	1.30	0.23	0.8									24,600	28	2.94%	94%	0.79	0.14	0.2	0	0	1.535%	94%	0.00	0.00	0.0	3.25	33550	4.27	45000	33,550	0.00	0.00	0.37	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-08	8,950	90	1.535%	94%	1.30	0.23	0.8									24,600	28	2.94%	94%	0.79	0.14	0.2	0	0	1.535%	94%	0.00	0.00	0.0	3.25	33550	4.27	45000	33,550	0.00	0.00	0.37	0.0	0.4	0.1	0.09	0.28	0.09	0.91	1.13	3.75	
Dec-08	8,950	90	1.535%	100%	1.38	0.24	0.9									24,600	28	2.94%	100%	0.83	0.15	0.2	0	0	1.535%	100%	0.00	0.00	0.0	3.25	33550	4.27	45000	33,550	0.09	0.28	0.39	0.0	0.7	0.2	0.16	0.51	0.16	1.27	1.48	4.35	
Jan-09	700	0	1.535%	91%	0.00	0.00	0.0									40,900	18	2.94%	91%	0.47	0.08	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	41600	4.52	60000	41,600	0.16	0.51	0.08	0.0	0.6	0.1	0.17	0.43	0.13	1.15	1.37	4.16	
Feb-09	700	0	1.535%	94%	0.00	0.00	0.0									40,900	18	2.94%	94%	0.49	0.09	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	41600	4.52	60000	41,600	0.13	0.43	0.09	0.0	0.5	0.1	0.14	0.37	0.11	1.06	1.28	4.01	
Mar-09	700	0	1.535%	93%	0.00	0.00	0.0									40,900	18	2.94%	93%	0.48	0.09	0.1	0	0	1.535%	93%	0.00	0.00	0.0	3.25	41600	4.52	60000	41,600	0.11	0.37	0.09	0.0	0.5	0.1	0.13	0.33	0.10	0.99	1.21	3.89	
Apr-09	700	0	1.535%	117%	0.00	0.00	0.0									40,900	18	2.94%	117%	0.60	0.11	0.1	0	0	1.535%	117%	0.00	0.00	0.0	3.25	41600	4.52	60000	41,600	0.10	0.33	0.11	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-09	700	0	1.535%	116%	0.00	0.00	0.0									40,900	18	2.94%	116%	0.59	0.11	0.1	0	0	1.535%	116%	0.00	0.00	0.0	3.25	41600	4.52	60000	41,600	0.00	0.00	0.11	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-09	700	0	1.535%	111%	0.00	0.00	0.0									40,900	18	2.94%	111%	0.57	0.10	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	41600	4.52	60000	41,600	0.00	0.00	0.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-09	700	0	1.535%	87%	0.00	0.00	0.0									40,900	18	2.94%	87%	0.45	0.08	0.1	0	0	1.535%	87%	0.00	0.00	0.0	3.25	41600	4.52	60000	41,600	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-09	700	0	1.535%	91%	0.00	0.00	0.0									40,900	18	2.94%	91%	0.47	0.08	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	41600	4.52	60000	41,600	0.00	0.00	0.08	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-09	700	0	1.535%	111%	0.00	0.00	0.0									40,900	18	2.94%	111%	0.57	0.10	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	41600	4.52	60000	41,600	0.00	0.00	0.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-09	700	0	1.535%	94%	0.00	0.00	0.0									40,900	18	2.94%	94%	0.49	0.09	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	41600	4.52	60000	41,600	0.00	0.00	0.09	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-09	700	0	1.535%	94%	0.00	0.00	0.0									40,900	18	2.94%	94%	0.49	0.09	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	41600	4.52	60000	41,600	0.00	0.00	0.09	0.0	0.1	0.0	0.02	0.06	0.02	0.40	0.57	2.57	
Dec-09	700	0	1.535%	100%	0.00	0.00	0.0									40,900	18	2.94%	100%	0.51	0.09	0.1	0	0	1.535%	100%	0.00	0.00	0.0	3.25	41600	4.52	60000	41,600	0.02	0.06	0.09	0.0	0.2	0.0	0.04	0.11	0.03	0.54	0.74	2.97	
Jan-10	700	0	1.535%	91%	0.00	0.00	0.0									39,200	11	2.94%	91%	0.29	0.05	0.0	0	0	1.535%	91%	0.00	0.00	0.0	3.25	39900	4.46	60000	39,900	0.03	0.11	0.05	0.0	0.2	0.0	0.04	0.12	0.04	0.57	0.76	3.02	
Feb-10	700	0	1.535%	94%	0.00	0.00	0.0									39,200	11	2.94%	94%	0.30	0.05	0.0	0	0	1.535%	94%	0.00	0.00	0.0	3.25	39900	4.46	60000	39,900	0.04	0.12	0.05	0.0	0.2	0.0	0.05	0.13	0.04	0.58	0.78	3.06	
Mar-10	700	0	1.535%	93%	0.00	0.00	0.0									39,200	11	2.94%	93%	0.30	0.05	0.0	0	0	1.535%	93%	0.00	0.00	0.0	3.25	39900	4.46	60000	39,900	0.04	0.13	0.05	0.0	0.2	0.0	0.05	0.13	0.04	0.60	0.80	3.09	
Apr-10	700	0	1.535%	117%	0.00	0.00	0.0									39,200	11	2.94%	117%	0.37	0.07	0.1	0	0	1.535%	117%	0.00	0.00	0.0	3.25	39900	4.46	60000	39,900	0.04	0.13	0.07	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-10	700	0	1.535%	116%	0.00	0.00	0.0									39,200	11	2.94%	116%	0.37	0.07	0.1	0	0	1.535%	116%	0.00	0.00	0.0	3.25	39900	4.46	60000	39,900	0.00	0.00	0.07	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-10	700	0	1.535%	111%	0.00	0.00	0.0									39,200	11	2.94%	111%	0.36	0.06	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	39900	4.46	60000	39,900	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-10	700	0	1.535%	87%	0.00	0.00	0.0									39,200	11	2.94%	87%	0.28	0.05	0.0	0	0	1.535%	87%	0.00	0.00	0.0	3.25	39900	4.46	60000	39,900	0.00	0.00	0.05	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-10	700	0	1.535%	91%	0.00	0.00	0.0									39,200	11	2.94%	91%	0.29	0.05	0.0	0	0	1.535%	91%	0.00	0.00	0.0	3.25	39900	4.46	60000	39,900	0.00	0.00	0.05	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-10	700	0	1.535%	111%	0.00	0.00	0.0									39,200	11	2.94%	111%	0.36	0.06	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	39900	4.46	60000	39,900	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-10	700	0	1.535%	94%	0.00	0.00	0.0									39,200	11	2.94%	94%	0.30	0.05	0.0	0	0	1.535%	94%	0.00	0.00	0.0	3.25	39900	4.46	60000	39,900	0.00	0.00	0.05	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-10	700	0	1.535%	94%	0.00	0.00	0.0									39,200	11	2.94%	94%	0.30	0.05	0.0	0	0	1.535%	94%	0.00	0.00	0.0	3.25	39900	4.46	60000	39,900	0.00	0.00	0.05	0.0	0.1	0.0	0.01	0.04	0.01	0.31	0.47	2.30	
Dec-10	700	0	1.535%	100%	0.00	0.00	0.0									39,200	11	2.94%	100%	0.32	0.06	0.0	0	0	1.535%	100%	0.00	0.00	0.0	3.25	39900	4.46	60000	39,900	0.01	0.04	0.06	0.0	0.1	0.0	0.03	0.07	0.02	0.42	0.60	2.65	
Jan-11	700	0	1.535%	91%	0.00	0.00	0.0									37,400	33	2.94%	91%	0.87	0.15	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	38100	4.41	60000	38,100	0.02	0.07	0.15	0.0	0.2	0.1	0.06	0.17	0.05	0.68	0.89	3.28	
Feb-11	700	0	1.535%	94%	0.00	0.00	0.0									37,400	33	2.94%	94%	0.90	0.16	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	38100	4.41	60000	38,100	0.05	0.17	0.16	0.0	0.3	0.1	0.09	0.24	0.07	0.83	1.05	3.60	
Mar-11	700	0	1.535%	93%	0.00	0.00	0.0									37,400	33	2.94%	93%	0.89	0.16	0.1	0	0	1.535%	93%	0.00	0.00	0.0	3.25	38100	4.41	60000	38,100	0.07	0.24	0.16	0.0	0.4	0.1	0.10	0.29	0.09	0.93	1.15	3.78	
Apr-11	700	0	1.535%	117%	0.00	0.00	0.0									37,400	33	2.94%	117%	1.11	0.20	0.2	0	0	1.535%	117%	0.00	0.00	0.0	3.25	38100	4.41	60000	38,100	0.09	0.29	0.20	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-11	700	0	1.535%	116%	0.00	0.00	0.0									37,400	33	2.94%	116%	1.10	0.20	0.2	0	0	1.535%	116%	0.00	0.00	0.0	3.25	38100	4.41	60000	38,100	0.00	0.00	0.20	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-11	700	0	1.535%	111%	0.00	0.00	0.0									37,400	33	2.94%	111%	1.06	0.19	0.2	0	0	1.535%	111%	0.00	0.00	0.0	3.25	38100	4.41	60000	38,100	0.00	0.00	0.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-11	700	0	1.535%	87%	0.00	0.00	0.0									37,400	33	2.94%	87%	0.83	0.15	0.1	0	0	1.535%	87%	0.00	0.00	0.0	3.25	38100	4.41	60000	38,100	0.00	0.00	0.15	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-11	700	0	1.535%	91%	0.00	0.00	0.0									37,400	33	2.94%	91%	0.87	0.15	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	38100	4.41	60000	38,100	0.00	0.00	0.15	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-11	700	0	1.535%	111%	0.00	0.00	0.0									37,400	33	2.94%	111%	1.06	0.19	0.2	0	0	1.535%	111%	0.00	0.00	0.0	3.25	38100	4.41	60000	38,100	0.00	0.00	0.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-11	700	0	1.535%	94%	0.00	0.00	0.0									37,400	33	2.94%	94%	0.90	0.16	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	38100	4.41	60000	38,100	0.00	0.00	0.16	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Lowest Practical Case

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Nov-11	700	0	1.535%	94%	0.00	0.00	0.0									37,400	33	2.94%	94%	0.90	0.16	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	38100	4.41	60000	38,100	0.00	0.00	0.16	0.0	0.2	0.0	0.04	0.12	0.04	0.56	0.76	3.02	
Dec-11	700	0	1.535%	100%	0.00	0.00	0.0									37,400	33	2.94%	100%	0.96	0.17	0.1	0	0	1.535%	100%	0.00	0.00	0.0	3.25	38100	4.41	60000	38,100	0.04	0.12	0.17	0.0	0.3	0.1	0.08	0.21	0.07	0.78	0.99	3.49	
Jan-12	700	0	1.535%	91%	0.00	0.00	0.0									37,350	30	2.94%	91%	0.80	0.14	0.1	2,100	190	1.535%	91%	2.92	0.52	8.1	3.25	40150	4.47	60000	40,150	0.07	0.21	0.66	0.0	0.9	0.2	0.24	0.63	0.19	1.42	1.63	4.58	
Feb-12	700	0	1.535%	94%	0.00	0.00	0.0									37,350	30	2.94%	94%	0.83	0.15	0.1	2,100	190	1.535%	94%	2.92	0.52	8.1	3.25	40150	4.47	60000	40,150	0.19	0.63	0.66	0.0	1.3	0.3	0.35	0.94	0.29	1.77	1.95	5.05	
Mar-12	700	0	1.535%	93%	0.00	0.00	0.0									37,350	30	2.94%	93%	0.82	0.15	0.1	2,100	190	1.535%	93%	2.92	0.52	8.1	3.25	40150	4.47	60000	40,150	0.29	0.94	0.66	0.0	1.6	0.4	0.44	1.17	0.36	1.99	2.14	5.32	
Apr-12	700	0	1.535%	117%	0.00	0.00	0.0									37,350	30	2.94%	117%	1.03	0.18	0.2	2,100	190	1.535%	117%	2.92	0.52	8.1	3.25	40150	4.47	60000	40,150	0.36	1.17	0.70	1.0	0.9	0.2	0.24	0.63	0.19	1.42	1.62	4.57	
May-12	700	0	1.535%	116%	0.00	0.00	0.0									37,350	30	2.94%	116%	1.02	0.18	0.2	2,100	190	1.535%	116%	2.92	0.52	8.1	3.25	40150	4.47	60000	40,150	0.19	0.63	0.70	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-12	700	0	1.535%	111%	0.00	0.00	0.0									37,350	30	2.94%	111%	0.98	0.17	0.2	2,100	190	1.535%	111%	2.92	0.52	8.1	3.25	40150	4.47	60000	40,150	0.00	0.00	0.69	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-12	700	0	1.535%	87%	0.00	0.00	0.0									37,350	30	2.94%	87%	0.76	0.14	0.1	2,100	190	1.535%	87%	2.92	0.52	8.1	3.25	40150	4.47	60000	40,150	0.00	0.00	0.65	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-12	700	0	1.535%	91%	0.00	0.00	0.0									37,350	30	2.94%	91%	0.80	0.14	0.1	2,100	190	1.535%	91%	2.92	0.52	8.1	3.25	40150	4.47	60000	40,150	0.00	0.00	0.66	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-12	700	0	1.535%	111%	0.00	0.00	0.0									37,350	30	2.94%	111%	0.98	0.17	0.2	2,100	190	1.535%	111%	2.92	0.52	8.1	3.25	40150	4.47	60000	40,150	0.00	0.00	0.69	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-12	700	0	1.535%	94%	0.00	0.00	0.0									37,350	30	2.94%	94%	0.83	0.15	0.1	2,100	190	1.535%	94%	2.92	0.52	8.1	3.25	40150	4.47	60000	40,150	0.00	0.00	0.66	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-12	700	0	1.535%	94%	0.00	0.00	0.0									37,350	30	2.94%	94%	0.83	0.15	0.1	2,100	190	1.535%	94%	2.92	0.52	8.1	3.25	40150	4.47	60000	40,150	0.00	0.00	0.66	0.0	0.7	0.1	0.18	0.48	0.15	1.23	1.44	4.28	
Dec-12	700	0	1.535%	100%	0.00	0.00	0.0									37,350	30	2.94%	100%	0.88	0.16	0.1	2,100	190	1.535%	100%	2.92	0.52	8.1	3.25	40150	4.47	60000	40,150	0.15	0.48	0.67	0.0	1.2	0.3	0.32	0.84	0.26	1.66	1.85	4.91	
Jan-13	700	0	1.535%	91%	0.00	0.00	0.0									37,300	17	2.94%	91%	0.45	0.08	0.1	4,500	376	1.535%	91%	5.77	1.02	7.5	3.25	42500	4.54	60000	42,500	0.26	0.84	1.10	0.0	1.9	0.4	0.55	1.39	0.43	2.19	2.32	5.56	
Feb-13	700	0	1.535%	94%	0.00	0.00	0.0									37,300	17	2.94%	94%	0.46	0.08	0.1	4,500	376	1.535%	94%	5.77	1.02	7.5	3.25	42500	4.54	60000	42,500	0.43	1.39	1.10	0.0	2.5	0.5	0.71	1.78	0.55	2.52	2.60	5.91	
Mar-13	700	0	1.535%	93%	0.00	0.00	0.0									37,300	17	2.94%	93%	0.46	0.08	0.1	4,500	376	1.535%	93%	5.77	1.02	7.5	3.25	42500	4.54	60000	42,500	0.55	1.78	1.10	0.0	2.9	0.6	0.82	2.07	0.64	2.73	2.77	6.13	
Apr-13	700	0	1.535%	117%	0.00	0.00	0.0									37,300	17	2.94%	117%	0.57	0.10	0.1	4,500	376	1.535%	117%	5.77	1.02	7.5	3.25	42500	4.54	60000	42,500	0.64	2.07	1.12	1.0	2.2	0.5	0.62	1.57	0.48	2.34	2.45	5.73	
May-13	700	0	1.535%	116%	0.00	0.00	0.0									37,300	17	2.94%	116%	0.57	0.10	0.1	4,500	376	1.535%	116%	5.77	1.02	7.5	3.25	42500	4.54	60000	42,500	0.48	1.57	1.12	2.0	0.7	0.2	0.20	0.49	0.15	1.24	1.45	4.30	
Jun-13	700	0	1.535%	111%	0.00	0.00	0.0									37,300	17	2.94%	111%	0.54	0.10	0.1	4,500	376	1.535%	111%	5.77	1.02	7.5	3.25	42500	4.54	60000	42,500	0.15	0.49	1.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-13	700	0	1.535%	87%	0.00	0.00	0.0									37,300	17	2.94%	87%	0.42	0.08	0.1	4,500	376	1.535%	87%	5.77	1.02	7.5	3.25	42500	4.54	60000	42,500	0.00	0.00	1.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-13	700	0	1.535%	91%	0.00	0.00	0.0									37,300	17	2.94%	91%	0.45	0.08	0.1	4,500	376	1.535%	91%	5.77	1.02	7.5	3.25	42500	4.54	60000	42,500	0.00	0.00	1.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-13	700	0	1.535%	111%	0.00	0.00	0.0									37,300	17	2.94%	111%	0.54	0.10	0.1	4,500	376	1.535%	111%	5.77	1.02	7.5	3.25	42500	4.54	60000	42,500	0.00	0.00	1.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-13	700	0	1.535%	94%	0.00	0.00	0.0									37,300	17	2.94%	94%	0.46	0.08	0.1	4,500	376	1.535%	94%	5.77	1.02	7.5	3.25	42500	4.54	60000	42,500	0.00	0.00	1.10	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-13	700	0	1.535%	94%	0.00	0.00	0.0									37,300	17	2.94%	94%	0.46	0.08	0.1	4,500	376	1.535%	94%	5.77	1.02	7.5	3.25	42500	4.54	60000	42,500	0.00	0.00	1.10	0.0	1.1	0.2	0.31	0.79	0.24	1.61	1.80	4.83	
Dec-13	700	0	1.535%	100%	0.00	0.00	0.0									37,300	17	2.94%	100%	0.49	0.09	0.1	4,500	376	1.535%	100%	5.77	1.02	7.5	3.25	42500	4.54	60000	42,500	0.24	0.79	1.11	0.0	1.9	0.4	0.54	1.36	0.42	2.17	2.30	5.53	
Jan-14	700	0	1.535%	91%	0.00	0.00	0.0									38,950	21	2.94%	91%	0.56	0.10	0.1	7,200	468	1.535%	91%	7.17	1.27	5.8	3.25	46850	4.68	60000	46,850	0.42	1.36	1.37	0.0	2.7	0.6	0.83	1.90	0.58	2.60	2.67	6.00	
Feb-14	700	0	1.535%	94%	0.00	0.00	0.0									38,950	21	2.94%	94%	0.58	0.10	0.1	7,200	468	1.535%	94%	7.17	1.27	5.8	3.25	46850	4.68	60000	46,850	0.58	1.90	1.37	0.0	3.3	0.7	1.00	2.27	0.70	2.88	2.90	6.28	
Mar-14	700	0	1.535%	93%	0.00	0.00	0.0									38,950	21	2.94%	93%	0.57	0.10	0.1	7,200	468	1.535%	93%	7.17	1.27	5.8	3.25	46850	4.68	60000	46,850	0.70	2.27	1.37	0.0	3.6	0.8	1.11	2.53	0.78	3.05	3.04	6.45	
Apr-14	700	0	1.535%	117%	0.00	0.00	0.0									38,950	21	2.94%	117%	0.71	0.13	0.1	7,200	468	1.535%	117%	7.17	1.27	5.8	3.25	46850	4.68	60000	46,850	0.78	2.53	1.40	1.0	2.9	0.6	0.89	2.04	0.63	2.71	2.76	6.11	
May-14	700	0	1.535%	116%	0.00	0.00	0.0									38,950	21	2.94%	116%	0.71	0.13	0.1	7,200	468	1.535%	116%	7.17	1.27	5.8	3.25	46850	4.68	60000	46,850	0.63	2.04	1.40	2.0	1.4	0.3	0.44	1.00	0.31	1.83	2.00	5.12	
Jun-14	700	0	1.535%	111%	0.00	0.00	0.0									38,950	21	2.94%	111%	0.68	0.12	0.1	7,200	468	1.535%	111%	7.17	1.27	5.8	3.25	46850	4.68	60000	46,850	0.31	1.00	1.39	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-14	700	0	1.535%	87%	0.00	0.00	0.0									38,950	21	2.94%	87%	0.53	0.09	0.1	7,200	468	1.535%	87%	7.17	1.27	5.8	3.25	46850	4.68	60000	46,850	0.00	0.00	1.37	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-14	700	0	1.535%	91%	0.00	0.00	0.0									38,950	21	2.94%	91%	0.56	0.10	0.1	7,200	468	1.535%	91%	7.17	1.27	5.8	3.25	46850	4.68	60000	46,850	0.00	0.00	1.37	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-14	700	0	1.535%	111%	0.00	0.00	0.0									38,950	21	2.94%	111%	0.68	0.12	0.1	7,200	468	1.535%	111%	7.17	1.27	5.8	3.25	46850	4.68	60000	46,850	0.00	0.00	1.39	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-14	700	0	1.535%	94%	0.00	0.00	0.0									38,950	21	2.94%	94%	0.58	0.10	0.1	7,200	468	1.535%	94%	7.17	1.27	5.8	3.25	46850	4.68	60000	46,850	0.00	0.00	1.37	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-14	700	0	1.535%	94%	0.00	0.00	0.0									38,950	21	2.94%	94%	0.58	0.10	0.1	7,200	468	1.535%	94%	7.17	1.27	5.8	3.25	46850	4.68	60000	46,850	0.00	0.00	1.37	0.0	1.4	0.3	0.42	0.96	0.29	1.78	1.96	5.07	
Dec-14	700	0	1.535%	100%	0.00	0.00	0.0									38,950	21	2.94%	100%	0.61	0.11	0.1	7,200	468	1.535%	100%	7.17	1.27	5.8	3.25	46850	4.68	60000	46,850	0.29	0.96	1.38	0.0	2.3	0.5	0.71	1.62	0.50	2.39	2.49	5.78	
Jan-15	700	0	1.535%	91%	0.00	0.00	0.0									40,600	28	2.94%	91%	0.76	0.13	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	41300	4.51	60000	41,300	0.50	1.62	0.13	0.0	1.8	0.4	0.49	1.27	0.39	2.09	2.23	5.43	
Feb-15	700	0	1.535%	94%	0.00	0.00	0.0									40,600	28	2.94%	94%	0.79	0.14	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	41300	4.51	60000	41,300	0.39	1.27	0.14	0.0	1.4	0.3	0.39	1.01	0.31	1.85	2.01	5.14	
Mar-15	700	0	1.535%	93%	0.00	0.00	0.0									40,600	28	2.94%	93%	0.78	0.14	0.1	0	0	1.535%	93%	0.00	0.00	0.0	3.25	41300	4.51	60000	41,300	0.31	1.01	0.14	0.0	1.2	0.3	0.32	0.83	0.26	1.65	1.84	4.90	
Apr-15	700	0	1.535%	117%	0.00	0.00	0.0									40,600	28	2.94%	117%	0.97	0.17	0.1	0	0	1.535%	117%	0.00	0.00	0.0	3.25	41300	4.51	60000	41,300	0.26	0.83	0.17	1.0	0.0	0.0	0.00	0.00	0.00	0.07	0.14	1.17	
May-15	700	0	1.535%	116%	0.00	0.00	0.0									40,600	28	2.94%	116%	0.96	0.17	0.1	0	0	1.535%	116%	0.00	0.00	0.0	3.25	41300	4.51	60000	41,300	0.00	0.00	0.17	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-15	700	0	1.535%	111%	0.00	0.00	0.0									40,600	28	2.94%	111%	0.93	0.16	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	41300	4.51	60000	41,300	0.00	0.00	0.16	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-15	700	0	1.535%	87%	0.00	0.00	0.0									40,600	28	2.94%	87%	0.72	0.13	0.1	0	0	1.535%	87%	0.00	0.00	0.0	3.25	41300	4.51	60000	41,300	0.00	0.00	0.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-15	700	0	1.535%	91%	0.00	0.00	0.0									40,600	28	2.94%	91%	0.76	0.13	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	41300	4.51	60000	41,300	0.00	0.00	0.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-15	700	0	1.535%	111%	0.00	0.00	0.0									40,600	28	2.94%	111%	0.93	0.16	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	41300	4.51	60000	41,300	0.00	0.00	0.16	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-15	700	0	1.535%	94%	0.00	0.00	0.0									40,600	28	2.94%	94%	0.79	0.14	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	41300	4.51	60000	41,300	0.00	0.00	0.14	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-15	700	0	1.535%	94%	0.00	0.00	0.0									40,600	28	2.94%	94%	0.79	0.14	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	41300	4.51	60000	41,300	0.00	0.00	0.14	0.0	0.1	0.0	0.04	0.10	0.03	0.52	0.71	2.90	
Dec-15	700	0	1.535%	100%	0.00	0.00	0.0									40,600	28	2.94%	100%	0.83	0.15	0.1	0	0	1.535%	100%	0.00	0.00	0.0	3.25	41300	4.51	60000	41,300	0.03	0.10	0.15	0.0	0.2	0.1	0.07	0.18	0.06	0.71	0.92	3.35	
Jan-16	700	0	1.535%	91%	0.00	0.00	0.0									40,000	31	2.94%	91%	0.83	0.15	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.06	0.18	0.15	0.0	0.3	0.1	0.09	0.24	0.07	0.83	1.04	3.58	
Feb-16	700	0	1.535%	94%	0.00	0.00	0.0									40,000	31	2.94%	94%	0.86	0.15	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.07	0.24	0.15	0.0	0.4	0.1	0.11	0.28	0.09	0.91	1.13	3.74	
Mar-16	700	0	1.535%	93%	0.00	0.00	0.0									40,000	31	2.94%	93%	0.85	0.15	0.1	0	0	1.535%	93%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.09	0.28	0.15	0.0	0.4	0.1	0.12	0.31	0.10	0.96	1.18	3.84	

WLWB Ammonia Model - Lowest Practical Case

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154						
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)
Apr-16	700	0	1.535%	117%	0.00	0.00	0.0									40,000	31	2.94%	117%	1.06	0.19	0.2
May-16	700	0	1.535%	116%	0.00	0.00	0.0									40,000	31	2.94%	116%	1.05	0.19	0.2
Jun-16	700	0	1.535%	111%	0.00	0.00	0.0									40,000	31	2.94%	111%	1.01	0.18	0.1
Jul-16	700	0	1.535%	87%	0.00	0.00	0.0									40,000	31	2.94%	87%	0.79	0.14	0.1
Aug-16	700	0	1.535%	91%	0.00	0.00	0.0									40,000	31	2.94%	91%	0.83	0.15	0.1
Sep-16	700	0	1.535%	111%	0.00	0.00	0.0									40,000	31	2.94%	111%	1.01	0.18	0.1
Oct-16	700	0	1.535%	94%	0.00	0.00	0.0									40,000	31	2.94%	94%	0.86	0.15	0.1
Nov-16	700	0	1.535%	94%	0.00	0.00	0.0									40,000	31	2.94%	94%	0.86	0.15	0.1
Dec-16	700	0	1.535%	100%	0.00	0.00	0.0									40,000	31	2.94%	100%	0.91	0.16	0.1
Jan-17	700	0	1.535%	91%	0.00	0.00	0.0									39,500	38	2.94%	91%	1.00	0.18	0.1
Feb-17	700	0	1.535%	94%	0.00	0.00	0.0									39,500	38	2.94%	94%	1.04	0.18	0.2
Mar-17	700	0	1.535%	93%	0.00	0.00	0.0									39,500	38	2.94%	93%	1.03	0.18	0.2
Apr-17	700	0	1.535%	117%	0.00	0.00	0.0									39,500	38	2.94%	117%	1.29	0.23	0.2
May-17	700	0	1.535%	116%	0.00	0.00	0.0									39,500	38	2.94%	116%	1.27	0.23	0.2
Jun-17	700	0	1.535%	111%	0.00	0.00	0.0									39,500	38	2.94%	111%	1.23	0.22	0.2
Jul-17	700	0	1.535%	87%	0.00	0.00	0.0									39,500	38	2.94%	87%	0.96	0.17	0.1
Aug-17	700	0	1.535%	91%	0.00	0.00	0.0									39,500	38	2.94%	91%	1.00	0.18	0.1
Sep-17	700	0	1.535%	111%	0.00	0.00	0.0									39,500	38	2.94%	111%	1.23	0.22	0.2
Oct-17	700	0	1.535%	94%	0.00	0.00	0.0									39,500	38	2.94%	94%	1.04	0.18	0.2
Nov-17	700	0	1.535%	94%	0.00	0.00	0.0									39,500	38	2.94%	94%	1.04	0.18	0.2
Dec-17	700	0	1.535%	100%	0.00	0.00	0.0									39,500	38	2.94%	100%	1.10	0.20	0.2
Jan-18	700	0	1.535%	91%	0.00	0.00	0.0									39,000	37	2.94%	91%	0.98	0.17	0.1
Feb-18	700	0	1.535%	94%	0.00	0.00	0.0									39,000	37	2.94%	94%	1.02	0.18	0.2
Mar-18	700	0	1.535%	93%	0.00	0.00	0.0									39,000	37	2.94%	93%	1.01	0.18	0.2
Apr-18	700	0	1.535%	117%	0.00	0.00	0.0									39,000	37	2.94%	117%	1.26	0.22	0.2
May-18	700	0	1.535%	116%	0.00	0.00	0.0									39,000	37	2.94%	116%	1.25	0.22	0.2
Jun-18	700	0	1.535%	111%	0.00	0.00	0.0									39,000	37	2.94%	111%	1.20	0.21	0.2
Jul-18	700	0	1.535%	87%	0.00	0.00	0.0									39,000	37	2.94%	87%	0.93	0.17	0.1
Aug-18	700	0	1.535%	91%	0.00	0.00	0.0									39,000	37	2.94%	91%	0.98	0.17	0.1
Sep-18	700	0	1.535%	111%	0.00	0.00	0.0									39,000	37	2.94%	111%	1.20	0.21	0.2
Oct-18	700	0	1.535%	94%	0.00	0.00	0.0									39,000	37	2.94%	94%	1.02	0.18	0.2
Nov-18	700	0	1.535%	94%	0.00	0.00	0.0									39,000	37	2.94%	94%	1.02	0.18	0.2
Dec-18	700	0	1.535%	100%	0.00	0.00	0.0									39,000	37	2.94%	100%	1.08	0.19	0.2
Jan-19	700	0	1.535%	91%	0.00	0.00	0.0									38,500	33	2.94%	91%	0.87	0.15	0.1
Feb-19	700	0	1.535%	94%	0.00	0.00	0.0									38,500	33	2.94%	94%	0.90	0.16	0.1
Mar-19	700	0	1.535%	93%	0.00	0.00	0.0									38,500	33	2.94%	93%	0.89	0.16	0.1
Apr-19	700	0	1.535%	117%	0.00	0.00	0.0									38,500	33	2.94%	117%	1.11	0.20	0.2
May-19	700	0	1.535%	116%	0.00	0.00	0.0									38,500	33	2.94%	116%	1.10	0.20	0.2
Jun-19	700	0	1.535%	111%	0.00	0.00	0.0									38,500	33	2.94%	111%	1.06	0.19	0.2
Jul-19	700	0	1.535%	87%	0.00	0.00	0.0									38,500	33	2.94%	87%	0.83	0.15	0.1
Aug-19	700	0	1.535%	91%	0.00	0.00	0.0									38,500	33	2.94%	91%	0.87	0.15	0.1
Sep-19	700	0	1.535%	111%	0.00	0.00	0.0									38,500	33	2.94%	111%	1.06	0.19	0.2
Oct-19	700	0	1.535%	94%	0.00	0.00	0.0									38,500	33	2.94%	94%	0.90	0.16	0.1
Nov-19	700	0	1.535%	94%	0.00	0.00	0.0									38,500	33	2.94%	94%	0.90	0.16	0.1
Dec-19	700	0	1.535%	100%	0.00	0.00	0.0									38,500	33	2.94%	100%	0.96	0.17	0.1
Jan-20	700	0	1.535%	91%	0.00	0.00	0.0									42,600	38	2.94%	91%	1.03	0.18	0.1
Feb-20	700	0	1.535%	94%	0.00	0.00	0.0									42,600	38	2.94%	94%	1.06	0.19	0.1
Mar-20	700	0	1.535%	93%	0.00	0.00	0.0									42,600	38	2.94%	93%	1.05	0.19	0.1
Apr-20	700	0	1.535%	117%	0.00	0.00	0.0									42,600	38	2.94%	117%	1.31	0.23	0.2
May-20	700	0	1.535%	116%	0.00	0.00	0.0									42,600	38	2.94%	116%	1.30	0.23	0.2
Jun-20	700	0	1.535%	111%	0.00	0.00	0.0									42,600	38	2.94%	111%	1.25	0.22	0.2
Jul-20	700	0	1.535%	87%	0.00	0.00	0.0									42,600	38	2.94%	87%	0.98	0.17	0.1
Aug-20	700	0	1.535%	91%	0.00	0.00	0.0									42,600	38	2.94%	91%	1.03	0.18	0.1

	SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Apr-16	0	0	1.535%	117%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.10	0.31	0.19	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-16	0	0	1.535%	116%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.19	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-16	0	0	1.535%	111%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-16	0	0	1.535%	87%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.14	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-16	0	0	1.535%	91%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.15	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-16	0	0	1.535%	111%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-16	0	0	1.535%	94%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.15	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-16	0	0	1.535%	94%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.00	0.00	0.15	0.0	0.2	0.0	0.04	0.11	0.03	0.54	0.74	2.97	
Dec-16	0	0	1.535%	100%	0.00	0.00	0.0	3.25	40700	4.49	60000	40,700	0.03	0.11	0.16	0.0	0.3	0.1	0.07	0.20	0.06	0.75	0.96	3.42	
Jan-17	0	0	1.535%	91%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.06	0.20	0.18	0.0	0.4	0.1	0.10	0.27	0.08	0.89	1.11	3.71	
Feb-17	0	0	1.535%	94%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.08	0.27	0.18	0.0	0.5	0.1	0.12	0.33	0.10	1.00	1.22	3.90	
Mar-17	0	0	1.535%	93%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.10	0.33	0.18	0.0	0.5	0.1	0.14	0.37	0.11	1.06	1.28	4.02	
Apr-17	0	0	1.535%	117%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.11	0.37	0.23	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-17	0	0	1.535%	116%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.23	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-17	0	0	1.535%	111%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-17	0	0	1.535%	87%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.17	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-17	0	0	1.535%	91%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-17	0	0	1.535%	111%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-17	0	0	1.535%	94%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.18	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-17	0	0	1.535%	94%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.00	0.00	0.18	0.0	0.2	0.0	0.05	0.13	0.04	0.61	0.81	3.12	
Dec-17	0	0	1.535%	100%	0.00	0.00	0.0	3.25	40200	4.47	60000	40,200	0.04	0.13	0.20	0.0	0.3	0.1	0.09	0.24	0.07	0.83	1.05	3.60	
Jan-18	0	0	1.535%	91%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.07	0.24	0.17	0.0	0.4	0.1	0.11	0.30	0.09	0.95	1.17	3.81	
Feb-18	0	0	1.535%	94%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.09	0.30	0.18	0.0	0.5	0.1	0.13	0.35	0.11	1.03	1.25	3.96	
Mar-18	0	0	1.535%	93%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.11	0.35	0.18	0.0	0.5	0.1	0.14	0.39	0.12	1.08	1.30	4.05	
Apr-18	0	0	1.535%	117%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.12	0.39	0.22	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-18	0	0	1.535%	116%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.22	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-18	0	0	1.535%	111%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.21	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-18	0	0	1.535%	87%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.17	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-18	0	0	1.535%	91%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.17	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-18	0	0	1.535%	111%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.21	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-18	0	0	1.535%	94%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.18	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-18	0	0	1.535%	94%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.00	0.00	0.18	0.0	0.2	0.0	0.05	0.13	0.04	0.60	0.80	3.10	
Dec-18	0	0	1.535%	100%	0.00	0.00	0.0	3.25	39700	4.46	60000	39,700	0.04	0.13	0.19	0.0	0.3	0.1	0.09	0.24	0.07	0.83	1.04	3.58	
Jan-19	0	0	1.535%	91%	0.00	0.00	0.0	3.25	39200	4.44	60000	39,200	0.07	0.24	0.15	0.0	0.4	0.1	0.10	0.28	0.09	0.92	1.14	3.76	
Feb-19	0	0	1.535%	94%	0.00	0.00	0.0	3.25	39200	4.44	60000	39,200	0.09	0.28	0.16	0.0	0.4	0.1	0.12	0.33	0.10	0.99	1.21	3.88	
Mar-19	0	0	1.535%	93%	0.00	0.00	0.0	3.25	39200	4.44	60000	39,200	0.10	0.33	0.16	0.0	0.5	0.1	0.13	0.35	0.11	1.03	1.25	3.96	
Apr-19	0	0	1.535%	117%	0.00	0.00	0.0	3.25	39200	4.44	60000	39,200	0.11	0.35	0.20	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-19	0	0	1.535%	116%	0.00	0.00	0.0	3.25	39200	4.44	60000	39,200	0.00	0.00	0.20	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-19	0	0	1.535%	111%	0.00	0.00	0.0	3.25	39200	4.44	60000	39,200	0.00	0.00	0.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-19	0	0	1.535%	87%	0.00	0.00	0.0	3.25	39200	4.44	60000	39,200	0.00	0.00	0.15	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-19	0	0	1.535%	91%	0.00	0.00	0.0	3.25	39200	4.44	60000	39,200	0.00	0.00	0.15	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-19	0	0	1.535%	111%	0.00	0.00	0.0	3.25	39200	4.44	60000	39,200	0.00	0.00	0.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-19	0	0	1.535%	94%	0.00	0.00	0.0	3.25	39200	4.44	60000	39,200	0.00	0.00	0.16	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-19	0	0	1.535%	94%	0.00	0.00	0.0	3.25	39200	4.44	60000	39,200	0.00	0.00	0.16	0.0	0.2	0.0	0.04	0.12	0.04	0.56	0.76	3.01	
Dec-19	0	0	1.535%	100%	0.00	0.00	0.0	3.25	39200	4.44	60000	39,200	0.04	0.12	0.17	0.0	0.3	0.1	0.08	0.21	0.06	0.77	0.99	3.48	
Jan-20	0	0	1.535%	91%	0.00	0.00	0.0	3.25	43300	4.57	60000	43,300	0.06	0.21	0.18	0.0	0.4	0.1	0.11	0.28	0.09	0.91	1.13	3.74	
Feb-20	0	0	1.535%	94%	0.00	0.00	0.0	3.25	43300	4.57	60000	43,300	0.09	0.28	0.19	0.0	0.5	0.1	0.13	0.33	0.10	1.00	1.22	3.90	
Mar-20	0	0	1.535%	93%	0.00	0.00	0.0	3.25	43300	4.57	60000	43,300	0.10	0.33	0.19	0.0	0.5	0.1	0.15	0.37	0.11	1.06	1.28	4.00	
Apr-20	0	0	1.535%	117%	0.00	0.00	0.0	3.25	43300	4.57	60000	43,300	0.11	0.37	0.23	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-20	0	0	1.535%	116%	0.00	0.00	0.0	3.25	43300	4.57	60000	43,300	0.00	0.00	0.23	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-20	0	0	1.535%	111%	0.00	0.00	0.0	3.25	43300	4.57	60000	43,300	0.00	0.00	0.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-20	0	0	1.535%	87%	0.00	0.00	0.0	3.25	43300	4.57	60000	43,300	0.00	0.00	0.17	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-20	0	0	1.535%	91%	0.00	0.00	0.0	3.25	43300	4.57	60000	43,300	0.00	0.00	0.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Lowest Practical Case

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L	Actual NH4-N concentration (mg/L)
Sep-20	700	0	1.535%	111%	0.00	0.00	0.0									42,600	38	2.94%	111%	1.25	0.22	0.2	0	0	1.535%	111%	0.00	0.00	0.0	3.25	43300	4.57	60000	43,300	0.00	0.00	0.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-20	700	0	1.535%	94%	0.00	0.00	0.0									42,600	38	2.94%	94%	1.06	0.19	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	43300	4.57	60000	43,300	0.00	0.00	0.19	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-20	700	0	1.535%	94%	0.00	0.00	0.0									42,600	38	2.94%	94%	1.06	0.19	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	43300	4.57	60000	43,300	0.00	0.00	0.19	0.0	0.2	0.0	0.05	0.13	0.04	0.61	0.81	3.12	
Dec-20	700	0	1.535%	100%	0.00	0.00	0.0									42,600	38	2.94%	100%	1.13	0.20	0.2	0	0	1.535%	100%	0.00	0.00	0.0	3.25	43300	4.57	60000	43,300	0.04	0.13	0.20	0.0	0.3	0.1	0.10	0.24	0.07	0.83	1.05	3.59	
Jan-21	700	0	1.535%	91%	0.00	0.00	0.0									46,800	40	2.94%	91%	1.07	0.19	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	47500	4.69	60000	47,500	0.07	0.24	0.19	0.0	0.4	0.1	0.13	0.30	0.09	0.94	1.16	3.79	
Feb-21	700	0	1.535%	94%	0.00	0.00	0.0									46,800	40	2.94%	94%	1.11	0.20	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	47500	4.69	60000	47,500	0.09	0.30	0.20	0.0	0.5	0.1	0.15	0.34	0.10	1.01	1.23	3.93	
Mar-21	700	0	1.535%	93%	0.00	0.00	0.0									46,800	40	2.94%	93%	1.10	0.19	0.1	0	0	1.535%	93%	0.00	0.00	0.0	3.25	47500	4.69	60000	47,500	0.10	0.34	0.19	0.0	0.5	0.1	0.16	0.37	0.11	1.06	1.28	4.01	
Apr-21	700	0	1.535%	117%	0.00	0.00	0.0									46,800	40	2.94%	117%	1.37	0.24	0.2	0	0	1.535%	117%	0.00	0.00	0.0	3.25	47500	4.69	60000	47,500	0.11	0.37	0.24	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-21	700	0	1.535%	116%	0.00	0.00	0.0									46,800	40	2.94%	116%	1.36	0.24	0.2	0	0	1.535%	116%	0.00	0.00	0.0	3.25	47500	4.69	60000	47,500	0.00	0.00	0.24	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-21	700	0	1.535%	111%	0.00	0.00	0.0									46,800	40	2.94%	111%	1.31	0.23	0.2	0	0	1.535%	111%	0.00	0.00	0.0	3.25	47500	4.69	60000	47,500	0.00	0.00	0.23	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-21	700	0	1.535%	87%	0.00	0.00	0.0									46,800	40	2.94%	87%	1.02	0.18	0.1	0	0	1.535%	87%	0.00	0.00	0.0	3.25	47500	4.69	60000	47,500	0.00	0.00	0.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-21	700	0	1.535%	91%	0.00	0.00	0.0									46,800	40	2.94%	91%	1.07	0.19	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	47500	4.69	60000	47,500	0.00	0.00	0.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-21	700	0	1.535%	111%	0.00	0.00	0.0									46,800	40	2.94%	111%	1.31	0.23	0.2	0	0	1.535%	111%	0.00	0.00	0.0	3.25	47500	4.69	60000	47,500	0.00	0.00	0.23	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-21	700	0	1.535%	94%	0.00	0.00	0.0									46,800	40	2.94%	94%	1.11	0.20	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	47500	4.69	60000	47,500	0.00	0.00	0.20	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-21	700	0	1.535%	94%	0.00	0.00	0.0									46,800	40	2.94%	94%	1.11	0.20	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	47500	4.69	60000	47,500	0.00	0.00	0.20	0.0	0.2	0.0	0.06	0.14	0.04	0.61	0.82	3.13	
Dec-21	700	0	1.535%	100%	0.00	0.00	0.0									46,800	40	2.94%	100%	1.18	0.21	0.1	0	0	1.535%	100%	0.00	0.00	0.0	3.25	47500	4.69	60000	47,500	0.04	0.14	0.21	0.0	0.3	0.1	0.11	0.24	0.07	0.83	1.05	3.59	
Jan-22	700	0	1.535%	91%	0.00	0.00	0.0									42,200	32	2.94%	91%	0.85	0.15	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	42900	4.55	60000	42,900	0.07	0.24	0.15	0.0	0.4	0.1	0.11	0.28	0.09	0.90	1.12	3.73	
Feb-22	700	0	1.535%	94%	0.00	0.00	0.0									42,200	32	2.94%	94%	0.88	0.16	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	42900	4.55	60000	42,900	0.09	0.28	0.16	0.0	0.4	0.1	0.12	0.31	0.10	0.96	1.18	3.83	
Mar-22	700	0	1.535%	93%	0.00	0.00	0.0									42,200	32	2.94%	93%	0.87	0.15	0.1	0	0	1.535%	93%	0.00	0.00	0.0	3.25	42900	4.55	60000	42,900	0.10	0.31	0.15	0.0	0.5	0.1	0.13	0.33	0.10	1.00	1.22	3.90	
Apr-22	700	0	1.535%	117%	0.00	0.00	0.0									42,200	32	2.94%	117%	1.09	0.19	0.1	0	0	1.535%	117%	0.00	0.00	0.0	3.25	42900	4.55	60000	42,900	0.10	0.33	0.19	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-22	700	0	1.535%	116%	0.00	0.00	0.0									42,200	32	2.94%	116%	1.08	0.19	0.1	0	0	1.535%	116%	0.00	0.00	0.0	3.25	42900	4.55	60000	42,900	0.00	0.00	0.19	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-22	700	0	1.535%	111%	0.00	0.00	0.0									42,200	32	2.94%	111%	1.03	0.18	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	42900	4.55	60000	42,900	0.00	0.00	0.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-22	700	0	1.535%	87%	0.00	0.00	0.0									42,200	32	2.94%	87%	0.81	0.14	0.1	0	0	1.535%	87%	0.00	0.00	0.0	3.25	42900	4.55	60000	42,900	0.00	0.00	0.14	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-22	700	0	1.535%	91%	0.00	0.00	0.0									42,200	32	2.94%	91%	0.85	0.15	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	42900	4.55	60000	42,900	0.00	0.00	0.15	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-22	700	0	1.535%	111%	0.00	0.00	0.0									42,200	32	2.94%	111%	1.03	0.18	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	42900	4.55	60000	42,900	0.00	0.00	0.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-22	700	0	1.535%	94%	0.00	0.00	0.0									42,200	32	2.94%	94%	0.88	0.16	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	42900	4.55	60000	42,900	0.00	0.00	0.16	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-22	700	0	1.535%	94%	0.00	0.00	0.0									42,200	32	2.94%	94%	0.88	0.16	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	42900	4.55	60000	42,900	0.00	0.00	0.16	0.0	0.2	0.0	0.04	0.11	0.03	0.55	0.74	2.93	
Dec-22	700	0	1.535%	100%	0.00	0.00	0.0									42,200	32	2.94%	100%	0.93	0.16	0.1	0	0	1.535%	100%	0.00	0.00	0.0	3.25	42900	4.55	60000	42,900	0.03	0.11	0.16	0.0	0.3	0.1	0.08	0.20	0.06	0.75	0.96	3.43	
Jan-23	700	0	1.535%	91%	0.00	0.00	0.0									37,700	35	2.94%	91%	0.94	0.17	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	38400	4.42	60000	38,400	0.06	0.20	0.17	0.0	0.4	0.1	0.10	0.27	0.08	0.89	1.10	3.70	
Feb-23	700	0	1.535%	94%	0.00	0.00	0.0									37,700	35	2.94%	94%	0.97	0.17	0.2	0	0	1.535%	94%	0.00	0.00	0.0	3.25	38400	4.42	60000	38,400	0.08	0.27	0.17	0.0	0.4	0.1	0.12	0.32	0.10	0.98	1.20	3.88	
Mar-23	700	0	1.535%	93%	0.00	0.00	0.0									37,700	35	2.94%	93%	0.96	0.17	0.1	0	0	1.535%	93%	0.00	0.00	0.0	3.25	38400	4.42	60000	38,400	0.10	0.32	0.17	0.0	0.5	0.1	0.13	0.36	0.11	1.05	1.27	3.99	
Apr-23	700	0	1.535%	117%	0.00	0.00	0.0									37,700	35	2.94%	117%	1.20	0.21	0.2	0	0	1.535%	117%	0.00	0.00	0.0	3.25	38400	4.42	60000	38,400	0.11	0.36	0.21	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-23	700	0	1.535%	116%	0.00	0.00	0.0									37,700	35	2.94%	116%	1.19	0.21	0.2	0	0	1.535%	116%	0.00	0.00	0.0	3.25	38400	4.42	60000	38,400	0.00	0.00	0.21	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-23	700	0	1.535%	111%	0.00	0.00	0.0									37,700	35	2.94%	111%	1.14	0.20	0.2	0	0	1.535%	111%	0.00	0.00	0.0	3.25	38400	4.42	60000	38,400	0.00	0.00	0.20	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-23	700	0	1.535%	87%	0.00	0.00	0.0									37,700	35	2.94%	87%	0.89	0.16	0.1	0	0	1.535%	87%	0.00	0.00	0.0	3.25	38400	4.42	60000	38,400	0.00	0.00	0.16	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-23	700	0	1.535%	91%	0.00	0.00	0.0									37,700	35	2.94%	91%	0.94	0.17	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	38400	4.42	60000	38,400	0.00	0.00	0.17	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-23	700	0	1.535%	111%	0.00	0.00	0.0									37,700	35	2.94%	111%	1.14	0.20	0.2	0	0	1.535%	111%	0.00	0.00	0.0	3.25	38400	4.42	60000	38,400	0.00	0.00	0.20	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-23	700	0	1.535%	94%	0.00	0.00	0.0									37,700	35	2.94%	94%	0.97	0.17	0.2	0	0	1.535%	94%	0.00	0.00	0.0	3.25	38400	4.42	60000	38,400	0.00	0.00	0.17	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-23	700	0	1.535%	94%	0.00	0.00	0.0									37,700	35	2.94%	94%	0.97	0.17	0.2	0	0	1.535%	94%	0.00	0.00	0.0	3.25	38400	4.42	60000	38,400	0.00	0.00	0.17	0.0	0.2	0.0	0.05	0.13	0.04	0.59	0.79	3.07	
Dec-23	700	0	1.535%	100%	0.00	0.00	0.0									37,700	35	2.94%	100%	1.03	0.18	0.2	0	0	1.535%	100%	0.00	0.00	0.0	3.25	38400	4.42	60000	38,400	0.04	0.13	0.18	0.0	0.3	0.1	0.08	0.23	0.07	0.81	1.03	3.55	
Jan-24	700	0	1.535%	91%	0.00	0.00	0.0									38,300	10	2.94%	91%	0.27	0.05	0.0	0	0	1.535%	91%	0.00	0.00	0.0	3.25	39000	4.44	60000	39,000	0.07	0.23	0.05	0.0	0.3	0.1	0.07	0.20	0.06	0.76	0.97	3.45	
Feb-24	700	0	1.535%	94%	0.00	0.00	0.0									38,300	10	2.94%	94%	0.28	0.05	0.0	0	0	1.535%	94%	0.00	0.00	0.0	3.25	39000	4.44	60000	39,000	0.06	0.20	0.05	0.0	0.3	0.1	0.07	0.18	0.06	0.72	0.93	3.37	
Mar-24	700	0	1.535%	93%	0.00	0.00	0.0									38,300	10	2.94%	93%	0.27	0.05	0.0	0	0	1.535%	93%	0.00	0.00	0.0	3.25	39000	4.44	60000	39,000	0.06	0.18	0.05	0.0	0.2	0.1	0.06	0.17	0.05	0.69	0.90	3.31	
Apr-24	700	0	1.535%	117%	0.00	0.00	0.0									38,300	10	2.94%	117%	0.34	0.06	0.1	0	0	1.535%	117%	0.00	0.00	0.0	3.25	39000	4.44	60000	39,000	0.05	0.17	0.06	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-24	700	0	1.535%	116%	0.00	0.00	0.0									38,300	10	2.94%	116%	0.34	0.06	0.1	0	0	1.535%	116%	0.00	0.00	0.0	3.25	39000	4.44	60000	39,000	0.00	0.00	0.06	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-24	700	0	1.535%	111%	0.00	0.00	0.0									38,300	10	2.94%	111%	0.33	0.06	0.0	0	0	1.535%	111%	0.00	0.00	0.0	3.25	39000	4.44	60000	39,000	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-24	700	0	1.535%	87%	0.00	0.00	0.0									38,300	10	2.94%	87%	0.25	0.05	0.0	0	0	1.535%	87%	0.00	0.00	0.0	3.25	39000	4.44	60000	39,000	0.00	0.00	0.05	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-24	700	0	1.535%	91%	0.00	0.00	0.0									38,300	10	2.94%	91%	0.27	0.05	0.0	0	0	1.535%	91%	0.00	0.00	0.0	3.25	39000	4.44	60000	39,000	0.00	0.00	0.05	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-24	700	0	1.535%	111%	0.00	0.00	0.0									38,300	10	2.94%	111%	0.33	0.06	0.0	0	0	1.535%	111%	0.00	0.00	0.0	3.25	39000	4.44	60000	39,000	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-24	700	0	1.535%	94%	0.00	0.00	0.0									38,300	10	2.94%	94%	0.28	0.05	0.0	0	0	1.535%	94%	0.00	0.00	0.0	3.25	39000	4.44	60000	39,000	0.00	0.00	0.05	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-24	700	0	1.535%	94%	0.00	0.00	0.0									38,300	10	2.94%	94%	0.28	0.05	0.0	0	0	1.535%	94%	0.00	0.00	0.0	3.25	39000	4.44	60000	39,000	0.00	0.00	0.05	0.0	0.0	0.0	0.01	0.04	0.01	0.29	0.45	2.25	
Dec-24	700	0	1.535%	100%	0.00	0.00	0.0									38,300	10	2.94%	100%	0.29	0.05	0.0	0	0	1.535%	100%	0.00	0.00	0.0	3.25	39000	4.44	60000	39,000	0.01	0.04	0.05	0.0	0.1	0.0	0.02	0.06	0.02	0.41	0.58	2.60	
Jan-25	700	0	1.535%	91%	0.00	0.00	0.0									38,900	0	2.94%	91%	0.00	0.00	0.0	0	0	1.535%	91%	0.00	0.00	0.0	3.25	39600	4.45	60000	39,600	0.02	0.06	0.00	0.0	0.1	0.0	0.02	0.05	0.01	0.34	0.51	2.41	

WLWB Ammonia Model - Lowest Practical Case

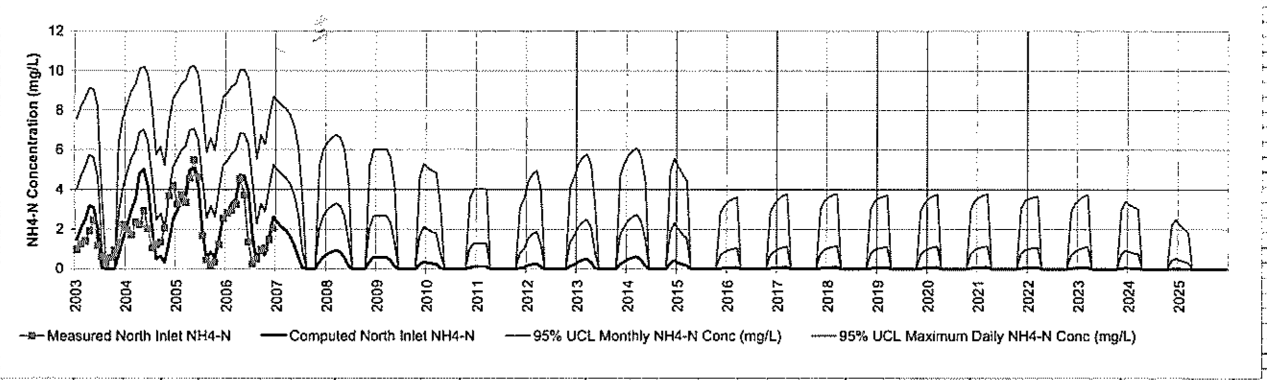
	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Feb-25	700	0	1.535%	94%	0.00	0.00	0.0									38,900	0	2.94%	94%	0.00	0.00	0.0	0	0	1.535%	94%	0.00	0.00	0.0	3.25	39600	4.45	60000	39,600	0.01	0.05	0.00	0.0	0.0	0.0	0.01	0.03	0.01	0.29	0.44	2.23	
Mar-25	700	0	1.535%	93%	0.00	0.00	0.0									38,900	0	2.94%	93%	0.00	0.00	0.0	0	0	1.535%	93%	0.00	0.00	0.0	3.25	39600	4.45	60000	39,600	0.01	0.03	0.00	0.0	0.0	0.0	0.01	0.03	0.01	0.24	0.38	2.06	
Apr-25	700	0	1.535%	117%	0.00	0.00	0.0									38,900	0	2.94%	117%	0.00	0.00	0.0	0	0	1.535%	117%	0.00	0.00	0.0	3.25	39600	4.45	60000	39,600	0.01	0.03	0.00	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-25	700	0	1.535%	116%	0.00	0.00	0.0									38,900	0	2.94%	116%	0.00	0.00	0.0	0	0	1.535%	116%	0.00	0.00	0.0	3.25	39600	4.45	60000	39,600	0.00	0.00	0.00	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-25	700	0	1.535%	111%	0.00	0.00	0.0									38,900	0	2.94%	111%	0.00	0.00	0.0	0	0	1.535%	111%	0.00	0.00	0.0	3.25	39600	4.45	60000	39,600	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-25	700	0	1.535%	87%	0.00	0.00	0.0									38,900	0	2.94%	87%	0.00	0.00	0.0	0	0	1.535%	87%	0.00	0.00	0.0	3.25	39600	4.45	60000	39,600	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-25	700	0	1.535%	91%	0.00	0.00	0.0									38,900	0	2.94%	91%	0.00	0.00	0.0	0	0	1.535%	91%	0.00	0.00	0.0	3.25	39600	4.45	60000	39,600	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-25	700	0	1.535%	111%	0.00	0.00	0.0									38,900	0	2.94%	111%	0.00	0.00	0.0	0	0	1.535%	111%	0.00	0.00	0.0	3.25	39600	4.45	60000	39,600	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-25	700	0	1.535%	94%	0.00	0.00	0.0									38,900	0	2.94%	94%	0.00	0.00	0.0	0	0	1.535%	94%	0.00	0.00	0.0	3.25	39600	4.45	60000	39,600	0.00	0.00	0.00	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-25	700	0	1.535%	94%	0.00	0.00	0.0									38,900	0	2.94%	94%	0.00	0.00	0.0	0	0	1.535%	94%	0.00	0.00	0.0	3.25	39600	4.45	60000	39,600	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-25	700	0	1.535%	100%	0.00	0.00	0.0									38,900	0	2.94%	100%	0.00	0.00	0.0	0	0	1.535%	100%	0.00	0.00	0.0	3.25	39600	4.45	60000	39,600	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Lowest Practical Case with High Flow to A418 Surface Mine

WLWB AMMONIA MANAGEMENT MODEL OF DIAVIK PROJECT

CASE:	**Lowest Practical with High A418 Flow**
BLASTING:	Combo#2: Double prime, improve loading, 80/20 emulsion/ANFO mix; thick emulsion; reduced residence time; PE liner in wet holes; imrove stemming (55% average reduction, 70% peak)
AN USE:	Past and future use as per Diavik ADP projections (SNC-Lavalin, Ammonia Balance, May 2006)
MINE INFLOW:	Actual to present, predicted inflows (Golder, 2006) in future except inflow to A418 surface mine equal to A154 surface mine
WATER MANAGEMENT:	All mine water exept A418 Surface Mine discharged to North Inlet; live capacity of Inlet increased 2 million cubic meters
TREATMENT:	Natural biological treatment in North Inlet to continue with use of mats and greater water capacity.
FLOW TO LAC DE GRAS:	Actual to present, future discharge equal to input in same month.

RESULTS	**FROM BEGINNING OF**	**03**	**07**	**08**
AMMONIA (N) TO LDG	**TO END OF**	**06**	**07**	**25**
	Average	2.3	0.9	0.1
	Maximum 30 Day	5.1	2.3	0.9
	Maximum 1 Day	8.6	5.6	3.4
	Maximum 95% UCL 30 Day	7.1	5.0	3.3
	Maximum 95% UCL 1 Day	10.3	8.5	6.8



WLWB Ammonia Model - Lowest Practical Case with High Flow to A418 Surface Mine

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N Input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L	Actual NH4-N concentration (mg/L)
Jan-03	5,380	867	0.924%	60%	4.80	0.85	5.2	8.4	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	5380	1.41	32000	17,905	1.00	1.25	0.85	0.0	2.1	1.5	0.81	1.29	1.49	4.35	4.06	7.57	1.0
Feb-03	5,667	867	0.924%	75%	6.00	1.06	6.2	7.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	5667	1.42	32000	17,175	1.49	1.86	1.06	0.0	2.9	2.1	1.07	1.85	2.05	5.20	4.70	8.20	1.3
Mar-03	5,954	867	0.924%	70%	5.60	0.99	5.5	5.1	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	5954	1.43	32000	16,854	2.05	2.57	0.99	0.0	3.6	2.5	1.28	2.29	2.49	5.78	5.12	8.60	1.4
Apr-03	6,251	867	0.924%	175%	14.01	2.48	13.0	10.5	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	1.25	6251	1.44	32000	16,875	2.49	3.11	2.48	1.0	4.6	3.2	1.64	2.96	3.19	6.62	5.73	9.14	1.9
May-03	5,936	867	0.924%	170%	13.61	2.41	13.3	5.4	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	1.25	5936	1.43	32000	25,514	3.19	3.99	2.41	2.0	4.4	3.1	2.39	2.01	3.07	6.49	5.64	9.06	2.5
Jun-03	7,290	867	0.924%	150%	12.01	2.13	9.6	3.2	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	7290	1.47	32000	29,485	3.07	3.84	2.13	3.0	3.0	2.0	1.81	1.16	2.02	5.15	4.66	8.16	1.2
Jul-03	6,867	867	0.924%	40%	3.20	0.57	2.7	6.7	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	6867	1.46	32000	28,379	2.02	2.52	0.57	3.0	0.1	0.1	0.05	0.04	0.06	0.76	0.98	3.45	0.6
Aug-03	7,753	867	0.924%	60%	4.80	0.85	3.6	6.1	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	7753	1.49	32000	27,138	0.06	0.08	0.85	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.2
Sep-03	8,194	867	0.924%	150%	12.01	2.13	8.5	8.4	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	8194	1.50	32000	29,865	0.00	0.00	2.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.6
Oct-03	8,775	867	0.924%	75%	6.00	1.06	4.0	6.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	8775	1.52	32000	27,977	0.00	0.00	1.06	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.9
Nov-03	8,935	867	0.924%	75%	6.00	1.06	3.9	6.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	8935	1.52	32000	15,411	0.00	0.00	1.06	0.0	1.1	0.7	0.33	0.74	0.70	2.87	2.89	6.28	1.3
Dec-03	8,301	867	0.924%	100%	8.01	1.42	5.6	5.1	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	8301	1.50	32000	24,385	0.70	0.87	1.42	0.0	2.3	1.5	1.13	1.16	1.53	4.42	4.11	7.62	2.2
Jan-04	8,570	808	1.598%	60%	7.75	1.37	5.3	4.3	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	8570	1.51	32000	13,372	1.53	1.91	1.37	0.0	3.3	2.2	0.88	2.40	2.17	5.36	4.82	8.31	2.0
Feb-04	7,982	808	1.598%	75%	9.69	1.72	7.1	5.9	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	7982	1.49	32000	7,407	2.17	2.71	1.72	0.0	4.4	3.0	0.67	3.76	2.97	6.37	5.55	8.98	1.7
Mar-04	8,828	808	1.598%	70%	9.04	1.60	6.0	6.0	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	8828	1.52	32000	3,826	2.97	3.71	1.60	0.0	5.3	3.5	0.41	4.91	3.50	6.97	5.97	9.35	2.4
Apr-04	9,324	808	1.598%	175%	22.60	4.00	14.1	5.3	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	1.25	9324	1.53	32000	0	3.50	4.37	4.00	1.0	7.4	4.8	0.00	7.38	4.81	8.30	6.89	10.12	2.2
May-04	10,755	808	1.598%	170%	21.95	3.89	11.9	9.3	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	1.25	10755	1.58	32000	0	4.81	6.01	3.89	2.0	7.9	5.0	0.00	7.90	5.01	8.49	7.02	10.22	2.9
Jun-04	12,337	808	1.598%	150%	19.37	3.43	9.1	5.3	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	12337	1.63	32000	16,027	5.01	6.26	3.43	3.0	6.7	4.1	2.01	4.69	4.12	7.63	6.43	9.74	2.0
Jul-04	11,098	808	1.598%	40%	5.17	0.92	2.7	13.4	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	11098	1.59	32000	25,310	4.12	5.15	0.92	3.0	3.1	1.9	1.49	1.58	1.93	5.03	4.57	8.07	1.1
Aug-04	11,394	808	1.598%	60%	7.75	1.37	4.0	8.9	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	11394	1.60	32000	28,658	1.93	2.41	1.37	3.0	0.8	0.5	0.43	0.36	0.49	2.37	2.47	5.76	1.2
Sep-04	12,030	808	1.598%	150%	19.37	3.43	9.4	6.7	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	12030	1.62	32000	27,577	0.49	0.62	3.43	3.0	1.0	0.6	0.54	0.50	0.65	2.76	2.80	6.17	1.3
Oct-04	11,948	808	1.598%	75%	9.69	1.72	4.7	6.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11948	1.61	32000	13,563	0.65	0.81	1.72	2.0	0.5	0.3	0.14	0.39	0.33	1.89	2.06	5.20	2.1
Nov-04	11,300	808	1.598%	75%	9.69	1.72	5.0	7.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11300	1.59	32000	12,590	0.33	0.41	1.72	0.0	2.1	1.3	0.51	1.61	1.33	4.10	3.87	7.37	3.7
Dec-04	10,514	808	1.598%	100%	12.91	2.29	7.2	5.1	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	10514	1.57	32000	11,561	1.33	1.67	2.29	0.0	4.0	2.5	0.89	3.07	2.52	5.82	5.15	8.62	4.2
Jan-05	10,958	725	1.979%	60%	8.61	1.53	4.6	4.5	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	10958	1.58	32000	10,692	2.52	3.15	1.53	0.0	4.7	3.0	0.96	3.72	2.95	6.35	5.53	8.97	3.3
Feb-05	11,359	725	1.979%	75%	10.76	1.91	5.5	4.5	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	11359	1.60	32000	12,385	2.95	3.69	1.91	0.0	5.6	3.5	1.32	4.28	3.51	6.98	5.98	9.38	3.7
Mar-05	12,270	725	1.979%	70%	10.04	1.78	4.8	5.8	0	0	0.000%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	0	0	0.00%	70%	0.00	0.00	0.0	1.25	12270	1.62	32000	12,748	3.51	4.39	1.78	0.0	6.2	3.8	1.47	4.69	3.80	7.29	6.20	9.55	3.4
Apr-05	13,110	725	1.979%	175%	25.11	4.45	11.2	11.5	0	0	0.000%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	0	0	0.00%	175%	0.00	0.00	0.0	1.25	13110	1.65	32000	13,667	3.80	4.75	4.45	1.0	8.2	5.0	2.07	6.13	4.97	8.46	7.00	10.20	4.6
May-05	14,120	725	1.979%	170%	24.39	4.32	10.1	11.7	0	0	0.000%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	0	0	0.00%	170%	0.00	0.00	0.0	1.25	14120	1.68	32000	16,000	4.97	6.22	4.32	2.0	8.5	5.1	2.47	6.06	5.08	8.56	7.07	10.26	5.5
Jun-05	15,045	725	1.979%	150%	21.52	3.81	8.3	10.7	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	15045	1.71	32000	17,531	5.08	6.35	3.81	3.0	7.2	4.2	2.24	4.93	4.20	7.70	6.48	9.79	4.6
Jul-05	15,261	725	1.979%	40%	5.74	1.02	2.2	5.1	0	0	0.000%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	0	0	0.00%	40%	0.00	0.00	0.0	1.25	15261	1.71	32000	8,477	4.20	5.25	1.02	3.0	3.3	1.9	0.49	2.77	1.90	4.99	4.54	8.05	1.7
Aug-05	14,863	725	1.979%	60%	8.61	1.53	3.4	3.3	0	0	0.000%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	0	0	0.00%	60%	0.00	0.00	0.0	1.25	14863	1.70	32000	17,738	1.90	2.38	1.53	3.0	0.9	0.5	0.29	0.62	0.53	2.48	2.56	5.87	0.5
Sep-05	15,820	725	1.979%	150%	21.52	3.81	7.9	2.2	0	0	0.000%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	0	0	0.00%	150%	0.00	0.00	0.0	1.25	15820	1.73	32000	24,395	0.53	0.67	3.81	3.0	1.5	0.9	0.63	0.85	0.86	3.21	3.17	6.60	0.2
Oct-05	15,681	725	1.979%	75%	10.76	1.91	4.0	2.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15681	1.73	32000	21,915	0.86	1.07	1.91	2.0	1.0	0.6	0.38	0.60	0.57	2.56	2.63	5.96	0.3
Nov-05	15,693	725	1.979%	75%	10.76	1.91	4.0	3.6	0	0	0.000%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15693	1.73	32000	17,253	0.57	0.71	1.91	0.0	2.6	1.5	0.79	1.82	1.51	4.40	4.10	7.60	1.2
Dec-05	14,884	725	1.979%	100%	14.35	2.54	5.6	6.3	0	0	0.000%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	0	0	0.00%	100%	0.00	0.00	0.0	1.25	14884	1.70	32000	14,961	1.51	1.89	2.54	0.0	4.4	2.6	1.19	3.25	2.60	5.92	5.23	8.69	2.6
Jan-06	15,584	642	2.256%	60%	8.69	1.54	3.2	3.7	250	0	0.000%	60%	0.00	0.00	0.0	0	46	2.94%	60%	0.81	0.14	#DIV/0!	0	0	0.00%	60%	0.00	0.00	0.0	1.25	15834	1.73	32000	15,041	2.60	3.26	1.68	0.0	4.9	2.9	1.30	3.63	2.85	6.23	5.45	8.89	2.8
Feb-06	15,104	642	2.256%	75%	10.86	1.92	4.2	4.8	250	0	0.000%	75%	0.00	0.00	0.0	0	46	2.94%	75%	1.01	0.18	#DIV/0!	0	0	0.00%	75%	0.00	0.00	0.0	1.25	15354	1.72	32000	15,114	2.85	3.56	2.10	0.0	5.7	3.3	1.52	4.15	3.30	6.75	5.82	9.22	3.0
Mar-06	15,618	642	2.256%	70%	10.14	1.80	3.8	3.1	250	0	0.000%	70%	0.00	0.00	0.0	0	46	2.94%	70%	0.94	0.17	#DIV/0!	0	0	0.00%	70%	0.00	0.00	0.0	1.25	15868	1.73	32000	19,356	3.30	4.13	1.96	0.0	6.1	3.5	2.07	4.02	3.51	6.99	5.99	9.36	3.3
Apr-06	16,453	642	2.256%	175%	25.34	4.49	9.0	9.6	250	0	0.000%	175%	0.00	0.00	0.0	0	46	2.94%	175%	2.35	0.42	#DIV/0!	0	0	0.00%	175%	0.00	0.00	0.0	1.25	16703	1.76	32000	17,439	3.51	4.39	4.91	1.0	8.3	4.7	2.50	5.80	4.72	8.22	6.84	10.07	4.6
May-06	19,475	642	2.256%	170%	24.61	4.36	7.4	5.3	250	0	0.000%	170%	0.00	0.00	0.0	0	46	2.94%	170%	2.28	0.40	#DIV/0!	0	0	0.00%	170%	0.00	0.00	0.0	1.25	19725	1.85	32000	20,203	4.72	5.90	4.77	2.0	8.7	4.7	2.88	5.79	4.69	8.18	6.81	10.06	3.7
Jun-06	18,310	642	2.256%	150%	21.72	3.85	6.9	3.4	250	0	0.000%	150%	0.00	0.00	0.0	22	46	2.94%	150%	2.01	0.36	531.3	0	0	0.00%	150%	0.00	0.00	0.0	1.25	18582	1.82	32000	27,717	4.69	5.86	4.21	3.0	7.1	3.9	3.28	3.78	3.89	7.39	6.27	9.60	1.4
Jul-06	17,677	642	2.256%	40%	5.79	1.03	1.9	4.4	250	0	0.000%	40%	0.00	0.00	0.0	40	46	2.94%	40%	0.54	0.10	77.3	0	0	0.00%	40%	0.00	0.00	0.0	1.25	17967	1.80	32000	22,154	3.89	4.86	1.12	3.0	3.0	1.7	1.12	1.87	1.66	4.63	4.27	7.78	0.2
Aug-06	18,560	642	2.256%	60%	8.69	1.54	2.7	7.3	250	0	0.000%	60%	0.00	0.00	0.0	38	46	2.94%	60%	0.81	0.14	122.6	0	0	0.00%	60%	0.00	0.00	0.0	1.25	18849	1.82	32000	18,801	1.66	2.08	1.68	3.0	0.8	0.4	0.24	0.52	0.42	2.16	2.29	5.52	0.5
Sep-06	19,176	642	2.256%	150%	21.72	3.85	6.6	5.4	250	0	0.000%	150%	0.00	0.00	0.0	154	46	2.94%	150%	2.01	0.36	76.1	0	0	0.00%	150%	0.00	0.00	0.0	1.25	19580	1.85	32000	25,748	0.42	0.52	4.21	3.0	1.7	0.9	0.73	0.99	0.94	3.37	3.30	6.75	1.0
Oct-06	18,487	642	2.256%	75%	10.86	1.92	3.4	3.7	250	0	0.000%	75%	0.00	0.00	0.0	430	46	2.94%	75%	1.01	0.18	13.6	0	0	0.00%	75%	0.00	0.00	0.0	1.25	19166	1.83	32000	26,010	0.94	1.17	2.10	2.0	1.3	0.7	0.55	0.72	0.69	2.86	2.88	6.27	1.1
Nov-06	19,635	642	2.256%	75%	10.86	1.92	3.2	2.4	250	0	0.000%	75%	0.00	0.00	0.0	687	46	2.94%	75%	1.01	0.18	8.5	0	0	0.00%	75%	0.00	0.00	0.0	1.25	20572	1.88	32000	23,981	0.69	0.87	2.10	0.0	3.0	1.6	1.16	1.82	1.58	4.51	4.18	7.69	1.5
Dec-06	17,652	642	2.256%	100%	14.48	2.57	4.8	4.5	250	0	0.000%	100%	0.00	0.00	0.0	929	46	2.94%	100%	1.34	0.24	8.4	0	0	0.00%	100%	0.00	0.00	0.0	1.25	18831	1.82	32000	19,976	1.58	1.98	2.80	0.0	4.8	2.6	1.59	3.19	2.62	5.95	5.25	8.71	2.1
Jan-07	17,200	408	0.924%	91%	3.44	0.61	1.2		7,700	400	0.924%	91%	3.37	0.60	2.5	8,200	33	2.94%	91%	0.87	0.15	0.6	0	0	1.535%	91%	0.00	0.00	0.0	3.25	33100	4.26	32000	33,100	2.62	8.53	1.36	0.0	9.9	2.3	2.34	7.55	2.32	5.56	4.97	8.45	
Feb-07	17,200	408	0.924%	94%	3.56	0.63	1.2		7,700	400	0.924%	94%	3.49	0.62	2.6	8,200	33	2.94%	94%	0.90	0.16	0.6	0	0	1.535%	94%	0.00	0.00	0.0	3.25	33100	4.26	32000	33,100	2.32	7.55	1.41	0.0	9.0	2.1	2.12	6.84	2.10	5.27	4.75	8.25	
Mar-07	17,200	408	0.924%	93%	3.52	0.62	1.2		7,700	400	0.924%	93%	3.45	0.61	2.6	8,200	33	2.94%	93%	0.89	0.16	0.6	0	0	1.535%	93%	0.00	0.00	0.0	3.25	33100	4.26	32000	33,100	2.10	6.84	1.39	0.0	8.2	1.9	1.95	6.29	1.93	5.03	4.58	8.08	
Apr-07	17,200	408	0.924%	117%	4.40	0.78	1.5		7,700	400	0.924%	117%	4.31	0.76	3.3	8,200	33	2.94%	117%	1.11	0.20	0.8	0	0	1.535%	117%	0.00	0.00	0.0	3.25	33100	4.26	32000	33,100	1.93	6.29	1.74	1.0	7.0	1.7	1.66	5.37	1.65	4.61	4.26	7.77	
May-07	17,200	408	0.924%	116%	4.36	0.77	1.5		7,700	400	0.924%	116%	4.27	0.76	3.2	8,200	33	2.94%	116%	1.10	0.20	0.8	0	0	1.535%	116%	0.00	0.00	0.0	3.25	33100	4.26	45000	33,100	1.65	5.37	1.73	2.0	5.1	1.2	1.20	3.89	1.20	3.86	3.69	7.17	
Jun-07	17,200	408	0.924%	111%	4.19	0.74	1.4		7,700	400	0.924%	111%	4.11	0.73	3.1	8,200	33	2.94%	111%	1.06	0.19	0.8	0	0	1.535%	111%	0.00	0.00	0.0	3.25	33100	4.26	45000	33,100	1.20	3.89	1.66	3.0	2.5	0.6	0.60	1.94	0.60	2.64	2.70	6.04	

WLWB Ammonia Model - Lowest Practical Case with High Flow to A418 Surface Mine

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Jul-07	17,200	408	0.924%	87%	3.27	0.58	1.1		7,700	400	0.924%	87%	3.20	0.57	2.4	8,200	33	2.94%	87%	0.83	0.15	0.6	0	0	1.535%	87%	0.00	0.00	0.0	3.25	33100	4.26	45000	33,100	0.60	1.94	1.29	3.0	0.2	0.1	0.06	0.18	0.06	0.72	0.93	3.36	
Aug-07	17,200	408	0.924%	91%	3.44	0.61	1.2		7,700	400	0.924%	91%	3.37	0.60	2.5	8,200	33	2.94%	91%	0.87	0.15	0.6	0	0	1.535%	91%	0.00	0.00	0.0	3.25	33100	4.26	45000	33,100	0.06	0.18	1.36	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-07	17,200	408	0.924%	111%	4.19	0.74	1.4		7,700	400	0.924%	111%	4.11	0.73	3.1	8,200	33	2.94%	111%	1.06	0.19	0.8	0	0	1.535%	111%	0.00	0.00	0.0	3.25	33100	4.26	45000	33,100	0.00	0.00	1.66	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-07	17,200	408	0.924%	94%	3.56	0.63	1.2		7,700	400	0.924%	94%	3.49	0.62	2.6	8,200	33	2.94%	94%	0.90	0.16	0.6	0	0	1.535%	94%	0.00	0.00	0.0	3.25	33100	4.26	45000	33,100	0.00	0.00	1.41	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-07	17,200	408	0.924%	94%	3.56	0.63	1.2		7,700	400	0.924%	94%	3.49	0.62	2.6	8,200	33	2.94%	94%	0.90	0.16	0.6	0	0	1.535%	94%	0.00	0.00	0.0	3.25	33100	4.26	45000	33,100	0.00	0.00	1.41	0.0	1.4	0.3	0.33	1.08	0.33	1.91	2.07	5.22	
Dec-07	17,200	408	0.924%	100%	3.77	0.67	1.3		7,700	400	0.924%	100%	3.70	0.65	2.8	8,200	33	2.94%	100%	0.96	0.17	0.7	0	0	1.535%	100%	0.00	0.00	0.0	3.25	33100	4.26	45000	33,100	0.33	1.08	1.49	0.0	2.6	0.6	0.61	1.96	0.60	2.65	2.71	6.06	
Jan-08	8,950	90	0.924%	91%	0.76	0.13	0.5		10,500	808	0.924%	91%	6.81	1.21	3.8	24,600	28	2.94%	91%	0.76	0.13	0.2	0	0	1.535%	91%	0.00	0.00	0.0	3.25	44050	4.59	45000	44,050	0.60	1.96	1.47	0.0	3.4	0.7	1.00	2.43	0.75	2.98	2.98	6.39	
Feb-08	8,950	90	0.924%	94%	0.79	0.14	0.5		10,500	808	0.924%	94%	7.05	1.25	3.9	24,600	28	2.94%	94%	0.79	0.14	0.2	0	0	1.535%	94%	0.00	0.00	0.0	3.25	44050	4.59	45000	44,050	0.75	2.43	1.53	0.0	4.0	0.9	1.16	2.81	0.86	3.23	3.18	6.62	
Mar-08	8,950	90	0.924%	93%	0.78	0.14	0.5		10,500	808	0.924%	93%	6.97	1.24	3.9	24,600	28	2.94%	93%	0.78	0.14	0.2	0	0	1.535%	93%	0.00	0.00	0.0	3.25	44050	4.59	45000	44,050	0.86	2.81	1.51	0.0	4.3	0.9	1.26	3.06	0.94	3.38	3.31	6.76	
Apr-08	8,950	90	0.924%	117%	0.97	0.17	0.6		10,500	808	0.924%	117%	8.71	1.54	4.8	24,600	28	2.94%	117%	0.97	0.17	0.2	0	0	1.535%	117%	0.00	0.00	0.0	3.25	44050	4.59	45000	44,050	0.94	3.06	1.89	1.0	3.9	0.9	1.15	2.79	0.86	3.22	3.18	6.61	
May-08	8,950	90	0.924%	116%	0.96	0.17	0.6		10,500	808	0.924%	116%	8.63	1.53	4.8	24,600	28	2.94%	116%	0.96	0.17	0.2	0	0	1.535%	116%	0.00	0.00	0.0	3.25	44050	4.59	45000	44,050	0.86	2.79	1.87	2.0	2.7	0.6	0.78	1.89	0.58	2.59	2.66	6.00	
Jun-08	8,950	90	0.924%	111%	0.92	0.16	0.6		10,500	808	0.924%	111%	8.30	1.47	4.6	24,600	28	2.94%	111%	0.93	0.16	0.2	0	0	1.535%	111%	0.00	0.00	0.0	3.25	44050	4.59	45000	44,050	0.58	1.89	1.80	3.0	0.7	0.1	0.20	0.48	0.15	1.23	1.44	4.28	
Jul-08	8,950	90	0.924%	87%	0.72	0.13	0.5		10,500	808	0.924%	87%	6.47	1.15	3.6	24,600	28	2.94%	87%	0.72	0.13	0.2	0	0	1.535%	87%	0.00	0.00	0.0	3.25	44050	4.59	45000	44,050	0.15	0.48	1.40	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-08	8,950	90	0.924%	91%	0.76	0.13	0.5		10,500	808	0.924%	91%	6.81	1.21	3.8	24,600	28	2.94%	91%	0.76	0.13	0.2	0	0	1.535%	91%	0.00	0.00	0.0	3.25	44050	4.59	45000	44,050	0.00	0.00	1.47	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-08	8,950	90	0.924%	111%	0.92	0.16	0.6		10,500	808	0.924%	111%	8.30	1.47	4.6	24,600	28	2.94%	111%	0.93	0.16	0.2	0	0	1.535%	111%	0.00	0.00	0.0	3.25	44050	4.59	45000	44,050	0.00	0.00	1.80	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-08	8,950	90	0.924%	94%	0.79	0.14	0.5		10,500	808	0.924%	94%	7.05	1.25	3.9	24,600	28	2.94%	94%	0.79	0.14	0.2	0	0	1.535%	94%	0.00	0.00	0.0	3.25	44050	4.59	45000	44,050	0.00	0.00	1.53	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-08	8,950	90	0.924%	94%	0.79	0.14	0.5		10,500	808	0.924%	94%	7.05	1.25	3.9	24,600	28	2.94%	94%	0.79	0.14	0.2	0	0	1.535%	94%	0.00	0.00	0.0	3.25	44050	4.59	45000	44,050	0.00	0.00	1.53	0.0	1.5	0.3	0.45	1.08	0.33	1.91	2.07	5.23	
Dec-08	8,950	90	0.924%	100%	0.83	0.15	0.5		10,500	808	0.924%	100%	7.47	1.32	4.1	24,600	28	2.94%	100%	0.83	0.15	0.2	0	0	1.535%	100%	0.00	0.00	0.0	3.25	44050	4.59	45000	44,050	0.33	1.08	1.62	0.0	2.7	0.6	0.79	1.91	0.59	2.61	2.68	6.02	
Jan-09	700	0	0.924%	91%	0.00	0.00	0.0		14,100	600	0.924%	91%	5.05	0.90	2.1	40,900	18	2.94%	91%	0.47	0.08	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	55700	4.94	60000	55,700	0.59	1.91	0.99	0.0	2.9	0.6	0.99	1.90	0.58	2.61	2.67	6.01	
Feb-09	700	0	0.924%	94%	0.00	0.00	0.0		14,100	600	0.924%	94%	5.24	0.93	2.2	40,900	18	2.94%	94%	0.49	0.09	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	55700	4.94	60000	55,700	0.58	1.90	1.01	0.0	2.9	0.6	1.00	1.92	0.59	2.62	2.68	6.02	
Mar-09	700	0	0.924%	93%	0.00	0.00	0.0		14,100	600	0.924%	93%	5.17	0.92	2.1	40,900	18	2.94%	93%	0.48	0.09	0.1	0	0	1.535%	93%	0.00	0.00	0.0	3.25	55700	4.94	60000	55,700	0.59	1.92	1.00	0.0	2.9	0.6	1.00	1.92	0.59	2.62	2.68	6.02	
Apr-09	700	0	0.924%	117%	0.00	0.00	0.0		14,100	600	0.924%	117%	6.47	1.15	2.7	40,900	18	2.94%	117%	0.60	0.11	0.1	0	0	1.535%	117%	0.00	0.00	0.0	3.25	55700	4.94	60000	55,700	0.59	1.92	1.25	1.0	2.2	0.4	0.74	1.43	0.44	2.23	2.35	5.60	
May-09	700	0	0.924%	116%	0.00	0.00	0.0		14,100	600	0.924%	116%	6.41	1.14	2.6	40,900	18	2.94%	116%	0.59	0.11	0.1	0	0	1.535%	116%	0.00	0.00	0.0	3.25	55700	4.94	60000	55,700	0.44	1.43	1.24	2.0	0.7	0.1	0.23	0.44	0.13	1.16	1.38	4.18	
Jun-09	700	0	0.924%	111%	0.00	0.00	0.0		14,100	600	0.924%	111%	6.16	1.09	2.5	40,900	18	2.94%	111%	0.57	0.10	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	55700	4.94	60000	55,700	0.13	0.44	1.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-09	700	0	0.924%	87%	0.00	0.00	0.0		14,100	600	0.924%	87%	4.80	0.85	2.0	40,900	18	2.94%	87%	0.45	0.08	0.1	0	0	1.535%	87%	0.00	0.00	0.0	3.25	55700	4.94	60000	55,700	0.00	0.00	0.93	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-09	700	0	0.924%	91%	0.00	0.00	0.0		14,100	600	0.924%	91%	5.05	0.90	2.1	40,900	18	2.94%	91%	0.47	0.08	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	55700	4.94	60000	55,700	0.00	0.00	0.98	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-09	700	0	0.924%	111%	0.00	0.00	0.0		14,100	600	0.924%	111%	6.16	1.09	2.5	40,900	18	2.94%	111%	0.57	0.10	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	55700	4.94	60000	55,700	0.00	0.00	1.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-09	700	0	0.924%	94%	0.00	0.00	0.0		14,100	600	0.924%	94%	5.24	0.93	2.2	40,900	18	2.94%	94%	0.49	0.09	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	55700	4.94	60000	55,700	0.00	0.00	1.01	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-09	700	0	0.924%	94%	0.00	0.00	0.0		14,100	600	0.924%	94%	5.24	0.93	2.2	40,900	18	2.94%	94%	0.49	0.09	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	55700	4.94	60000	55,700	0.00	0.00	1.01	0.0	1.0	0.2	0.35	0.67	0.21	1.46	1.67	4.64	
Dec-09	700	0	0.924%	100%	0.00	0.00	0.0		14,100	600	0.924%	100%	5.54	0.98	2.3	40,900	18	2.94%	100%	0.51	0.09	0.1	0	0	1.535%	100%	0.00	0.00	0.0	3.25	55700	4.94	60000	55,700	0.21	0.67	1.07	0.0	1.7	0.4	0.60	1.14	0.35	1.97	2.13	5.30	
Jan-10	700	0	0.924%	91%	0.00	0.00	0.0		15,700	183	0.924%	91%	1.54	0.27	0.6	39,200	11	2.94%	91%	0.29	0.05	0.0	0	0	1.535%	91%	0.00	0.00	0.0	3.25	55600	4.94	60000	55,600	0.35	1.14	0.33	0.0	1.5	0.3	0.50	0.97	0.30	1.80	1.97	5.08	
Feb-10	700	0	0.924%	94%	0.00	0.00	0.0		15,700	183	0.924%	94%	1.60	0.28	0.6	39,200	11	2.94%	94%	0.30	0.05	0.0	0	0	1.535%	94%	0.00	0.00	0.0	3.25	55600	4.94	60000	55,600	0.30	0.97	0.34	0.0	1.3	0.3	0.45	0.86	0.26	1.68	1.87	4.93	
Mar-10	700	0	0.924%	93%	0.00	0.00	0.0		15,700	183	0.924%	93%	1.58	0.28	0.6	39,200	11	2.94%	93%	0.30	0.05	0.0	0	0	1.535%	93%	0.00	0.00	0.0	3.25	55600	4.94	60000	55,600	0.26	0.86	0.33	0.0	1.2	0.2	0.41	0.78	0.24	1.60	1.79	4.82	
Apr-10	700	0	0.924%	117%	0.00	0.00	0.0		15,700	183	0.924%	117%	1.98	0.35	0.7	39,200	11	2.94%	117%	0.37	0.07	0.1	0	0	1.535%	117%	0.00	0.00	0.0	3.25	55600	4.94	60000	55,600	0.24	0.78	0.42	1.0	0.2	0.0	0.07	0.13	0.04	0.60	0.80	3.10	
May-10	700	0	0.924%	116%	0.00	0.00	0.0		15,700	183	0.924%	116%	1.96	0.35	0.7	39,200	11	2.94%	116%	0.37	0.07	0.1	0	0	1.535%	116%	0.00	0.00	0.0	3.25	55600	4.94	60000	55,600	0.04	0.13	0.41	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-10	700	0	0.924%	111%	0.00	0.00	0.0		15,700	183	0.924%	111%	1.88	0.33	0.7	39,200	11	2.94%	111%	0.36	0.06	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	55600	4.94	60000	55,600	0.00	0.00	0.40	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-10	700	0	0.924%	87%	0.00	0.00	0.0		15,700	183	0.924%	87%	1.47	0.26	0.5	39,200	11	2.94%	87%	0.28	0.05	0.0	0	0	1.535%	87%	0.00	0.00	0.0	3.25	55600	4.94	60000	55,600	0.00	0.00	0.31	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-10	700	0	0.924%	91%	0.00	0.00	0.0		15,700	183	0.924%	91%	1.54	0.27	0.6	39,200	11	2.94%	91%	0.29	0.05	0.0	0	0	1.535%	91%	0.00	0.00	0.0	3.25	55600	4.94	60000	55,600	0.00	0.00	0.33	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-10	700	0	0.924%	111%	0.00	0.00	0.0		15,700	183	0.924%	111%	1.88	0.33	0.7	39,200	11	2.94%	111%	0.36	0.06	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	55600	4.94	60000	55,600	0.00	0.00	0.40	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-10	700	0	0.924%	94%	0.00	0.00	0.0		15,700	183	0.924%	94%	1.60	0.28	0.6	39,200	11	2.94%	94%	0.30	0.05	0.0	0	0	1.535%	94%	0.00	0.00	0.0	3.25	55600	4.94	60000	55,600	0.00	0.00	0.34	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-10	700	0	0.924%	94%	0.00	0.00	0.0		15,700	183	0.924%	94%	1.60	0.28	0.6	39,200	11	2.94%	94%	0.30	0.05	0.0	0	0	1.535%	94%	0.00	0.00	0.0	3.25	55600	4.94	60000	55,600	0.00	0.00	0.34	0.0	0.3	0.1	0.12	0.22	0.07	0.80	1.02	3.53	
Dec-10	700	0	0.924%	100%	0.00	0.00	0.0		15,700	183	0.924%	100%	1.69	0.30	0.6	39,200	11	2.94%	100%	0.32	0.06	0.0	0	0	1.535%	100%	0.00	0.00	0.0	3.25	55600	4.94	60000	55,600	0.07	0.22	0.36	0.0	0.6	0.1	0.20	0.38	0.12	1.08	1.30	4.04	
Jan-11	700	0	0.924%	91%	0.00	0.00	0.0		17,200	23	0.924%	91%	0.20	0.03	0.1	37,400	33	2.94%	91%	0.87	0.15	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	55300	4.93	60000	55,300	0.12	0.38	0.19	0.0	0.6	0.1	0.19	0.38	0.12	1.07	1.29	4.02	
Feb-11	700	0	0.924%	94%	0.00	0.00	0.0		17,200	23	0.924%	94%	0.20	0.04	0.1	37,400	33	2.94%	94%	0.90	0.16	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	55300	4.93	60000	55,300	0.12	0.38	0.20	0.0	0.6	0.1	0.19	0.38	0.12	1.07	1.29	4.02	
Mar-11	700	0	0.924%	93%	0.00	0.00	0.0		17,200	23	0.924%	93%	0.20	0.04	0.1	37,400	33	2.94%	93%	0.89	0.16	0.1	0	0	1.535%	93%	0.00	0.00	0.0	3.25	55300	4.93	60000	55,300	0.12	0.38	0.19	0.0	0.6	0.1	0.19	0.38	0.12	1.07	1.29	4.02	
Apr-11	700	0	0.924%	117%	0.00	0.00	0.0		17,200	23	0.924%	117%	0.25	0.04	0.1	37,400	33	2.94%	117%	1.11	0.20	0.2	0	0	1.535%	117%	0.00	0.00	0.0	3.25	55300	4.93	60000	55,300	0.12	0.38	0.24	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-11	700	0	0.924%	116%	0.00	0.00	0.0		17,200	23	0.924%	116%	0.25	0.04	0.1	37,400	33	2.94%	116%	1.10	0.20	0.2	0	0	1.535%	116%	0.00	0.00	0.0	3.25	55300	4.93	60000	55,300	0.00	0.00	0.24	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-11	700	0	0.924%	111%	0.00	0.00	0.0		17,200	23	0.924%	111%	0.24	0.04	0.1	37,400	33	2.94%	111%	1.06	0.19	0.2	0	0	1.535%	111%	0.00	0.00	0.0	3.25	55300	4.93	60000	55,300	0.00	0.00	0.23	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-11	700	0	0.924%	87%	0.00	0.00	0.0		17,200	23	0.924%	87%	0.19	0.03	0.1	37,400	33	2.94%	87%	0.83	0.15	0.1	0	0	1.535%	87%	0.00	0.00	0.0	3.25	55300	4.93	60000	55,300	0.00	0.00	0.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-11	700	0	0.924%	91%	0.00	0.00	0.0		17,200	23	0.924%	91%	0.20	0.03	0.1	37,400	33	2.94%	91%	0.87	0.15	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	55300	4.93	60000	55,300	0.00	0.00	0.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-11	700	0	0.924%	111%	0.00	0.00	0.0		17,200	23	0.924%	111%	0.24	0.04	0.1	37,400	33	2.94%	111%	1.06	0.19	0.2	0	0	1.535%	111%	0.00	0.00	0.0	3.25	55300	4.93	60000	55,300	0.00	0.00	0.23	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-11	700	0	0.924%	94%	0.00	0.00	0.0		17,200	23	0.924%	94%	0.20	0.04	0.1	37,400	33	2.94%	94%	0.90	0.16	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	55300	4.93	60000	55,300	0.00	0.00	0.20	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-11	700	0	0.924%	94%	0.00	0.00	0.0		17,200	23	0.924%	94%	0.20	0.04	0.1	37,400	33	2.94%	94%	0.90	0.16	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	55300	4.93	60000	55,300	0.00	0.00	0.20	0.0	0.2	0.0	0.07	0.13	0.04	0.59	0.80	3.09	
Dec-11	700	0	0.924%	100%	0.00	0.00	0.0		17,200	23	0.924%	100%	0.22	0.04	0.1	37,400	33	2.94%	100%	0.96	0.17	0.1	0	0	1.535%	100%	0.00	0.00	0.0	3.25	55300	4.93	60000	55,300	0.04	0.13	0.21	0.0	0.3	0.1	0.11	0.22	0.07	0.80	1.02	3.53	

WLWB Ammonia Model - Lowest Practical Case with High Flow to A418 Surface Mine

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N Input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L	Actual NH4-N concentration (mg/L)
Jan-12	700	0	0.924%	91%	0.00	0.00	0.0		8,950	1	0.924%	91%	0.01	0.00	0.0	54,350	30	2.94%	91%	0.80	0.14	0.1	2,100	190	1.535%	91%	2.92	0.52	8.1	3.25	66100	5.26	60000	66,100	0.07	0.22	0.66	0.0	0.9	0.2	0.34	0.55	0.17	1.31	1.52	4.41	
Feb-12	700	0	0.924%	94%	0.00	0.00	0.0		8,950	1	0.924%	94%	0.01	0.00	0.0	54,350	30	2.94%	94%	0.83	0.15	0.1	2,100	190	1.535%	94%	2.92	0.52	8.1	3.25	66100	5.26	60000	66,100	0.17	0.55	0.67	0.0	1.2	0.2	0.46	0.75	0.23	1.56	1.76	4.77	
Mar-12	700	0	0.924%	93%	0.00	0.00	0.0		8,950	1	0.924%	93%	0.01	0.00	0.0	54,350	30	2.94%	93%	0.82	0.15	0.1	2,100	190	1.535%	93%	2.92	0.52	8.1	3.25	66100	5.26	60000	66,100	0.23	0.75	0.66	0.0	1.4	0.3	0.54	0.87	0.27	1.70	1.88	4.96	
Apr-12	700	0	0.924%	117%	0.00	0.00	0.0		8,950	1	0.924%	117%	0.01	0.00	0.0	54,350	30	2.94%	117%	1.03	0.18	0.1	2,100	190	1.535%	117%	2.92	0.52	8.1	3.25	66100	5.26	60000	66,100	0.27	0.87	0.70	1.0	0.6	0.1	0.22	0.35	0.11	1.04	1.25	3.97	
May-12	700	0	0.924%	116%	0.00	0.00	0.0		8,950	1	0.924%	116%	0.01	0.00	0.0	54,350	30	2.94%	116%	1.02	0.18	0.1	2,100	190	1.535%	116%	2.92	0.52	8.1	3.25	66100	5.26	60000	66,100	0.11	0.35	0.70	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-12	700	0	0.924%	111%	0.00	0.00	0.0		8,950	1	0.924%	111%	0.01	0.00	0.0	54,350	30	2.94%	111%	0.98	0.17	0.1	2,100	190	1.535%	111%	2.92	0.52	8.1	3.25	66100	5.26	60000	66,100	0.00	0.00	0.69	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-12	700	0	0.924%	87%	0.00	0.00	0.0		8,950	1	0.924%	87%	0.01	0.00	0.0	54,350	30	2.94%	87%	0.76	0.14	0.1	2,100	190	1.535%	87%	2.92	0.52	8.1	3.25	66100	5.26	60000	66,100	0.00	0.00	0.65	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-12	700	0	0.924%	91%	0.00	0.00	0.0		8,950	1	0.924%	91%	0.01	0.00	0.0	54,350	30	2.94%	91%	0.80	0.14	0.1	2,100	190	1.535%	91%	2.92	0.52	8.1	3.25	66100	5.26	60000	66,100	0.00	0.00	0.66	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-12	700	0	0.924%	111%	0.00	0.00	0.0		8,950	1	0.924%	111%	0.01	0.00	0.0	54,350	30	2.94%	111%	0.98	0.17	0.1	2,100	190	1.535%	111%	2.92	0.52	8.1	3.25	66100	5.26	60000	66,100	0.00	0.00	0.69	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-12	700	0	0.924%	94%	0.00	0.00	0.0		8,950	1	0.924%	94%	0.01	0.00	0.0	54,350	30	2.94%	94%	0.83	0.15	0.1	2,100	190	1.535%	94%	2.92	0.52	8.1	3.25	66100	5.26	60000	66,100	0.00	0.00	0.67	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-12	700	0	0.924%	94%	0.00	0.00	0.0		8,950	1	0.924%	94%	0.01	0.00	0.0	54,350	30	2.94%	94%	0.83	0.15	0.1	2,100	190	1.535%	94%	2.92	0.52	8.1	3.25	66100	5.26	60000	66,100	0.00	0.00	0.67	0.0	0.7	0.1	0.25	0.41	0.13	1.12	1.34	4.11	
Dec-12	700	0	0.924%	100%	0.00	0.00	0.0		8,950	1	0.924%	100%	0.01	0.00	0.0	54,350	30	2.94%	100%	0.88	0.16	0.1	2,100	190	1.535%	100%	2.92	0.52	8.1	3.25	66100	5.26	60000	66,100	0.13	0.41	0.67	0.0	1.1	0.2	0.42	0.67	0.21	1.47	1.67	4.64	
Jan-13	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	54,300	17	2.94%	91%	0.45	0.08	0.0	4,500	376	1.535%	91%	5.77	1.02	7.5	3.25	60200	5.08	60000	60,200	0.21	0.67	1.10	0.0	1.8	0.3	0.64	1.13	0.35	1.96	2.12	5.29	
Feb-13	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	54,300	17	2.94%	94%	0.46	0.08	0.0	4,500	376	1.535%	94%	5.77	1.02	7.5	3.25	60200	5.08	60000	60,200	0.35	1.13	1.10	0.0	2.2	0.4	0.81	1.43	0.44	2.23	2.35	5.60	
Mar-13	700	0	0.924%	93%	0.00	0.00	0.0		700	0	0.924%	93%	0.00	0.00	0.0	54,300	17	2.94%	93%	0.46	0.08	0.0	4,500	376	1.535%	93%	5.77	1.02	7.5	3.25	60200	5.08	60000	60,200	0.44	1.43	1.10	0.0	2.5	0.5	0.91	1.62	0.50	2.39	2.49	5.78	
Apr-13	700	0	0.924%	117%	0.00	0.00	0.0		700	0	0.924%	117%	0.00	0.00	0.0	54,300	17	2.94%	117%	0.57	0.10	0.1	4,500	376	1.535%	117%	5.77	1.02	7.5	3.25	60200	5.08	60000	60,200	0.50	1.62	1.12	1.0	1.7	0.3	0.63	1.12	0.34	1.94	2.10	5.27	
May-13	700	0	0.924%	116%	0.00	0.00	0.0		700	0	0.924%	116%	0.00	0.00	0.0	54,300	17	2.94%	116%	0.57	0.10	0.1	4,500	376	1.535%	116%	5.77	1.02	7.5	3.25	60200	5.08	60000	60,200	0.34	1.12	1.12	2.0	0.2	0.0	0.09	0.15	0.05	0.65	0.86	3.22	
Jun-13	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	54,300	17	2.94%	111%	0.54	0.10	0.1	4,500	376	1.535%	111%	5.77	1.02	7.5	3.25	60200	5.08	60000	60,200	0.05	0.15	1.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-13	700	0	0.924%	87%	0.00	0.00	0.0		700	0	0.924%	87%	0.00	0.00	0.0	54,300	17	2.94%	87%	0.42	0.08	0.0	4,500	376	1.535%	87%	5.77	1.02	7.5	3.25	60200	5.08	60000	60,200	0.00	0.00	1.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-13	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	54,300	17	2.94%	91%	0.45	0.08	0.0	4,500	376	1.535%	91%	5.77	1.02	7.5	3.25	60200	5.08	60000	60,200	0.00	0.00	1.10	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-13	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	54,300	17	2.94%	111%	0.54	0.10	0.1	4,500	376	1.535%	111%	5.77	1.02	7.5	3.25	60200	5.08	60000	60,200	0.00	0.00	1.12	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-13	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	54,300	17	2.94%	94%	0.46	0.08	0.0	4,500	376	1.535%	94%	5.77	1.02	7.5	3.25	60200	5.08	60000	60,200	0.00	0.00	1.10	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-13	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	54,300	17	2.94%	94%	0.46	0.08	0.0	4,500	376	1.535%	94%	5.77	1.02	7.5	3.25	60200	5.08	60000	60,200	0.00	0.00	1.10	0.0	1.1	0.2	0.40	0.71	0.22	1.51	1.71	4.70	
Dec-13	700	0	0.924%	100%	0.00	0.00	0.0		700	0	0.924%	100%	0.00	0.00	0.0	54,300	17	2.94%	100%	0.49	0.09	0.1	4,500	376	1.535%	100%	5.77	1.02	7.5	3.25	60200	5.08	60000	60,200	0.22	0.71	1.11	0.0	1.8	0.4	0.65	1.16	0.36	1.99	2.14	5.32	
Jan-14	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	55,950	21	2.94%	91%	0.56	0.10	0.1	7,200	468	1.535%	91%	7.17	1.27	5.8	3.25	64550	5.21	60000	64,550	0.36	1.16	1.37	0.0	2.5	0.5	0.95	1.58	0.49	2.35	2.46	5.74	
Feb-14	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	55,950	21	2.94%	94%	0.58	0.10	0.1	7,200	468	1.535%	94%	7.17	1.27	5.8	3.25	64550	5.21	60000	64,550	0.49	1.58	1.37	0.0	3.0	0.6	1.11	1.84	0.57	2.56	2.63	5.96	
Mar-14	700	0	0.924%	93%	0.00	0.00	0.0		700	0	0.924%	93%	0.00	0.00	0.0	55,950	21	2.94%	93%	0.57	0.10	0.1	7,200	468	1.535%	93%	7.17	1.27	5.8	3.25	64550	5.21	60000	64,550	0.57	1.84	1.37	0.0	3.2	0.6	1.21	2.00	0.62	2.68	2.73	6.09	
Apr-14	700	0	0.924%	117%	0.00	0.00	0.0		700	0	0.924%	117%	0.00	0.00	0.0	55,950	21	2.94%	117%	0.71	0.13	0.1	7,200	468	1.535%	117%	7.17	1.27	5.8	3.25	64550	5.21	60000	64,550	0.62	2.00	1.40	1.0	2.4	0.5	0.90	1.50	0.46	2.28	2.40	5.66	
May-14	700	0	0.924%	116%	0.00	0.00	0.0		700	0	0.924%	116%	0.00	0.00	0.0	55,950	21	2.94%	116%	0.71	0.13	0.1	7,200	468	1.535%	116%	7.17	1.27	5.8	3.25	64550	5.21	60000	64,550	0.46	1.50	1.40	2.0	0.9	0.2	0.34	0.56	0.17	1.33	1.54	4.43	
Jun-14	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	55,950	21	2.94%	111%	0.68	0.12	0.1	7,200	468	1.535%	111%	7.17	1.27	5.8	3.25	64550	5.21	60000	64,550	0.17	0.56	1.39	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-14	700	0	0.924%	87%	0.00	0.00	0.0		700	0	0.924%	87%	0.00	0.00	0.0	55,950	21	2.94%	87%	0.53	0.09	0.1	7,200	468	1.535%	87%	7.17	1.27	5.8	3.25	64550	5.21	60000	64,550	0.00	0.00	1.37	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-14	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	55,950	21	2.94%	91%	0.56	0.10	0.1	7,200	468	1.535%	91%	7.17	1.27	5.8	3.25	64550	5.21	60000	64,550	0.00	0.00	1.37	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-14	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	55,950	21	2.94%	111%	0.68	0.12	0.1	7,200	468	1.535%	111%	7.17	1.27	5.8	3.25	64550	5.21	60000	64,550	0.00	0.00	1.39	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-14	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	55,950	21	2.94%	94%	0.58	0.10	0.1	7,200	468	1.535%	94%	7.17	1.27	5.8	3.25	64550	5.21	60000	64,550	0.00	0.00	1.37	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-14	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	55,950	21	2.94%	94%	0.58	0.10	0.1	7,200	468	1.535%	94%	7.17	1.27	5.8	3.25	64550	5.21	60000	64,550	0.00	0.00	1.37	0.0	1.4	0.3	0.52	0.86	0.26	1.68	1.87	4.93	
Dec-14	700	0	0.924%	100%	0.00	0.00	0.0		700	0	0.924%	100%	0.00	0.00	0.0	55,950	21	2.94%	100%	0.61	0.11	0.1	7,200	468	1.535%	100%	7.17	1.27	5.8	3.25	64550	5.21	60000	64,550	0.26	0.86	1.38	0.0	2.2	0.4	0.84	1.39	0.43	2.20	2.32	5.56	
Jan-15	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	57,600	28	2.94%	91%	0.76	0.13	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	59000	5.04	60000	59,000	0.43	1.39	0.13	0.0	1.5	0.3	0.54	0.98	0.30	1.81	1.99	5.11	
Feb-15	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	57,600	28	2.94%	94%	0.79	0.14	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	59000	5.04	60000	59,000	0.30	0.98	0.14	0.0	1.1	0.2	0.40	0.72	0.22	1.53	1.73	4.73	
Mar-15	700	0	0.924%	93%	0.00	0.00	0.0		700	0	0.924%	93%	0.00	0.00	0.0	57,600	28	2.94%	93%	0.78	0.14	0.1	0	0	1.535%	93%	0.00	0.00	0.0	3.25	59000	5.04	60000	59,000	0.22	0.72	0.14	0.0	0.9	0.2	0.31	0.56	0.17	1.32	1.54	4.43	
Apr-15	700	0	0.924%	117%	0.00	0.00	0.0		700	0	0.924%	117%	0.00	0.00	0.0	57,600	28	2.94%	117%	0.97	0.17	0.1	0	0	1.535%	117%	0.00	0.00	0.0	3.25	59000	5.04	60000	59,000	0.17	0.56	0.17	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-15	700	0	0.924%	116%	0.00	0.00	0.0		700	0	0.924%	116%	0.00	0.00	0.0	57,600	28	2.94%	116%	0.96	0.17	0.1	0	0	1.535%	116%	0.00	0.00	0.0	3.25	59000	5.04	60000	59,000	0.00	0.00	0.17	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-15	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	57,600	28	2.94%	111%	0.93	0.16	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	59000	5.04	60000	59,000	0.00	0.00	0.16	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-15	700	0	0.924%	87%	0.00	0.00	0.0		700	0	0.924%	87%	0.00	0.00	0.0	57,600	28	2.94%	87%	0.72	0.13	0.1	0	0	1.535%	87%	0.00	0.00	0.0	3.25	59000	5.04	60000	59,000	0.00	0.00	0.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-15	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	57,600	28	2.94%	91%	0.76	0.13	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	59000	5.04	60000	59,000	0.00	0.00	0.13	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-15	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	57,600	28	2.94%	111%	0.93	0.16	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	59000	5.04	60000	59,000	0.00	0.00	0.16	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-15	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	57,600	28	2.94%	94%	0.79	0.14	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	59000	5.04	60000	59,000	0.00	0.00	0.14	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-15	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	57,600	28	2.94%	94%	0.79	0.14	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	59000	5.04	60000	59,000	0.00	0.00	0.14	0.0	0.1	0.0	0.05	0.09	0.03	0.49	0.68	2.82	
Dec-15	700	0	0.924%	100%	0.00	0.00	0.0		700	0	0.924%	100%	0.00	0.00	0.0	57,600	28	2.94%	100%	0.83	0.15	0.1	0	0	1.535%	100%	0.00	0.00	0.0	3.25	59000	5.04	60000	59,000	0.03	0.09	0.15	0.0	0.2	0.0	0.08	0.15	0.05	0.65	0.86	3.22	
Jan-16	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	57,000	31	2.94%	91%	0.83	0.15	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	58400	5.03	60000	58,400	0.05	0.15	0.15	0.0	0.3	0.1	0.11	0.19	0.06	0.74	0.96	3.41	
Feb-16	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	57,000	31	2.94%	94%	0.86	0.15	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	58400	5.03	60000	58,400	0.06	0.19	0.15	0.0	0.3	0.1	0.12	0.22	0.07	0.80	1.02	3.54	
Mar-16	700	0	0.924%	93%	0.00	0.00	0.0		700	0	0.924%	93%	0.00	0.00	0.0	57,000	31	2.94%	93%	0.85	0.15	0.1	0	0	1.535%	93%	0.00	0.00	0.0	3.25	58400	5.03	60000	58,400	0.07	0.22	0.15	0.0	0.4	0.1	0.13	0.24	0.07	0.84	1.06	3.60	
Apr-16	700	0	0.924%	117%	0.00	0.00	0.0		700	0	0.924%	117%	0.00	0.00	0.0	57,000	31	2.94%	117%	1.06	0.19	0.1	0	0	1.535%	117%	0.00	0.00	0.0	3.25	58400	5.03	60000	58,400	0.07	0.24	0.19	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-16	700	0	0.924%	116%	0.00	0.00	0.0		700	0	0.924%	116%	0.00	0.00	0.0	57,000	31	2.94%	116%	1.05	0.19	0.1	0	0	1.535%	116%	0.00	0.00	0.0	3.25	58400	5.03	60000	58,400	0.00	0.00	0.19	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-16	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	57,000	31	2.94%	111%	1.01	0.18	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	58400	5.03	60000	58,400	0.00	0.00	0.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Lowest Practical Case with High Flow to A418 Surface Mine

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L)	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L)	Actual NH4-N concentration (mg/L)
Jul-16	700	0	0.924%	87%	0.00	0.00	0.0		700	0	0.924%	87%	0.00	0.00	0.0	57,000	31	2.94%	87%	0.79	0.14	0.1	0	0	1.535%	87%	0.00	0.00	0.0	3.25	58400	5.03	60000	58,400	0.00	0.00	0.14	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-16	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	57,000	31	2.94%	91%	0.83	0.15	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	58400	5.03	60000	58,400	0.00	0.00	0.15	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-16	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	57,000	31	2.94%	111%	1.01	0.18	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	58400	5.03	60000	58,400	0.00	0.00	0.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-16	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	57,000	31	2.94%	94%	0.86	0.15	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	58400	5.03	60000	58,400	0.00	0.00	0.15	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-16	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	57,000	31	2.94%	94%	0.86	0.15	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	58400	5.03	60000	58,400	0.00	0.00	0.15	0.0	0.2	0.0	0.05	0.10	0.03	0.51	0.70	2.88	
Dec-16	700	0	0.924%	100%	0.00	0.00	0.0		700	0	0.924%	100%	0.00	0.00	0.0	57,000	31	2.94%	100%	0.91	0.16	0.1	0	0	1.535%	100%	0.00	0.00	0.0	3.25	58400	5.03	60000	58,400	0.03	0.10	0.16	0.0	0.3	0.1	0.09	0.17	0.05	0.68	0.89	3.29	
Jan-17	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	56,500	38	2.94%	91%	1.00	0.18	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	57900	5.01	60000	57,900	0.05	0.17	0.18	0.0	0.3	0.1	0.12	0.22	0.07	0.80	1.02	3.54	
Feb-17	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	56,500	38	2.94%	94%	1.04	0.18	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	57900	5.01	60000	57,900	0.07	0.22	0.18	0.0	0.4	0.1	0.14	0.26	0.08	0.88	1.10	3.69	
Mar-17	700	0	0.924%	93%	0.00	0.00	0.0		700	0	0.924%	93%	0.00	0.00	0.0	56,500	38	2.94%	93%	1.03	0.18	0.1	0	0	1.535%	93%	0.00	0.00	0.0	3.25	57900	5.01	60000	57,900	0.08	0.26	0.18	0.0	0.4	0.1	0.16	0.29	0.09	0.93	1.15	3.77	
Apr-17	700	0	0.924%	117%	0.00	0.00	0.0		700	0	0.924%	117%	0.00	0.00	0.0	56,500	38	2.94%	117%	1.29	0.23	0.1	0	0	1.535%	117%	0.00	0.00	0.0	3.25	57900	5.01	60000	57,900	0.09	0.29	0.23	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-17	700	0	0.924%	116%	0.00	0.00	0.0		700	0	0.924%	116%	0.00	0.00	0.0	56,500	38	2.94%	116%	1.27	0.23	0.1	0	0	1.535%	116%	0.00	0.00	0.0	3.25	57900	5.01	60000	57,900	0.00	0.00	0.23	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-17	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	56,500	38	2.94%	111%	1.23	0.22	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	57900	5.01	60000	57,900	0.00	0.00	0.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-17	700	0	0.924%	87%	0.00	0.00	0.0		700	0	0.924%	87%	0.00	0.00	0.0	56,500	38	2.94%	87%	0.96	0.17	0.1	0	0	1.535%	87%	0.00	0.00	0.0	3.25	57900	5.01	60000	57,900	0.00	0.00	0.17	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-17	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	56,500	38	2.94%	91%	1.00	0.18	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	57900	5.01	60000	57,900	0.00	0.00	0.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-17	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	56,500	38	2.94%	111%	1.23	0.22	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	57900	5.01	60000	57,900	0.00	0.00	0.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-17	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	56,500	38	2.94%	94%	1.04	0.18	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	57900	5.01	60000	57,900	0.00	0.00	0.18	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-17	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	56,500	38	2.94%	94%	1.04	0.18	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	57900	5.01	60000	57,900	0.00	0.00	0.18	0.0	0.2	0.0	0.06	0.12	0.04	0.57	0.77	3.03	
Dec-17	700	0	0.924%	100%	0.00	0.00	0.0		700	0	0.924%	100%	0.00	0.00	0.0	56,500	38	2.94%	100%	1.10	0.20	0.1	0	0	1.535%	100%	0.00	0.00	0.0	3.25	57900	5.01	60000	57,900	0.04	0.12	0.20	0.0	0.3	0.1	0.11	0.20	0.06	0.76	0.98	3.46	
Jan-18	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	56,000	37	2.94%	91%	0.98	0.17	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	57400	5.00	60000	57,400	0.06	0.20	0.17	0.0	0.4	0.1	0.13	0.25	0.08	0.85	1.06	3.62	
Feb-18	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	56,000	37	2.94%	94%	1.02	0.18	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	57400	5.00	60000	57,400	0.08	0.25	0.18	0.0	0.4	0.1	0.15	0.28	0.09	0.90	1.12	3.73	
Mar-18	700	0	0.924%	93%	0.00	0.00	0.0		700	0	0.924%	93%	0.00	0.00	0.0	56,000	37	2.94%	93%	1.01	0.18	0.1	0	0	1.535%	93%	0.00	0.00	0.0	3.25	57400	5.00	60000	57,400	0.09	0.28	0.18	0.0	0.5	0.1	0.16	0.30	0.09	0.94	1.16	3.79	
Apr-18	700	0	0.924%	117%	0.00	0.00	0.0		700	0	0.924%	117%	0.00	0.00	0.0	56,000	37	2.94%	117%	1.26	0.22	0.1	0	0	1.535%	117%	0.00	0.00	0.0	3.25	57400	5.00	60000	57,400	0.09	0.30	0.22	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-18	700	0	0.924%	116%	0.00	0.00	0.0		700	0	0.924%	116%	0.00	0.00	0.0	56,000	37	2.94%	116%	1.25	0.22	0.1	0	0	1.535%	116%	0.00	0.00	0.0	3.25	57400	5.00	60000	57,400	0.00	0.00	0.22	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-18	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	56,000	37	2.94%	111%	1.20	0.21	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	57400	5.00	60000	57,400	0.00	0.00	0.21	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-18	700	0	0.924%	87%	0.00	0.00	0.0		700	0	0.924%	87%	0.00	0.00	0.0	56,000	37	2.94%	87%	0.93	0.17	0.1	0	0	1.535%	87%	0.00	0.00	0.0	3.25	57400	5.00	60000	57,400	0.00	0.00	0.17	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-18	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	56,000	37	2.94%	91%	0.98	0.17	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	57400	5.00	60000	57,400	0.00	0.00	0.17	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-18	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	56,000	37	2.94%	111%	1.20	0.21	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	57400	5.00	60000	57,400	0.00	0.00	0.21	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-18	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	56,000	37	2.94%	94%	1.02	0.18	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	57400	5.00	60000	57,400	0.00	0.00	0.18	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-18	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	56,000	37	2.94%	94%	1.02	0.18	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	57400	5.00	60000	57,400	0.00	0.00	0.18	0.0	0.2	0.0	0.06	0.12	0.04	0.56	0.76	3.02	
Dec-18	700	0	0.924%	100%	0.00	0.00	0.0		700	0	0.924%	100%	0.00	0.00	0.0	56,000	37	2.94%	100%	1.09	0.19	0.1	0	0	1.535%	100%	0.00	0.00	0.0	3.25	57400	5.00	60000	57,400	0.04	0.12	0.19	0.0	0.3	0.1	0.11	0.20	0.06	0.76	0.97	3.44	
Jan-19	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	55,500	33	2.94%	91%	0.87	0.15	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	56900	4.98	60000	56,900	0.06	0.20	0.15	0.0	0.4	0.1	0.12	0.23	0.07	0.82	1.04	3.57	
Feb-19	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	55,500	33	2.94%	94%	0.90	0.16	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	56900	4.98	60000	56,900	0.07	0.23	0.16	0.0	0.4	0.1	0.14	0.26	0.08	0.86	1.08	3.66	
Mar-19	700	0	0.924%	93%	0.00	0.00	0.0		700	0	0.924%	93%	0.00	0.00	0.0	55,500	33	2.94%	93%	0.89	0.16	0.1	0	0	1.535%	93%	0.00	0.00	0.0	3.25	56900	4.98	60000	56,900	0.08	0.26	0.16	0.0	0.4	0.1	0.14	0.27	0.08	0.89	1.11	3.71	
Apr-19	700	0	0.924%	117%	0.00	0.00	0.0		700	0	0.924%	117%	0.00	0.00	0.0	55,500	33	2.94%	117%	1.11	0.20	0.1	0	0	1.535%	117%	0.00	0.00	0.0	3.25	56900	4.98	60000	56,900	0.08	0.27	0.20	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-19	700	0	0.924%	116%	0.00	0.00	0.0		700	0	0.924%	116%	0.00	0.00	0.0	55,500	33	2.94%	116%	1.10	0.20	0.1	0	0	1.535%	116%	0.00	0.00	0.0	3.25	56900	4.98	60000	56,900	0.00	0.00	0.20	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-19	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	55,500	33	2.94%	111%	1.06	0.19	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	56900	4.98	60000	56,900	0.00	0.00	0.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-19	700	0	0.924%	87%	0.00	0.00	0.0		700	0	0.924%	87%	0.00	0.00	0.0	55,500	33	2.94%	87%	0.83	0.15	0.1	0	0	1.535%	87%	0.00	0.00	0.0	3.25	56900	4.98	60000	56,900	0.00	0.00	0.15	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-19	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	55,500	33	2.94%	91%	0.87	0.15	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	56900	4.98	60000	56,900	0.00	0.00	0.15	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-19	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	55,500	33	2.94%	111%	1.06	0.19	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	56900	4.98	60000	56,900	0.00	0.00	0.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-19	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	55,500	33	2.94%	94%	0.90	0.16	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	56900	4.98	60000	56,900	0.00	0.00	0.16	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-19	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	55,500	33	2.94%	94%	0.90	0.16	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	56900	4.98	60000	56,900	0.00	0.00	0.16	0.0	0.2	0.0	0.06	0.10	0.03	0.53	0.72	2.93	
Dec-19	700	0	0.924%	100%	0.00	0.00	0.0		700	0	0.924%	100%	0.00	0.00	0.0	55,500	33	2.94%	100%	0.96	0.17	0.1	0	0	1.535%	100%	0.00	0.00	0.0	3.25	56900	4.98	60000	56,900	0.03	0.10	0.17	0.0	0.3	0.1	0.10	0.18	0.05	0.71	0.92	3.35	
Jan-20	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	59,600	38	2.94%	91%	1.03	0.18	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	61000	5.11	60000	61,000	0.05	0.18	0.18	0.0	0.4	0.1	0.13	0.23	0.07	0.81	1.03	3.56	
Feb-20	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	59,600	38	2.94%	94%	1.06	0.19	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	61000	5.11	60000	61,000	0.07	0.23	0.19	0.0	0.4	0.1	0.15	0.27	0.08	0.88	1.10	3.69	
Mar-20	700	0	0.924%	93%	0.00	0.00	0.0		700	0	0.924%	93%	0.00	0.00	0.0	59,600	38	2.94%	93%	1.05	0.19	0.1	0	0	1.535%	93%	0.00	0.00	0.0	3.25	61000	5.11	60000	61,000	0.08	0.27	0.19	0.0	0.5	0.1	0.16	0.29	0.09	0.92	1.14	3.77	
Apr-20	700	0	0.924%	117%	0.00	0.00	0.0		700	0	0.924%	117%	0.00	0.00	0.0	59,600	38	2.94%	117%	1.31	0.23	0.1	0	0	1.535%	117%	0.00	0.00	0.0	3.25	61000	5.11	60000	61,000	0.09	0.29	0.23	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-20	700	0	0.924%	116%	0.00	0.00	0.0		700	0	0.924%	116%	0.00	0.00	0.0	59,600	38	2.94%	116%	1.30	0.23	0.1	0	0	1.535%	116%	0.00	0.00	0.0	3.25	61000	5.11	60000	61,000	0.00	0.00	0.23	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-20	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	59,600	38	2.94%	111%	1.25	0.22	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	61000	5.11	60000	61,000	0.00	0.00	0.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-20	700	0	0.924%	87%	0.00	0.00	0.0		700	0	0.924%	87%	0.00	0.00	0.0	59,600	38	2.94%	87%	0.98	0.17	0.1	0	0	1.535%	87%	0.00	0.00	0.0	3.25	61000	5.11	60000	61,000	0.00	0.00	0.17	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-20	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	59,600	38	2.94%	91%	1.03	0.18	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	61000	5.11	60000	61,000	0.00	0.00	0.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-20	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	59,600	38	2.94%	111%	1.25	0.22	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	61000	5.11	60000	61,000	0.00	0.00	0.22	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-20	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	59,600	38	2.94%	94%	1.06	0.19	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	61000	5.11	60000	61,000	0.00	0.00	0.19	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-20	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	59,600	38	2.94%	94%	1.06	0.19	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	61000	5.11	60000	61,000	0.00	0.00	0.19	0.0	0.2	0.0	0.07	0.12	0.04	0.57	0.77	3.03	
Dec-20	700	0	0.924%	100%	0.00	0.00	0.0		700	0	0.924%	100%	0.00	0.00	0.0	59,600	38	2.94%	100%	1.13	0.20	0.1	0	0	1.535%	100%	0.00	0.00	0.0	3.25	61000	5.11	60000	61,000	0.04	0.12	0.20	0.0	0.3	0.1	0.12	0.20	0.06	0.76	0.98	3.46	

WLWB Ammonia Model - Lowest Practical Case with High Flow to A418 Surface Mine

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N Input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L	Actual NH4-N concentration (mg/L)
Jan-21	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	63,800	40	2.94%	91%	1.07	0.19	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	65200	5.23	60000	65,200	0.06	0.20	0.19	0.0	0.4	0.1	0.15	0.24	0.08	0.84	1.06	3.62	
Feb-21	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	63,800	40	2.94%	94%	1.11	0.20	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	65200	5.23	60000	65,200	0.08	0.24	0.20	0.0	0.4	0.1	0.17	0.27	0.08	0.90	1.12	3.72	
Mar-21	700	0	0.924%	93%	0.00	0.00	0.0		700	0	0.924%	93%	0.00	0.00	0.0	63,800	40	2.94%	93%	1.10	0.19	0.1	0	0	1.535%	93%	0.00	0.00	0.0	3.25	65200	5.23	60000	65,200	0.08	0.27	0.19	0.0	0.5	0.1	0.18	0.29	0.09	0.93	1.15	3.78	
Apr-21	700	0	0.924%	117%	0.00	0.00	0.0		700	0	0.924%	117%	0.00	0.00	0.0	63,800	40	2.94%	117%	1.37	0.24	0.1	0	0	1.535%	117%	0.00	0.00	0.0	3.25	65200	5.23	60000	65,200	0.09	0.29	0.24	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-21	700	0	0.924%	116%	0.00	0.00	0.0		700	0	0.924%	116%	0.00	0.00	0.0	63,800	40	2.94%	116%	1.36	0.24	0.1	0	0	1.535%	116%	0.00	0.00	0.0	3.25	65200	5.23	60000	65,200	0.00	0.00	0.24	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-21	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	63,800	40	2.94%	111%	1.31	0.23	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	65200	5.23	60000	65,200	0.00	0.00	0.23	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-21	700	0	0.924%	87%	0.00	0.00	0.0		700	0	0.924%	87%	0.00	0.00	0.0	63,800	40	2.94%	87%	1.02	0.18	0.1	0	0	1.535%	87%	0.00	0.00	0.0	3.25	65200	5.23	60000	65,200	0.00	0.00	0.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-21	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	63,800	40	2.94%	91%	1.07	0.19	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	65200	5.23	60000	65,200	0.00	0.00	0.19	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-21	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	63,800	40	2.94%	111%	1.31	0.23	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	65200	5.23	60000	65,200	0.00	0.00	0.23	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-21	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	63,800	40	2.94%	94%	1.11	0.20	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	65200	5.23	60000	65,200	0.00	0.00	0.20	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-21	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	63,800	40	2.94%	94%	1.11	0.20	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	65200	5.23	60000	65,200	0.00	0.00	0.20	0.0	0.2	0.0	0.07	0.12	0.04	0.58	0.78	3.05	
Dec-21	700	0	0.924%	100%	0.00	0.00	0.0		700	0	0.924%	100%	0.00	0.00	0.0	63,800	40	2.94%	100%	1.18	0.21	0.1	0	0	1.535%	100%	0.00	0.00	0.0	3.25	65200	5.23	60000	65,200	0.04	0.12	0.21	0.0	0.3	0.1	0.13	0.21	0.06	0.77	0.98	3.46	
Jan-22	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	59,200	32	2.94%	91%	0.85	0.15	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	60600	5.09	60000	60,600	0.06	0.21	0.15	0.0	0.4	0.1	0.13	0.23	0.07	0.81	1.03	3.55	
Feb-22	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	59,200	32	2.94%	94%	0.88	0.16	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	60600	5.09	60000	60,600	0.07	0.23	0.16	0.0	0.4	0.1	0.14	0.24	0.08	0.84	1.06	3.62	
Mar-22	700	0	0.924%	93%	0.00	0.00	0.0		700	0	0.924%	93%	0.00	0.00	0.0	59,200	32	2.94%	93%	0.87	0.15	0.1	0	0	1.535%	93%	0.00	0.00	0.0	3.25	60600	5.09	60000	60,600	0.08	0.24	0.15	0.0	0.4	0.1	0.14	0.25	0.08	0.86	1.08	3.65	
Apr-22	700	0	0.924%	117%	0.00	0.00	0.0		700	0	0.924%	117%	0.00	0.00	0.0	59,200	32	2.94%	117%	1.09	0.19	0.1	0	0	1.535%	117%	0.00	0.00	0.0	3.25	60600	5.09	60000	60,600	0.08	0.25	0.19	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-22	700	0	0.924%	116%	0.00	0.00	0.0		700	0	0.924%	116%	0.00	0.00	0.0	59,200	32	2.94%	116%	1.08	0.19	0.1	0	0	1.535%	116%	0.00	0.00	0.0	3.25	60600	5.09	60000	60,600	0.00	0.00	0.19	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-22	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	59,200	32	2.94%	111%	1.03	0.18	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	60600	5.09	60000	60,600	0.00	0.00	0.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-22	700	0	0.924%	87%	0.00	0.00	0.0		700	0	0.924%	87%	0.00	0.00	0.0	59,200	32	2.94%	87%	0.81	0.14	0.1	0	0	1.535%	87%	0.00	0.00	0.0	3.25	60600	5.09	60000	60,600	0.00	0.00	0.14	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-22	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	59,200	32	2.94%	91%	0.85	0.15	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	60600	5.09	60000	60,600	0.00	0.00	0.15	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-22	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	59,200	32	2.94%	111%	1.03	0.18	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	60600	5.09	60000	60,600	0.00	0.00	0.18	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-22	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	59,200	32	2.94%	94%	0.88	0.16	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	60600	5.09	60000	60,600	0.00	0.00	0.16	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-22	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	59,200	32	2.94%	94%	0.88	0.16	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	60600	5.09	60000	60,600	0.00	0.00	0.16	0.0	0.2	0.0	0.06	0.10	0.03	0.51	0.71	2.89	
Dec-22	700	0	0.924%	100%	0.00	0.00	0.0		700	0	0.924%	100%	0.00	0.00	0.0	59,200	32	2.94%	100%	0.93	0.16	0.1	0	0	1.535%	100%	0.00	0.00	0.0	3.25	60600	5.09	60000	60,600	0.03	0.10	0.16	0.0	0.3	0.1	0.10	0.17	0.05	0.69	0.90	3.30	
Jan-23	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	54,700	35	2.94%	91%	0.94	0.17	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	56100	4.96	60000	56,100	0.05	0.17	0.17	0.0	0.3	0.1	0.12	0.22	0.07	0.80	1.01	3.52	
Feb-23	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	54,700	35	2.94%	94%	0.97	0.17	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	56100	4.96	60000	56,100	0.07	0.22	0.17	0.0	0.4	0.1	0.13	0.26	0.08	0.87	1.09	3.66	
Mar-23	700	0	0.924%	93%	0.00	0.00	0.0		700	0	0.924%	93%	0.00	0.00	0.0	54,700	35	2.94%	93%	0.96	0.17	0.1	0	0	1.535%	93%	0.00	0.00	0.0	3.25	56100	4.96	60000	56,100	0.08	0.26	0.17	0.0	0.4	0.1	0.15	0.28	0.09	0.91	1.13	3.74	
Apr-23	700	0	0.924%	117%	0.00	0.00	0.0		700	0	0.924%	117%	0.00	0.00	0.0	54,700	35	2.94%	117%	1.20	0.21	0.1	0	0	1.535%	117%	0.00	0.00	0.0	3.25	56100	4.96	60000	56,100	0.09	0.28	0.21	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-23	700	0	0.924%	116%	0.00	0.00	0.0		700	0	0.924%	116%	0.00	0.00	0.0	54,700	35	2.94%	116%	1.19	0.21	0.1	0	0	1.535%	116%	0.00	0.00	0.0	3.25	56100	4.96	60000	56,100	0.00	0.00	0.21	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-23	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	54,700	35	2.94%	111%	1.14	0.20	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	56100	4.96	60000	56,100	0.00	0.00	0.20	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-23	700	0	0.924%	87%	0.00	0.00	0.0		700	0	0.924%	87%	0.00	0.00	0.0	54,700	35	2.94%	87%	0.89	0.16	0.1	0	0	1.535%	87%	0.00	0.00	0.0	3.25	56100	4.96	60000	56,100	0.00	0.00	0.16	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-23	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	54,700	35	2.94%	91%	0.94	0.17	0.1	0	0	1.535%	91%	0.00	0.00	0.0	3.25	56100	4.96	60000	56,100	0.00	0.00	0.17	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-23	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	54,700	35	2.94%	111%	1.14	0.20	0.1	0	0	1.535%	111%	0.00	0.00	0.0	3.25	56100	4.96	60000	56,100	0.00	0.00	0.20	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-23	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	54,700	35	2.94%	94%	0.97	0.17	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	56100	4.96	60000	56,100	0.00	0.00	0.17	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-23	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	54,700	35	2.94%	94%	0.97	0.17	0.1	0	0	1.535%	94%	0.00	0.00	0.0	3.25	56100	4.96	60000	56,100	0.00	0.00	0.17	0.0	0.2	0.0	0.06	0.11	0.03	0.55	0.75	2.99	
Dec-23	700	0	0.924%	100%	0.00	0.00	0.0		700	0	0.924%	100%	0.00	0.00	0.0	54,700	35	2.94%	100%	1.03	0.18	0.1	0	0	1.535%	100%	0.00	0.00	0.0	3.25	56100	4.96	60000	56,100	0.03	0.11	0.18	0.0	0.3	0.1	0.10	0.19	0.06	0.74	0.96	3.41	
Jan-24	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	55,300	10	2.94%	91%	0.27	0.05	0.0	0	0	1.535%	91%	0.00	0.00	0.0	3.25	56700	4.97	60000	56,700	0.06	0.19	0.05	0.0	0.2	0.0	0.08	0.16	0.05	0.66	0.87	3.24	
Feb-24	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	55,300	10	2.94%	94%	0.28	0.05	0.0	0	0	1.535%	94%	0.00	0.00	0.0	3.25	56700	4.97	60000	56,700	0.05	0.16	0.05	0.0	0.2	0.0	0.07	0.14	0.04	0.61	0.81	3.12	
Mar-24	700	0	0.924%	93%	0.00	0.00	0.0		700	0	0.924%	93%	0.00	0.00	0.0	55,300	10	2.94%	93%	0.27	0.05	0.0	0	0	1.535%	93%	0.00	0.00	0.0	3.25	56700	4.97	60000	56,700	0.04	0.14	0.05	0.0	0.2	0.0	0.06	0.12	0.04	0.57	0.77	3.03	
Apr-24	700	0	0.924%	117%	0.00	0.00	0.0		700	0	0.924%	117%	0.00	0.00	0.0	55,300	10	2.94%	117%	0.34	0.06	0.0	0	0	1.535%	117%	0.00	0.00	0.0	3.25	56700	4.97	60000	56,700	0.04	0.12	0.06	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-24	700	0	0.924%	116%	0.00	0.00	0.0		700	0	0.924%	116%	0.00	0.00	0.0	55,300	10	2.94%	116%	0.34	0.06	0.0	0	0	1.535%	116%	0.00	0.00	0.0	3.25	56700	4.97	60000	56,700	0.00	0.00	0.06	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-24	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	55,300	10	2.94%	111%	0.33	0.06	0.0	0	0	1.535%	111%	0.00	0.00	0.0	3.25	56700	4.97	60000	56,700	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jul-24	700	0	0.924%	87%	0.00	0.00	0.0		700	0	0.924%	87%	0.00	0.00	0.0	55,300	10	2.94%	87%	0.25	0.05	0.0	0	0	1.535%	87%	0.00	0.00	0.0	3.25	56700	4.97	60000	56,700	0.00	0.00	0.05	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-24	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	55,300	10	2.94%	91%	0.27	0.05	0.0	0	0	1.535%	91%	0.00	0.00	0.0	3.25	56700	4.97	60000	56,700	0.00	0.00	0.05	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-24	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	55,300	10	2.94%	111%	0.33	0.06	0.0	0	0	1.535%	111%	0.00	0.00	0.0	3.25	56700	4.97	60000	56,700	0.00	0.00	0.06	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-24	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	55,300	10	2.94%	94%	0.28	0.05	0.0	0	0	1.535%	94%	0.00	0.00	0.0	3.25	56700	4.97	60000	56,700	0.00	0.00	0.05	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-24	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	55,300	10	2.94%	94%	0.28	0.05	0.0	0	0	1.535%	94%	0.00	0.00	0.0	3.25	56700	4.97	60000	56,700	0.00	0.00	0.05	0.0	0.0	0.0	0.02	0.03	0.01	0.28	0.43	2.19	
Dec-24	700	0	0.924%	100%	0.00	0.00	0.0		700	0	0.924%	100%	0.00	0.00	0.0	55,300	10	2.94%	100%	0.29	0.05	0.0	0	0	1.535%	100%	0.00	0.00	0.0	3.25	56700	4.97	60000	56,700	0.01	0.03	0.05	0.0	0.1	0.0	0.03	0.06	0.02	0.37	0.54	2.50	
Jan-25	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	55,900	0	2.94%	91%	0.00	0.00	0.0	0	0	1.535%	91%	0.00	0.00	0.0	3.25	57300	4.99	60000	57,300	0.02	0.06	0.00	0.0	0.1	0.0	0.02	0.04	0.01	0.29	0.45	2.25	
Feb-25	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	55,900	0	2.94%	94%	0.00	0.00	0.0	0	0	1.535%	94%	0.00	0.00	0.0	3.25	57300	4.99	60000	57,300	0.01	0.04	0.00	0.0	0.0	0.0	0.01	0.02	0.01	0.23	0.37	2.02	
Mar-25	700	0	0.924%	93%	0.00	0.00	0.0		700	0	0.924%	93%	0.00	0.00	0.0	55,900	0	2.94%	93%	0.00	0.00	0.0	0	0	1.535%	93%	0.00	0.00	0.0	3.25	57300	4.99	60000	57,300	0.01	0.02	0.00	0.0	0.0	0.0	0.01	0.02	0.00	0.18	0.30	1.82	
Apr-25	700	0	0.924%	117%	0.00	0.00	0.0		700	0	0.924%	117%	0.00	0.00	0.0	55,900	0	2.94%	117%	0.00	0.00	0.0	0	0	1.535%	117%	0.00	0.00	0.0	3.25	57300	4.99	60000	57,300	0.00	0.02	0.00	1.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
May-25	700	0	0.924%	116%	0.00	0.00	0.0		700	0	0.924%	116%	0.00	0.00	0.0	55,900	0	2.94%	116%	0.00	0.00	0.0	0	0	1.535%	116%	0.00	0.00	0.0	3.25	57300	4.99	60000	57,300	0.00	0.00	0.00	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Jun-25	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	55,900	0	2.94%	111%	0.00	0.00	0.0	0	0	1.535%	111%	0.00	0.00	0.0	3.25	57300	4.99	60000	57,300	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

WLWB Ammonia Model - Lowest Practical Case with High Flow to A418 Surface Mine

	SURFACE MINE A154								SURFACE MINE A418							UNDERGROUND MINES A418/A154							SURFACE MINE A21							NORTH INLET																	
Date	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Measured ammonia concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	Flow rate (m3/day)	Ammonium Nitrate (ton/month)	AN Dissolution Rate (%)	Rate Factor	AN Dissolved (tonne/month)	NH4-N Dissolved (tonne/month)	NH4-N Concentration (mg/L)	North Inlet Operating Volume (MMm3)	Inflow from Mines (m3/d)	Final Volume (MMm3)	Treatment Capacity (m3/d)	Treatment Rate (m3/day)	Starting NH4-N Concentration (mg/L)	Starting NH4-N (tonnes)	Total NH4-N Input (tonne/month)	Lagged NH4-N Destruction (tonne/month)	NH4-N Before Discharge (tonnes)	NH4-N Concentration before Discharge (mg/L	NH4-N discharged to LdG (tonne)	End NH4-N in North Inlet (tonnes)	Monthly NH4-N Concentration (mg/L)	Maximum Daily NH4-N (mg/L)	95% UCL Monthly NH4-N Conc (mg/L)	95% UCL Maximum Daily NH4-N Conc (mg/L	Actual NH4-N concentration (mg/L)
Jul-25	700	0	0.924%	87%	0.00	0.00	0.0		700	0	0.924%	87%	0.00	0.00	0.0	55,900	0	2.94%	87%	0.00	0.00	0.0	0	0	1.535%	87%	0.00	0.00	0.0	3.25	57300	4.99	60000	57,300	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Aug-25	700	0	0.924%	91%	0.00	0.00	0.0		700	0	0.924%	91%	0.00	0.00	0.0	55,900	0	2.94%	91%	0.00	0.00	0.0	0	0	1.535%	91%	0.00	0.00	0.0	3.25	57300	4.99	60000	57,300	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Sep-25	700	0	0.924%	111%	0.00	0.00	0.0		700	0	0.924%	111%	0.00	0.00	0.0	55,900	0	2.94%	111%	0.00	0.00	0.0	0	0	1.535%	111%	0.00	0.00	0.0	3.25	57300	4.99	60000	57,300	0.00	0.00	0.00	3.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Oct-25	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	55,900	0	2.94%	94%	0.00	0.00	0.0	0	0	1.535%	94%	0.00	0.00	0.0	3.25	57300	4.99	60000	57,300	0.00	0.00	0.00	2.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Nov-25	700	0	0.924%	94%	0.00	0.00	0.0		700	0	0.924%	94%	0.00	0.00	0.0	55,900	0	2.94%	94%	0.00	0.00	0.0	0	0	1.535%	94%	0.00	0.00	0.0	3.25	57300	4.99	60000	57,300	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	
Dec-25	700	0	0.924%	100%	0.00	0.00	0.0		700	0	0.924%	100%	0.00	0.00	0.0	55,900	0	2.94%	100%	0.00	0.00	0.0	0	0	1.535%	100%	0.00	0.00	0.0	3.25	57300	4.99	60000	57,300	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	

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February 9, 2006

File: N7L2-1645

Diavik Distribution List

The WLWB Ammonia Management Plan Expert Panel's report is ready for your review. If you recall, we formed this panel back in December after soliciting your suggestions for panel members. The three-member panel visited the mine site in January and prepared their report based on the Statement of Work, which all parties had an opportunity to review.

The panel's report includes recommended ammonia management options, a recommendation for the ammonia EQC, an assessment of whether DDMI's draft AMP will enable the company to meet the panel's recommended EQC, and recommendations to the Board for a revised AMP. The panel also included a model to predict ammonia concentrations in the effluent.

The report will be distributed by email later today but it is too large to fax. By the end of the day, the report will be on our website at http://www.mvlwb.com/pdf/pre2000Water/N7L2-1645/Report/AmmMgmt/AMP/AMP-ExpertPanelReport-Feb07.pdf. If you would like a hardcopy by mail, please let me know ASAP.

Several times during preparation of their report, the panel requested information from DDMI (e.g., raw data regarding ammonia concentrations, geology maps, A154 pit floor hydraulics study, etc.). This information was provided in numerous files of various formats. We have zipped up the info and placed it on the website at http://www.mvlwb.com/pdf/pre2000Water/N7L2-1645/Report/AmmMgmt/AMP/AMP-Expert-AdditionalInfo.pdf . This information is not for review; it is provided to you so that you have the same information the panel had. If you are attempting to access it and have any difficulties, please let me know and I can send you the files.

Please submit comments on the panel's report by February 23, 2007.

Based on your comments, additional input from the panel as required, and evidence presented at the public hearing in November last year, the Board will issue a directive to DDMI regarding a revised AMP on March 16, 2007. If you have any questions, please contact me.

Sincerely,

Patty Ewaschuk

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