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RIO TINTO - IOC

Wabush 3 Hydrology Technical Report

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REPORT

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Executive Summary

Iron Ore Company of Canada (IOC) owns and operates a series of open pit iron ore mines near Labrador City, Labrador. These mines are comprised of the Spooks, Lorraine, Humphrey Main and South, Sherwood and Luce Pits. IOC has additional land to the south of these pits, referred to as the Wabush 3 site which requires additional study to meet the Environmental Impact Statement (EIS) requirements. As a part of the EIS, Golder Associates Ltd. (Golder) was retained to complete a hydrological study for the Wabush 3 proposed pit site.

The main objectives of this study were to complete a detailed water balance for four stages of mine development (existing conditions, Phase 1 mine development, Phase 3 mine development and post-closure); assess flood flows within the project area by developing a hydrologic model; complete a water management strategy taking into consideration water quality and quantity effects; provide conceptual design of a collection pond within Wabush 3; and complete an effects assessment to assess water quality and water quantity effects to the watershed areas that will change due to extraction of Wabush 3.

The initiation of the study included a review of background information, including previously collected data and reports. Drainage delineation based on existing conditions were obtained from previous studies, and stage storage curves were developed based on bathymetry data for selected local lakes. Interpretation of continuous and manual water level data, as well as water quality data from previous monitoring activities, was conducted. Under existing conditions two streams cross Wabush 3, one located within the Dumbell Lake watershed and one within the Leg Lake watershed; previous monitoring results indicate that groundwater discharge provides a significant component of flow to these streams.

Pit development of Wabush 3 will reduce the total drainage area, and the runoff and infiltration contributions within the Leg Lake and Dumbell Lake regional watersheds, as well as to Leg Lake itself, while the hydrology within White Lake and Luce Pit may be altered by development of the waste rock stockpile. Phase 3 Mine Development extends over an area of approximately 245 ha, with an average annual surplus of approximately 1,140,000 m^3/year. Runoff accounts for 100% of the total surplus within the Wabush 3 Pit, which will flow to the proposed water management pond.

Average annual reductions in surplus to the Dumbell Lake, Leg Lake and White Lake regional watersheds were estimated to be approximately 14%, 3% and an increase of 2% during Phase 1 mine development, and 15%, 8% and an increase of 2% during Phase 3 mine development, respectively. The reduction in average annual surplus to Leg Lake was estimated to be approximately 8% and 19% during Phase 1 and Phase 3 of mine development, respectively.

Hydrological modelling results indicate that inflows to Harrie Lake from the Leg Lake regional watershed will not experience increases during Wabush 3 development, rather, peak flood flows and runoff volumes will decrease. Based on these results, increases to the water level within Harrie Lake are not anticipated as a result of mine development.

A comparison between groundwater and surface water quality was completed as part of previous monitoring studies. The results concluded that there was a significant groundwater inflow to the stream crossing Wabush 3 within the Leg Lake watershed, as evident by elevated concentrations of iron, aluminum, titanium and chromium which may be attributed to groundwater flow through iron formations. Water quality results for the stream crossing Wabush 3 within the Dumbell Lake watershed did not show high levels of iron, aluminum, titanium or chromium.

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1.0 INTRODUCTION

Iron Ore Company of Canada (IOC) owns and operates a series of open pit iron ore mines near Labrador City, Labrador. These mines are comprised of the Spooks, Lorraine, Humphrey Main and South, Sherwood and Luce Pits (Figure 1). IOC has additional land to the south of these pits, referred to as the Wabush 3 site, which requires additional study to meet Environmental Impact Statement (EIS) requirements. As a part of the EIS, Golder Associates Ltd. (Golder) was retained to complete a hydrological study for the Wabush 3 proposed pit site.

1.1 Overview of Project

The main objectives of the hydrological study are to:

- Complete a detailed water balance analysis for four stages of the mine development: current/existing conditions, Phase 1 mine development, Phase 3 mine development and post-closure scenario. The water balance analysis will include average, wet and dry year scenarios.
- Develop a hydrological model to describe the hydrological regime in the region, assess flood flows within the project area and estimate projected return period flows contributing to Harrie Lake due to the change in drainage area within the Leg Lake watershed.
- Complete a water management strategy which will take into consideration water quality and quantity effects, and project water demands/uses.
- Conceptually design a collection pond within Wabush 3 for water management purposes.
- Complete an effects assessment to assess water quality and water quantity effects to the watershed areas that will change due to extraction of the pit.

This report is organized into the main text and supporting figures, tables and appendices. The main text provides a discussion of the project and local watershed areas, characterization of the hydrologic environments, water balance analysis, hydrological model results, water management strategy, potential effects and the conclusions and recommendations.

1.2 IOC Background Information

The following information was provided to Golder by IOC and used as a part of this study:

- Historic Reports
  - Technical Memorandum Groundwater Modeling Predictive Results for IOC Wabush 3 Project (Rio Tinto, May 2014)
  - Wabush 3 and Wabush 6 Hydrogeological and Hydrological Technical Report (Golder, April 2012)
  - Site Water Balance Carol Lake Mine (Piteau Associates Engineering Ltd., March 2011)

  - Surface Water and Hydrology Baseline Report for Proposed Wabush 3 Mine Site (Amec Environmental & Infrastructure, revised November 2013)
- Bathymetric data (Dumbell Lake, Leg Lake, Pumphouse Pond, Drum Lake, White Lake)
- Groundwater quality information
- Water level and flow data collected by AMEC in July 2012 at stations SW2 and SW7
- Topographic information (using mine grid datum)
- Estimated recharge within the Wabush 3 project area and local watersheds.
- Phase 1 and Phase 3 mine development scenarios

1.3 Background Review

A review of previously collected data and reports was completed. The following tasks were completed as part of the background review:

- Delineation of the drainage areas based on existing conditions to all local lakes (Dumbell Lake, Pumphouse Pond, Drum Lake, Leg Lake, White Lake, Luce Lake and Harrie Lake), as obtained from the Golder 2012 report for Wabush 3 (Golder 2012), with the exception of White Lake and Luce Pit, for which the drainage area was delineated based on existing topography;
- Analysis and interpretation of continuous and manual water level data from previous monitoring activities (Golder 2012, Amec 2012);
- Collection of existing pre-development hydrological data, such as water levels, bathymetry and flow rates in local streams and selected local lakes, including Dumbell Lake, Pumphouse Pond, Drum Lake, Leg Lake, and White Lake, plus identification of data gaps; and
- Review of water quality data from current and previous monitoring activities at the Wabush 3 development.

2.0 WATERSHED CHARACTERIZATION AND STREAM FLOW ANALYSIS

2.1.1 Watershed Characterization

The following sections characterize each of the three watershed areas within the regional watershed boundary (refer to Figure 2).

2.1.1.1 Luce Lake Watershed

The Luce Lake watershed upstream of the confluence with Dumbell Lake watershed (surface water monitoring location SW5) is approximately 13 km^2, as shown on Figure 2. The watershed area consists of coniferous forest, walking trails, lakes, pits and industrial waste piles (i.e., tailings). The soils within the area consist of granular till that is poorly sorted silt, sand and gravel and bedrock at surface in the north east portion of the watershed.

In conjunction with the runoff and infiltration from the upstream catchment, Luce Lake also receives discharge from the Luce Pit located directly to the south. The Luce Pit has a drainage area of approximately 2.6 km^2 in addition to the 13 km^2 drainage area of Luce Lake.

Luce Lake drains in a south-easterly direction towards Wabush Lake and across the IOC tailings basins.

2.1.1.2 Dumbell Lake Watershed

Dumbell Lake has a drainage area of approximately 8 km^2 (refer to Figure 2 and surface water monitoring location SW3) and is the secondary source of municipal water to Labrador City. The watershed area consists of coniferous forest, walking trails, a ski hill and lakes. The soils within the area consist of granular till that is comprised of poorly sorted silt, sand and gravel.

Dumbell Lake receives upstream runoff and infiltration from approximately half of the proposed Wabush 3 area (1.1 km^2). As shown on Figure 2, Dumbell Lake watershed confluences with the Luce Lake watershed east of Wabush Lake prior to draining into Wabush Lake.

2.1.1.3 Leg Lake Watershed

Leg Lake has a drainage area of approximately 16 km^2 and confluences with Harrie Lake (refer to Figure 2, surface water monitoring location SW10). The watershed area consists of coniferous forest, lakes, walking trails, roads and residential areas (Labrador City). The watershed area consists mostly of bedrock at surface and large areas of granular till and other surficial soils.

The south-western half of Wabush 3 is located in the Leg Lake watershed area and contains two lakes which drain southwest into Leg Lake, Pumphouse Pond and Drum Lake.

2.1.2 Flow Analysis at SW2 and SW7

Surface water flow monitoring was conducted at 11 locations in 2011 (Golder 2012) and six locations in 2012 (Amec 2012) as shown on Figure 2. The locations monitored in 2011 and 2012 were installed in approximately the same locations, however, slightly different catchment areas are reported in Table 1, due to slight variations in the monitoring locations. The locations monitored in 2011 and 2012 are referred to using two naming conventions (i.e., “SW1”, “Gauge 1”, respectively) throughout the report to avoid confusion.

The measured instantaneous flows and drainage area upstream of each location were used to estimate the instantaneous unit flow per square kilometre (L/s/km^2) within each catchment, as provided in Table 1.

Table 1: Summary of Surface Water Flow Monitoring Data

Date	Location	Measured Flow (L/s)	Catchment (km^2)	Unit Flow ($L/s/km^2$)	Median Flow (L/s)	Notes
Sept 16, 2011	SW1	5	1.0	5	3.4	Located in Wabush 3
July 14, 2012	Gauge 1	1.4	0.9	2		
Aug 15, 2012	Gauge 1	9.2	0.9	10		
Sept 14, 2012	Gauge 1	1.7	0.9	2		
Sept 16, 2011	SW2	83	1.8	45	92.3	Downstream of Falls; upstream of Dumbell Lake
July 10, 2012	Gauge 2	94.5	2.7	35		
July 14, 2012	Gauge 2	78.9	2.7	29		
July 24, 2012	Gauge 2	126.7	2.7	47		
Aug 15, 2012	Gauge 2	90.1	2.7	34		
Sept 14, 2012	Gauge 2	62.6	2.7	23		
Sept 15, 2012	Gauge 2	127.9	2.7	48		
Sept 15, 2012	Gauge 2	85.5	2.7	32		
Sept 15, 2012	Gauge 2	100.1	2.7	37		
Sept 16, 2012	Gauge 2	161.0	2.7	60		
Sept 16, 2011	SW3	219	8.3	26	117.1	Downstream of Dumbell Lake
July 14, 2012	Gauge 3	116.7	6.2	19		
Aug 15, 2012	Gauge 3	247.0	6.2	40		
Sept 14, 2012	Gauge 3	117.5	6.2	19		
Sept 16, 2011	SW7	22	1.1	21	15.9	Located in Wabush 3
July 10, 2012	Gauge 7	10.6	1.1	9		
July 14, 2012	Gauge 7	3.2	1.1	3		
July 24, 2012	Gauge 7	39.3	1.1	34		
Aug 15, 2012	Gauge 7	29.0	1.1	25		
Sept 14, 2012	Gauge 7	5.5	1.1	5		
Sept 15, 2012	Gauge 7	20.8	1.1	18		
Sept 15, 2012	Gauge 7	15.9	1.1	14		
Sept 15, 2012	Gauge 7	15.5	1.1	14		
Sept 16, 2012	Gauge 7	52.9	1.1	46		
Sept 16, 2011	SW8	180	7.2	25	213.9	Downstream of Leg Lake
July 14, 2012	Gauge 8	226.1	8.6	26		
Aug 15, 2012	Gauge 8	329.0	8.6	38		
Sept 14, 2012	Gauge 8	201.7	8.6	23		
Sept 16, 2011	SW9	21	3.3	6	21	Upstream of Tanya Lake

Date	Location	Measured Flow (L/s)	Catchment (km^2)	Unit Flow ($L/s/km^2$)	Median Flow (L/s)	Notes
Sept 16, 2011	SW10	199	16.0	12	199	Downstream of SW8 and SW9; Upstream of Harrie Lake confluence
Sept 17, 2011	SW11	63	2.1	30	51.9	Upstream of Dumbell Lake
July 14, 2012	Gauge 11	43.9	2.1	21		
Aug 15, 2012	Gauge 11	59.9	2.1	28		
Sept 14, 2012	Gauge 11	24.6	2.1	12		

Continuous water level monitoring was conducted at Gauge 2 and Gauge 7 from July 10 to October 19, 2012 (Amec 2012).

Stream flow at locations SW2 (Gauge 2) and SW7 (Gauge 7) are likely to be influenced by extraction at Wabush 3, as both are located on streams with headwaters within the Wabush 3 boundary. SW2 is located east of Wabush 3, within the Dumbell Lake catchment area. Unit flows for SW2 are relatively high compared to other stream flow locations in the area (i.e., SW1, which is located approximately 1 km upstream); indicating that there are significant baseflow contributions between SW1 and SW2. Continuous water level monitoring at Gauge 2 in 2012 indicated that low flow reached approximately 60 Litres per second (L/s) in mid-August, with increases in flow occurring in response to precipitation (Amec 2013).

SW7 is located west of Wabush 3, within the Leg Lake catchment and downstream of Pumphouse Lake. Unit flows for SW7 were not as high as those at SW2, but higher than others in the area (i.e., SW1); indicating groundwater discharge provides a component of stream flow at SW7. Continuous water level monitoring at Gauge 7 in 2012 indicated that low flows reached approximately 3 L/s in mid-July, with increases in flow occurring in response to precipitation (Amec 2013).

2.1.3 Surface Water Diversions Due to Pit Extraction

Under existing conditions there are two streams that cross Wabush 3. One stream is located within the Dumbell Lake watershed and flows towards Dumbell Lake. The second stream flows south-west towards Leg Lake. There are no streams that flow onto Wabush 3 from outside of the proposed pit boundary. Therefore, no streams require a surface water diversion around the pit. It is assumed that the pit will be bermed along the perimeter to divert runoff from the north around the pit to reduce potential pumping efforts.

Monitoring locations SW1 and SW7 (shown on Figure 2) are located within the proposed Wabush 3 Pit boundary. Monitoring location SW1 is located within the Dumbell Lake watershed at the proposed pit boundary and SW7 is located within the Leg Lake watershed near the proposed pit boundary.

Dumbell Lake

Based on the instantaneous measured flow at SW1 in 2011 and 2012 the unit flow ranged from approximately 5 L/s/km^2 on September 16, 2011 to 2 L/s/km^2 in July and September 2012, and 10 L/s/km^2 on August 15, 2012. SW2 is located downstream of SW1 (Wabush 3) and upstream of Dumbell Lake. The unit flow for this catchment area was approximately 45 L/s/km^2 on September 16, 2011 which is nine times more than what was measured at SW1 on the same day. The unit flow on July 14, 2012 and September 14, 2012 at SW2 was more than ten times the measured flow at SW1 on the same day. The majority of the drainage area to SW2 is located upstream of SW1, which suggests that SW2 receives a significant amount of groundwater discharge.

Monitoring location SW11 is located on a tributary at the south west side of Dumbell Lake and will not be affected by the Wabush 3 Pit extraction. The unit flow for this catchment area was approximately 30 L/s/km^2 on September 16, 2011 which suggests that SW11 also could receive a significant groundwater input.

Moving downstream to SW3, downstream of Dumbell Lake, the unit flow decreases to 26 L/s/km^2 on September 16, 2011 and 19 L/s/km^2 on July 14 and September 14, 2012 reflecting a large watershed with a corresponding large lake.

Leg Lake

Monitoring location SW7 is located in the headwaters of the south western drainage area directly upstream of Drum Lake and downstream of Pumphouse Pond. Since Drum Lake and Leg Lake are downstream of SW7 and upstream of SW8, a comparison between these two stations would not accurately represent the groundwater contribution over the increased amount of drainage area. By comparing SW7 to SW1, since both locations are within the Wabush 3 site, SW7 was estimated to have a unit flow of 21 L/s/km^2 on September 16, 2011 and 25 L/s/km^2 on August 15, 2012 which is three to four times greater than SW1 on the same day. However, the unit flows on July 14, 2012 and September 14, 2012 at SW7 were in the same order of magnitude as SW1 with unit flows of 2 and 3 L/s/km^2 on July 14, 2012 and 2 and 5 L/s/km^2 on September 14, 2012, respectively. This indicates that SW7 could receive groundwater input during certain times of the year and may recharge the groundwater during other times of the year. Moving downstream to SW8, downstream of Leg Lake, the unit flow was approximately 25 L/s/km^2 which is comparable to SW3.

Monitoring location SW9 is located upstream of Tanya Lake and Harrie Lake and will not be affected by the Wabush 3 Pit extraction. SW9 has a drainage area of 3.3 km^2; and the unit flow for this catchment area was approximately 6 L/s/km^2 on September 16, 2011, indicating that the rock may be tighter within this area (relative to other areas) minimizing the groundwater contribution upstream of this location.

3.0 WATER BALANCE ASSESSMENT

3.1 Regional Climate

The regional study area has a sub-arctic continental taiga climate with very severe winters. Meteorological data was obtained for the Wabush Airport station (Climate ID 8504175) from Environment Canada (EC) for the period of record of 1961 – 2012. Daily average temperatures exceed 0°C for 6 months of the year. Daily mean temperatures at the Wabush Airport average – 22°C and – 20°C in January and February, respectively. Mean daily average temperatures in July and August are 14°C and 12°C, respectively. Snowfall from November to

March generally exceeds 60 cm per month and the wettest summer month is July, with an average rainfall of 112 mm.

Figure 3 provides the annual precipitation for the period of record and the average annual precipitation. The average annual precipitation for the region is 877 mm based on the Wabush Airport period of record from 1961 – 2012.

Water balances were prepared for three meteorological scenarios – the average, wet and dry years. The wet and dry years were selected as the years with the highest and lowest annual precipitation, respectively, for the Wabush Airport period of record. The wettest year was 1983 with an annual precipitation of 1,185.1 mm, while the driest year was 1991 with an annual precipitation of 674.1 mm.

3.2 Methodology

A water balance estimates the amount of available water (i.e., surplus) generated from a unit area of land. Using climate data (precipitation and temperature), the daily precipitation is broken into rainfall (when the temperature is above 0°C) and snow (when the temperature is below 0°C). The snow is added to an assumed snowpack, which in turn is assumed to melt in warmer weather, with the rate of melting based on daily temperatures and a degree-day snowmelt model. The rain and snowmelt for each day are both assumed to contribute to soil water storage, while an estimated daily evapotranspiration is removed from this storage. The maximum soil storage is based on soil type and land use and is quantified using a Water Holding Capacity (WHC). At the end of each daily time step, any water in excess of the assumed maximum soil storage (WHC) becomes surplus, and is available for runoff or infiltration. The remaining amount below the WHC is carried over as soil storage to the next day. In general, for a given set of climate data, the WHC values dictate the amount of surplus available; producing higher surplus values from land surfaces with low WHC values, since it takes less rain and snowmelt to fill the soil storage leaving more as excess, and lower surplus values from land surfaces with high WHC values, since it takes more rain and snowmelt to fill the soil storage, leaving less as excess.

Precipitation which falls on the Site either infiltrates or results in runoff. Surplus water, which consists of runoff and infiltration, remains after actual evapotranspiration has been removed and maximum soil or snow pack storage is exceeded. The WHC is specific to the soil type and land use; the types of surficial soil on the Site were selected based on a review of surficial geology obtained from Newfoundland Labrador GeoScience Atlas (2011), as shown on Figure 4. Based on the surficial soil type, and using the guidelines provided in the *Ministry of Environment (MOE) Stormwater Management Planning and Design Manual*, dated March 2003 (SWM Manual), the appropriate water holding capacity was selected. Water holding capacity is not a sensitive parameter for estimation of surplus in areas receiving a moderate amount of precipitation, in the range of approximately 50 mm to 150 mm.

The surplus within the catchment areas was distributed into runoff and infiltration components in accordance with Ontario MOE Guidelines (MOE 2003). Since these are high-level estimates, they are typically only applied on an annual basis, and generally represent uncertainty when looking at a daily or monthly time step. Infiltration factors were selected for the various types of soil, topography and land use. In order to estimate the amount of annual infiltration the surplus was multiplied by the infiltration factor. Based on the topography and soils of the catchments, an infiltration factor of 0.5 (50% of surplus as infiltration) was used for forested areas with sand and gravel soil and 0.6 (60% of surplus as infiltration) was used for the waste rock and overburden piles during

Phase 1 and 3. The remainder of the surplus is assumed to be surface runoff. The lake areas, which are assumed to contribute wholly to the volume of the lake with no infiltration losses, were assigned an infiltration factor of 0. While the proposed pit area (i.e., exposed rock), which will be below the existing ground level without a surface outlet, was assigned an infiltration factor of 0 and all surplus is assumed to contribute to the pit pond and be pumped out.

3.3 Drainage Scenarios

Water balances were prepared to estimate the flows generated within the Dumbell Lake, Leg Lake and White Lake watersheds, and for the Wabush 3 Pit and Luce Pit. Drainage areas for these watersheds are shown on Figure 2.

Four scenarios were considered for each watershed, including Existing Conditions, Phase 1 Mine Development, Phase 3 Mine Development and Post-Closure Conditions. Under Existing Conditions, Dumbell Lake, Leg Lake and White Lake consist primarily of undisturbed forested area and water bodies, including the lakes themselves. The southern portion of the Leg Lake regional watershed also includes a small residential area. Luce Pit consists mostly of excavated area and water bodies (i.e., ponds).

During Phase 1, development of the Wabush 3 Pit will extend approximately 117 ha into the Dumbell Lake watershed and approximately 43 ha into the Leg Lake watershed (see Figure 5). An overburden stockpile will be located within the Leg Lake watershed during Phase 1, and a waste rock stockpile located northwest of Wabush 3 will be present within the Leg Lake, White Lake and Luce Pit watershed areas during Phases 1 and 3.

During Phase 3, the Wabush 3 Pit will extend further to the west, mostly into the Leg Lake watershed, and the overburden stockpile will extend to the east, remaining entirely within the Leg Lake watershed (see Figure 6).

Under the Post-Closure scenario, the Wabush 3 Pit will be flooded with water, and the overburden stockpile located in the Leg Lake watershed area will be removed. The waste rock stockpile will remain under Post-Closure conditions, and will be re-vegetated (see Figure 7).

Approximate water holding capacities were selected for the various land uses within each catchment, and are summarized in Table 2. The overburden thickness in the vicinity of Wabush 3 was based on available borehole logs which showed an average overburden thickness of approximately 1.5 m. Thornthwaite water budget data were obtained from Environment Canada (including surplus, potential and actual evapotranspiration) for the relevant water holding capacities.

Table 2: Water Holding Capacity for Each Land Use and Soil Type

Watershed Area	Description	Water Holding Capacity (mm)	Topography/Soil Type/Ground Cover	Infiltration Factor	% Infiltration
Leg Lake	Residential and Industrial Area	3	Paved	0	0
Dumbell Lake, Leg Lake, White Lake	Forested Areas	150	'-Hilly Land, average slope 28 m to 47 m/km - poorly sorted Till (silty, gravel and sandy gravel) - Woodlot	0.1 0.2 0.2	50
Leg Lake, White Lake and Luce Pit	Waste Rock and Overburden Pile	50	'-Flat Land, average slope <0.6 m/km - poorly sorted Till (silty, gravel and sandy gravel)	0.3 0.3	60
Dumbell Lake, Leg Lake, White Lake, Luce Pit	Wetlands and Lakes	Precipitation - PE		0	0
Leg Lake, White Lake, Luce Pit	Waste Rock and Previous Overburden Area vegetated	100	'-Flat Land, average slope <0.6 m/km - poorly sorted Till (silty, gravel and sandy gravel)	0.3 0.3	60
Wabush 3, Luce Pit	Open Pit	40	'-Flat Land, average slope <0.6 m/km - bedrock	0	0

Note: PE – Potential Evapotranspiration

3.4 Results

Water balances for the four mine development scenarios (Existing Conditions, Phase 1, Phase 3 and Post-Closure) are presented for the average, wet and dry year scenarios. The watershed and pit water balances do not take into consideration the dewatering of groundwater, from the pit, that may be directed to each watershed.

The detailed water balance tables are provided in Appendix A. The results of the water balance analyses are summarized in the following sections.

3.4.1 Dumbell Lake

Under Existing Conditions, the average annual surplus within the Dumbell Lake watershed is approximately 3,696,000 m^3/year or 446 mm/year. Runoff accounts for approximately 57% of the total surplus within the

watershed, while the remaining 43% infiltrates by contributing to either groundwater recharge or baseflow. The annual surplus during a wet year (1983) is approximately 5,337,000 m^3 and 2,469,000 m^3 during a dry year (1991). The monthly and annual surpluses are presented in Tables 3, 4 and 5 (attached to this report) for the average, wet and dry years, respectively.

Under Phase 1 of the Wabush 3 Mine Development, the watershed area to Dumbell Lake will be reduced by approximately 117 ha. The existing runoff and infiltration within the 117 ha will contribute to the Wabush 3 Pit as runoff to the proposed water management pond. This will result in a loss of total surplus within the Dumbell Lake watershed, compared to existing conditions, of approximately 14% which equates to a total surplus of approximately 3,174,000 m^3 during an average year, 4,600,000 m^3 during a wet year (1983) and 2,113,000 m^3 during a dry year (1991).

Under Phase 3 of the Wabush 3 Mine Development, the watershed area to Dumbell Lake will be reduced by approximately 125 ha (an additional 8 ha from Phase 1). The existing runoff and infiltration within the 125 ha will contribute to the Wabush 3 Pit as runoff to the proposed water management pond. This will result in a loss of total surplus within the Dumbell Lake watershed, compared to existing conditions, of approximately 15% which equates to a total surplus of approximately 3,137,000 m^3 during an average year, 4,547,000 m^3 during a wet year (1983) and 2,088,000 m^3 during a dry year (1991).

Post-Closure surpluses are consistent with those estimated for Phase 3.

3.4.2 Leg Lake

The Leg Lake watershed was analysed based on a regional scale (i.e., to the confluence with Harrie Lake) and a local scale focusing on the catchment area contributing to Leg Lake.

Leg Lake – Regional Scale

Under Existing Conditions, the average annual surplus within the Leg Lake watershed is approximately 7,142,000 m^3/year, or 446 mm/year. Runoff accounts for approximately 54% of the total surplus within the watershed, while the remaining 46% infiltrates by contributing to either groundwater recharge or baseflow. The annual surplus during a wet year (1983) is approximately 10,213,000 m^3 and 4,821,000 m^3 during a dry year (1991). The monthly and annual surpluses are presented in Tables 6, 7 and 8 (attached to this report) for the average, wet and dry years, respectively.

Under Phase 1 of the Wabush 3 Mine Development, the watershed area to Leg Lake will be reduced by approximately 43 ha. The existing runoff and infiltration within the 43 ha will contribute to the Wabush 3 Pit as runoff to the proposed water management pond. This will result in a loss of total surplus within the Leg Lake watershed, compared to existing conditions, of approximately 3% which equates to a total surplus of approximately 6,963,000 m^3 during an average year, 9,168,000 m^3 during a wet year (1983) and 4,716,000 m^3 during a dry year (1991).

Under Phase 3 of the Wabush 3 Mine Development, the watershed area to Leg Lake will be reduced by approximately 125 ha (an additional 82 ha from Phase 1). The existing runoff and infiltration within the 125 ha will contribute to the Wabush 3 Pit as runoff to the proposed water management pond. This will result in a loss of total surplus within the Leg Lake watershed, compared to existing conditions, of approximately 8% which

equates to a total surplus of 6,598,000 m^3 during an average year, 9,419,000 m^3 during a wet year (1983) and 4,472,000 m^3 during a dry year (1991).

The Post-Closure scenario assumes that the overburden stockpile will be removed and the area will be vegetated and that the waste rock pile will be vegetated. A WHC for the overburden and waste rock areas of 100 mm was chosen due to vegetation of the ground surface compared to 50 mm WHC used when these areas were bare soil/rock. The total surplus within the Leg Lake watershed will decrease, compared to existing conditions, by approximately 8% (average year) compared to existing conditions due to the increase in vegetation. This will result in a total surplus of approximately 6,583,000 m^3 during an average year, 9,269,000 m^3 during a wet year (1983) and 4,472,000 m^3 during a dry year (1991).

During Phase 1 and Phase 3 of mine development, surplus from the waste rock stockpile accounts for approximately 5% of the total surplus within the Leg Lake watershed. Any water quality impact from the waste rock stockpile would therefore experience dilution before ultimately out-letting at Harrie Lake. However, a geochemical analysis of the waste rock water quality has not been completed.

Leg Lake – Local Scale

Under Existing Conditions, the average annual surplus within the Leg Lake catchment is approximately 2,915,000 m^3/year, or 446 mm/year. Runoff accounts for approximately 56% of the total surplus within the catchment, while the remaining 44% infiltrates by contributing to either groundwater recharge or baseflow. The annual surplus during a wet year (1983) is approximately 4,205,000 m^3 and 1,950,000 m^3 during a dry year (1991). The monthly and annual surpluses are presented in Tables 9, 10 and 11 (attached to this report) for the average, wet and dry years, respectively.

Under Phase 1 of the Wabush 3 Mine Development, the catchment area to Leg Lake will be reduced by approximately 43 ha. The existing runoff and infiltration within the 43 ha will contribute to the Wabush 3 Pit as runoff to the proposed water management pond. This will result in a loss of total surplus within the Leg Lake catchment, compared to existing conditions, of approximately 8% which equates to a total surplus of approximately 2,682,000 m^3 during an average year, 3,869,000 m^3 during a wet year (1983) and 1,798,000 m^3 during a dry year (1991).

Under Phase 3 of the Wabush 3 Mine Development, the catchment area to Leg Lake will be reduced by approximately 125 ha. The existing runoff and infiltration within the 125 ha will contribute to the Wabush 3 Pit as runoff to the proposed water management pond. This will result in a loss of total surplus within the Leg Lake catchment, compared to existing conditions, of approximately 19% which equates to a total surplus of approximately 2,357,000 m^3 during an average year, 3,398,000 m^3 during a wet year (1983) and 1,581,000 m^3 during a dry year (1991).

The Post-Closure scenario assumes that the overburden stockpile will be removed and the area will be vegetated and that the waste rock pile will be vegetated. A WHC for the overburden and waste rock areas of 100 mm was chosen due to vegetation of the ground surface compared to 50 mm WHC used when these areas were bare soil/rock. The total surplus within the Leg Lake catchment, compared to existing conditions, will decrease by approximately 19% (average year) compared to existing conditions due to the increase in vegetation. This will result in a total surplus of approximately 2,351,000 m^3 during an average year, 3,356,000 m^3 during a wet year (1983) and 1,626,000 m^3 during a dry year (1991).

During Phase 1 and Phase 3 of mine development, surplus from the waste rock stockpile accounts for approximately 5-6% of the total surplus within the Leg Lake catchment. Any water quality impact from the waste rock stockpile would therefore experience dilution before ultimately out-letting at Harrie Lake. However, a geochemical analysis of the waste rock water quality has not been completed.

3.4.3 White Lake

Under Existing Conditions, the average annual surplus within the White Lake watershed is approximately 1,489,000 m^3/year, or 446 mm/year. Runoff accounts for approximately 62% of the total surplus within the watershed, while the remaining 38% infiltrates by contributing to either groundwater recharge or baseflow. The annual surplus during a wet year (1983) is approximately 2,187,000 m^3 and 978,000 m^3 during a dry year (1991). The monthly and annual surpluses are presented in Tables 12, 13 and 14 (attached to this report) for the average, wet and dry years, respectively.

Under Phases 1 and 3 of the Wabush 3 Mine Development, the watershed area to White Lake will include approximately 35 ha of waste rock stockpile. This will result in an increase of total surplus within the White Lake watershed of approximately 0.3% (average annual conditions) which equates to a total surplus of approximately 1,494,000 m^3 during an average year, 2,188,000 m^3 during a wet year (1983) and 990,000 m^3 during a dry year (1991).

The Post-Closure scenario assumes that the waste rock pile will be vegetated. A WHC for the waste rock area of 100 mm was chosen due to vegetation of the ground surface compared to 50 mm WHC used when this area is bare rock. The total surplus within the White Lake watershed will decrease by approximately 0.1% compared to existing conditions due to the increase in vegetation. This will result in a total surplus of approximately 1,488,000 m^3 during an average year, 2,187,000 m^3 during a wet year (1983) and 979,000 m^3 during a dry year (1991).

During Phase 1 and Phase 3 of mine development, surplus from the waste rock stockpile accounts for approximately 12% of the total surplus within the White Lake watershed. Water quality impact from the waste rock stockpile would therefore experience dilution before ultimately draining to White Lake. However, a geochemical analysis of the waste rock water quality has not been completed.

3.4.4 Wabush 3 Pit

Under Existing Conditions, the areas within the Wabush 3 Pit footprint drain to Leg Lake and Dumbell Lake.

The total area for Phase 1 Mine Development is approximately 160 ha, with an average annual surplus of approximately 742,000 m^3/year. The annual surplus during a wet year (1983) is approximately 1,010,000 m^3 and 553,000 m^3 during a dry year (1991). Runoff accounts for 100% of the total surplus within the Wabush 3 Pit, which will flow to the proposed water management pond. The monthly and annual surpluses are presented in Tables 15, 16 and 17 (attached to this report) for the average, wet and dry years, respectively.

Phase 3 Mine Development extends over an area of approximately 250 ha, with an average annual surplus of approximately 1,162,000 m^3/year. The annual surplus during a wet year (1983) is approximately 1,581,000m^3

and 866,000 m^3 during a dry year (1991). Runoff accounts for 100% of the total surplus within the Wabush 3 Pit, which will flow to the proposed water management pond.

The Post-Closure scenario assumes that the pit will be fully flooded. Precipitation minus Potential Evapotranspiration was used as the water holding capacity assuming 0% infiltration. Precipitation that falls within the pit will either evaporate or become direct recharge to the groundwater table. The average annual surplus under fully flooded conditions is approximately 1,121,000 m^3, 1,850,000 m^3 during a wet year (1983) and 640,000 m^3 during a dry year (1991).

3.4.5 Luce Pit

Under Existing Conditions, the areas within the Luce Pit footprint consist of developed mine area and water bodies (ponds), having a total area of approximately 255 ha, with an average annual surplus of approximately 1,186,000 m^3/year. The annual surplus during a wet year (1983) is approximately 1,633,000 m^3 and 872,000 m^3 during a dry year (1991). Runoff accounts for 100% of the total surplus within the Luce Pit, which flows to the existing ponds within the pit area. The monthly and annual surpluses are presented in Tables 18, 19 and 20 (attached to this report) for the average, wet and dry years, respectively.

Under Phases 1 and 3 of the Wabush 3 Mine Development, the catchment area to Luce Pit will include approximately 37 ha of waste rock stockpile. This will result in a decrease of total surplus within the Luce Pit catchment area of approximately 0.1% (average annual conditions) which equates to a total surplus of approximately 1,184,000 m^3 during an average year, 1,633,000 m^3 during a wet year (1983) and 869,000 m^3 during a dry year (1991).

The Post-Closure scenario assumes that the waste rock pile will be vegetated. A WHC for the waste rock area of 100 mm was chosen due to vegetation of the ground surface compared to 50 mm WHC used when this area is bare rock. The total surplus within the Luce Pit catchment area will decrease by approximately 0.7% compared to existing conditions due to the increase in vegetation. This will result in a total surplus of approximately 1,177,000 m^3 during an average year, 1,632,000 m^3 during a wet year (1983) and 858,000 m^3 during a dry year (1991).

During Phase 1 and Phase 3 of mine development, surplus from the waste rock stockpile accounts for approximately 14% of the total surplus within the Luce Pit footprint. Water quality impact from the waste rock stockpile would therefore experience dilution before ultimately draining to the Luce Pit ponds. However, a geochemical analysis of the waste rock water quality has not been completed.

4.0 HYDROLOGICAL MODELLING

A hydrological model was developed using SWMM 5 to assess flood flows within the Dumbell and Leg Lake watersheds, as well as flood flows to the Wabush 3 Pit. 24 hour duration design storms were created using the Chicago distribution for return periods of 2, 5, 10, 25, 50 and 100 year events using Intensity-Duration-Frequency (IDF) values derived for the rainfall data taken from the Wabush Airport Station (1974 to 2003).

The Dumbell and Leg Lake watersheds were divided into subcatchments as shown on Figure 2. Curve numbers for the subcatchments were estimated based on land use being forested (CN = 73), waste and overburden

stockpiles (CN = 60), residential (CN = 92) and open pits (CN = 92) (M. Wanielista, 1997). Four scenarios were included in the hydrologic modelling, including Existing Conditions, Phase 1 Mine Development, Phase 3 Mine Development and Post-Closure. Detailed results of hydrological modelling are presented in Appendix B. The total and peak runoffs within the Wabush 3 Pit are summarized in Table 21 for the 2 to 100-year return period storms.

Table 21: Peak Flow and Runoff Volumes to Wabush 3

	Rainfall (mm)	Phase 1 Mine Development		Phase 3 Mine Development	
		Total Runoff (m^3)	Peak Runoff (L/s)	Total Runoff (m^3)	Peak Runoff (L/s)
2-year	34.3	25,600	670	30,300	750
5-year	43.1	38,500	1,140	46,600	1,250
10-year	48.9	48,400	1,490	59,120	1,630
25-year	56.2	62,400	2,070	77,300	2,250
50-year	61.6	69,900	2,350	87,100	2,570
100-year	67.0	80,500	3,020	101,100	3,260

During Phase 1, Phase 3 and Post-Closure conditions, the drainage areas for the Dumbell Lake, Drum Lake, Pumphouse Pond and Leg Lake subcatchments were reduced. As a result, peak flows and runoffs from those subcatchments were also reduced from Existing Conditions. The peak flow rates and runoff volumes produced under the 2 to 100-year storms within each subcatchment are presented in Table B.1 of Appendix B.

Bathymetry data were available for Dumbell Lake, Pumphouse Lake, Drum Lake and Leg Lake, and were incorporated into the hydrological model. Modelling results indicate that inflows to Harrie Lake from the Leg Lake regional watershed will not experience increases during Wabush 3 development, rather, peak flood flows and runoff volumes will decrease, as shown in Table 22. Bathymetry and water level data were not available for Harrie Lake; however, based on the modelling results, increases to the water level within Harrie Lake are not anticipated as a result of mine development. The stage storage curves are provided in Appendix C.

Table 22: Peak Flow and Runoff Volumes to Harrie Lake

	Rainfall (mm)	Existing Conditions		Phase 1 Mine Development		Phase 3 Mine Development	
		Total Runoff (m^3)	Peak Runoff (L/s)	Total Runoff (m^3)	Peak Runoff (L/s)	Total Runoff (m^3)	Peak Runoff (L/s)
2-year	34.3	91,300	1,210	86,400	1,190	82,000	1,170
5-year	43.1	148,000	2,240	139,000	2,210	132,000	2,180
10-year	48.9	195,000	3,110	183,000	3,070	172,000	3,030
25-year	56.2	264,000	4,640	247,000	4,590	233,000	4,530
50-year	61.6	303,000	5,450	283,000	5,400	266,000	5,320
100-year	67.0	357,000	7,320	333,000	7,250	313,000	7,170

5.0 WATER QUALITY

Water quality results obtained during the hydrogeological and hydrological investigation conducted by Golder in 2011 were reviewed to assist in assessing the potential water management strategies. The 2011 water quality tables are provided in Appendix D.

Groundwater Quality

Groundwater quality was obtained from five on-site monitoring well nests during the Golder 2011 field campaign. Four of the wells were located within the Dumbell Lake watershed and one well was located within the Leg Lake watershed. Groundwater quality was obtained from one on-site well (TW-13-01) during a pumping test conducted by Amec in October 2013. The water quality results were compared to the Canadian Environmental Quality Guidelines for the Protection of Aquatic Life, Canadian Council of Ministers of the Environment (CCME) and to the Maximum Authorized Concentrations described in Schedule 4 of the Metal Mining Effluent Regulations (MMER). The metal concentrations obtained by Golder in 2011 were filtered and therefore the results provided are for the dissolved fraction of the parameter. The MMER criteria pertain to total metals.

Dumbell Lake Watershed

Groundwater quality was obtained from four well nests (W3-11-53, W3-11-49, W3-11-76 and W3-11-71) within the Dumbell Lake watershed during the Golder 2011 field campaign. Within the water quality results at wells W3-11-53 (deep, middle), W3-11-76 (deep) and W3-11-49 (deep, middle, shallow), dissolved zinc exceeded the CCME guideline (30 ug/L), ranging from 31.3 to 63.7 ug/L. Water quality results obtained at W3-11-49 (shallow) showed dissolved aluminum (223 ug/L) above the CCME guideline (100 ug/L), and dissolved iron (432 ug/L) above the CCME guideline (300 ug/L). The CCME guidelines for dissolved copper (2 to 4 ug/L) and silver (0.1 ug/L) was exceeded at W3-11-49 shallow (5.5 ug/L for copper, 0.46 ug/L for silver) and middle (8.4 ug/L for copper, 0.21 ug/L for silver). Water quality results obtained at W3-11-49 (shallow, middle, deep) and W3-11-53 (middle) for dissolved chromium were above the CCME guideline (1 ug/L) and ranged from 1.2 to 3.4 ug/L.

Concentrations of total suspended solids were above the MMER (30 mg/L) in wells W3-11-53 (middle) and W3-11-49 (shallow, middle, deep) and ranged from 43 to 240 mg/L. No other parameters were above the MMER.

Eight groundwater quality samples were obtained from well TW-13-01 by Amec during a pumping test in October 2013. Total and Dissolved metals analysis was completed. The CCME guideline for chromium VI is 1 ug/L, one of the samples (TW-13-01E) had a concentration of 2.6 ug/L. No other parameters were above the CCME guidelines and none of the samples had concentrations above the MMER.

Leg Lake Watershed

Groundwater quality was obtained from deep well W3-11-40 during the Golder 2011 field campaign. Dissolved aluminum (141 ug/L) and dissolved zinc (33.5 ug/L) were above the CCME guidelines. Dissolved chromium was

not detected in the sample. The total suspended solids concentration at W3-11-40 (deep well) was 260 mg/L which is above the MMER (30 mg/L).

Surface Water Quality

A broad suite of parameters was analysed at SW2 (Dumbell Lake watershed) and SW7 (Leg Lake watershed) during the September 16, 2011 field campaign.

Dumbell Lake (SW2)

A review of the analysed water quality parameters at SW2, located within the Dumbell Lake watershed area, showed that all results were below the CCME Guideline for Protection of Aquatic Life.

Leg Lake (SW7)

A review of the analysed water quality parameters at SW7, located upstream of Leg Lake, showed that Total aluminum, total chromium and total iron exceeded the CCME Guidelines. Total aluminum (107 ug/L) was above the CCME guideline of 100 ug/L and total iron slightly exceeded the CCME guideline (300 ug/L) with a concentration of 322 ug/L. The limit for hexavalent chromium is 1.0 µg/L and 8.9 µg/L for trivalent chromium. The total chromium concentration was 6.6 ug/L.

Groundwater and Surface Water Quality Comparison

A comparison between groundwater and surface water quality was completed as part of the Golder 2011 report. The report concluded that there was a significant groundwater inflow to SW7 as evident by elevated concentrations of iron, aluminum, titanium and chromium which can be attributed to groundwater flow through iron formations.

Dumbell Lake water quality did not show high levels of iron, aluminum, titanium or chromium.

6.0 WATER MANAGEMENT PLAN

Development of Wabush 3 will result in increased groundwater flow towards the pit area. The groundwater inflow to the Wabush 3 Pit was estimated to be approximately 28 L/s (450 igpm) (Rio Tinto 2014) during Phase 1 Mine Development, and approximately 32 L/s (500 igpm) during Phase 3 Mine Development (Rio Tinto 2014). Increased groundwater flow towards Wabush 3 will be managed through dewatering wells along the east and west perimeter of the pit, with discharge from the west wells being directed into the Leg Lake watershed and discharge from the east wells directed to the Dumbell Lake watershed.

Surface water (i.e., runoff) from the existing Dumbell and Leg Lake watersheds will collect within the Wabush 3 Pit during mine development. The proposed discharge point for all surface water collected within the pit is Luce

Pit for settling and treatment. A single pond/sump located on the Wabush 3 Pit floor will collect runoff and excess groundwater inflow to the Wabush 3 Pit before pumping through a pipeline to a new settling and treatment system to be located near the Luce Pit. The location of the pond/sump within Wabush 3 is shown on Figures 8 and 9.

The discharge from the proposed settling and treatment system adjacent to Luce Pit may be merged with the treated effluent from Luce Pit and discharged from the Luce Pit Final Discharge Point (FDP) into the Luce Lake watershed. If discharges are merged, the confluence would occur downstream of the monitoring locations for both the Wabush 3 Pit discharge and the treated effluent from Luce Pit. The merging of discharges or separate FDPs will be determined during the detailed design stage.

The mine water settling and treatment system will be designed and operated to meet the federal and provincial regulatory standards for effluent quality at the FDPs to the receiving environment. The design will factor in the necessary systems to treat potential ammonia residue associated with blasting in the pit. The detailed design will occur after the EA process and will very likely be influenced by the recommendations and conditions associated with the EA release.

7.0 EFFECTS ASSESSMENT

The effects on water quality and quantity within the Dumbell Lake, Leg Lake and White Lake watersheds and Luce Pit were examined, based on the changes to hydrology due to the operation of the Wabush 3 Pit, and are discussed in the following sections.

7.1 Groundwater and Surface Water Interaction

Previous monitoring results have indicated that watercourses upstream of Dumbell Lake (SW2) and Leg Lake (SW7) receive groundwater discharge under existing conditions. Extraction of Wabush 3 will result in groundwater inflow to the pit of approximately 28 to 32 L/s (Rio Tinto 2014) which will result in baseflow reductions to Dumbell Lake and Leg Lake. Based on the Rio Tinto groundwater model, the predicted baseflow reduction to Dumbell Lake is approximately 0.13 L/s (0.2% of the low flow measured by Amec in 2012) and approximately 9 L/s reduction to Leg Lake baseflow. The predicted reduction to baseflow contributing to Dumbell Lake is minimal and will be mitigated by pumping groundwater from the eastern dewatering wells to Dumbell Lake. The reduction in flow to Leg Lake is significant; however, the proposed groundwater management plan described in Section 6.0 would mitigate this effect on Leg Lake by re-directing groundwater inflow (via perimeter wells) towards Leg Lake.

The relative increase in groundwater flow to Wabush 3 is fairly minimal from Phase 1 to Phase 3 of mine development.

7.2 Surface Water Quantity

Development of Wabush 3 will reduce the regional watershed areas, as discussed in Section 3. The reduction in surplus within the Dumbell Lake watershed is approximately 14% during Phase 1, and 15% during Phase 3 of

mine development. The reduction in runoff within the Leg Lake watershed is approximately 3% during Phase 1 and 8% during Phase 3. It is recommended that surface water discharge from Wabush 3 Pit and Luce Pit be managed within a single watershed; therefore, surface water captured within Wabush 3 will be discharged to Luce Pit and eventually to Luce Lake. Based on the results of surplus estimates described in Section 3, discharge from Wabush 3 will increase the total surplus to Luce Pit by approximately 61% (average year).

7.3 Surface Water Quality

Surface water quality within the project zone of influence may be impacted by development of a waste rock stockpile, an overburden stockpile, and discharge of groundwater to surface watercourses via perimeter wells.

The waste rock stockpile will be located partially within the White Lake and Leg Lake watersheds and Luce Pit catchment area. The overburden stockpile will be located entirely within the Leg Lake watershed, with increased areal extent from Phase 1 to Phase 3 of mine development. Increased suspended solids from the overburden and waste rock stockpiles may potentially affect surface water quality if not managed appropriately. Surplus from the waste rock stockpile accounts for approximately 11% of the total surplus within the White Lake watershed and 14% of the Luce Pit catchment area, while surplus from the waste rock and overburden stockpiles account for 5% of the total surplus within the Leg Lake watershed. Water quality impact from the stockpiles would therefore be diluted upon reaching their ultimate receivers. However, a geochemical analysis of the waste rock water quality has not been completed.

The groundwater quality comparison to the surface water quality, obtained during 2011 and described in Section 5.0, concluded that significant groundwater inflow to SW7 (Leg Lake) was evident based on elevated concentrations of certain metals, where surface water quality results at SW2 (Dumbell Lake) did not show similar characteristics to groundwater quality. Pumping at perimeter wells to the surface watercourses within the Dumbell and Leg Lake watersheds will mitigate reductions in baseflow to Dumbell Lake and Leg Lake, but could potentially affect water quality within the streams/lakes. Water quality monitoring at deep wells within the vicinity of Wabush 3 indicated levels of some metals that were slightly elevated above the levels found in surface water for pre-development conditions.

Runoff to Wabush 3 Pit will be discharged to Luce Pit as discussed in Section 6.0, where settling and treatment will take place.

8.0 CONCLUSIONS

The following summarizes the hydrological conditions expected due to development of the Wabush 3 Pit:

- Reduction in drainage area within Dumbell Lake and Leg Lake, resulting in reduced surplus in those watersheds of 14 to 15%, and 3 to 8%, respectively, for Phase 1 and 3 of mine development.
- Waste rock and overburden stockpiles within the Leg Lake and White Lake watersheds represent a small percentage of the total drainage area within those catchment areas, hence water quality impacts are expected to be diluted. However, a geochemical analysis of the waste rock water quality and the potential for acid generation has not been completed.

- Potential reduction in baseflow of streams within Leg Lake and Dumbell Lake, adjacent to Wabush 3, can be partially mitigated by dewatering groundwater, using perimeter wells, to watercourses upstream of Leg Lake and Dumbell Lake.

9.0 REFERENCES

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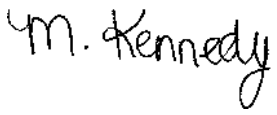

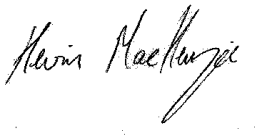

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TABLES

Table 3 - Dumbell Lake Watershed
Water Balance Summary - Average Year

Month	Temperature	Precipitation	Potential Evapotranspiration	*Existing Conditions* Total Surplus (Runoff + Infiltration)		*Phase 1* Total Surplus (Runoff + Infiltration)		*Phase 3* Total Surplus (Runoff + Infiltration)		*Post-Closure* Total Surplus (Runoff + Infiltration)	
				m^3	m^3/day	m^3	m^3/day	m^3	m^3/day	m^3	m^3/day
January	-22.0	56	0	67,585	2,180	66,521	2,146	66,460	2,144	66,460	2,144
February	-20.4	43	0	62,059	2,216	59,512	2,125	59,339	2,119	59,339	2,119
March	-13.5	56	1	131,191	4,232	119,592	3,858	118,769	3,831	118,769	3,831
April	-4.6	53	6	586,020	19,534	499,033	16,634	492,759	16,425	492,759	16,425
May	3.5	57	42	1,620,083	52,261	1,359,438	43,853	1,340,604	43,245	1,340,604	43,245
June	10.3	86	93	212,458	7,082	176,658	5,889	174,069	5,802	174,069	5,802
July	13.7	112	118	54,268	1,751	44,413	1,433	43,699	1,410	43,699	1,410
August	12.4	103	99	58,474	1,886	49,830	1,607	49,207	1,587	49,207	1,587
September	7.1	94	54	208,569	6,952	181,741	6,058	179,813	5,994	179,813	5,994
October	0.1	79	14	357,080	11,519	310,502	10,016	307,154	9,908	307,154	9,908
November	-7.8	75	1	254,647	8,488	226,247	7,542	224,215	7,474	224,215	7,474
December	-17.7	64	0	83,284	2,687	80,995	2,613	80,848	2,608	80,848	2,608
			Total/Average:	3,695,718	10,066	3,174,483	8,648	3,136,936	8,546	3,136,936	8,546
			Percent Reduction (%)	--		14%		15%		15%	

Notes:
1. All values are monthly totals averaged over the entire period of record
2. Period of record for temperature, precipitation and potential evapotranspiration; Wabush Lake Airport, NL 1961-2012 (Climate ID 8504175)
3. Detailed water balances provided in Appendix A

Table 4 - Dumbell Lake Watershed
Water Balance Summary - Wet Year (1983)

Month	Temperature	Precipitation	Potential Evapotranspiration	*Existing Conditions* Total Surplus (Runoff + Infiltration)		*Phase 1* Total Surplus (Runoff + Infiltration)		*Phase 3* Total Surplus (Runoff + Infiltration)		*Post-Closure* Total Surplus (Runoff + Infiltration)	
				m^3	m^3/day	m^3	m^3/day	m^3	m^3/day	m^3	m^3/day
January	-21.6	91	0	99,326	3,204	99,326	3,204	99,352	3,205	99,352	3,205
February	-21.1	60	0	65,094	2,325	65,094	2,325	65,111	2,325	65,111	2,325
March	-12.9	116	0	126,955	4,095	126,722	4,088	126,737	4,088	126,737	4,088
April	-1.4	102	20	2,138,302	71,277	1,805,293	60,176	1,781,247	59,375	1,781,247	59,375
May	3.1	42	41	1,265,007	40,807	1,059,682	34,183	1,044,842	33,705	1,044,842	33,705
June	12.1	96	105	-9,780	-326	-9,780	-326	-9,783	-326	-9,783	-326
July	12.8	156	112	295,572	9,535	255,232	8,233	252,329	8,140	252,329	8,140
August	11.8	93	95	-2,934	-95	-2,934	-95	-2,935	-95	-2,935	-95
September	8.0	124	60	514,046	17,135	441,902	14,730	436,705	14,557	436,705	14,557
October	0.2	85	12	563,804	18,187	485,112	15,649	479,445	15,466	479,445	15,466
November	-8.7	125	0	175,926	5,864	169,378	5,646	168,940	5,631	168,940	5,631
December	-20.6	97	0	105,194	3,393	105,194	3,393	105,222	3,394	105,222	3,394
			Total/Average:	5,336,513	14,617	4,600,221	12,601	4,547,212	12,455	4,547,212	12,455
			Percent Reduction (%)	--		14%		15%		15%	

Notes:
1. All values are monthly totals averaged over the entire period of record
2. Period of record for temperature, precipitation and potential evapotranspiration; Wabush Lake Airport, NL 1961-2012 (Climate ID 8504175)
3. Detailed water balances provided in Appendix A

Table 5 - Dumbell Lake Watershed
Water Balance Summary - Dry Year (1991)

Month	Temperature	Precipitation	Potential Evapotranspiration	*Existing Conditions* Total Surplus (Runoff + Infiltration)		*Phase 1* Total Surplus (Runoff + Infiltration)		*Phase 3* Total Surplus (Runoff + Infiltration)		*Post-Closure* Total Surplus (Runoff + Infiltration)	
				m^3	m^3/day	m^3	m^3/day	m^3	m^3/day	m^3	m^3/day
January	-28.4	19	0	20,974	677	20,974	677	20,979	677	20,979	677
February	-21.0	35	0	38,144	1,362	38,144	1,362	38,154	1,363	38,154	1,363
March	-10.7	42	0	104,115	3,359	94,527	3,049	93,846	3,027	93,846	3,027
April	-5.8	31	2	201,543	6,718	173,831	5,794	171,836	5,728	171,836	5,728
May	2.9	30	38	1,569,522	50,630	1,313,100	42,358	1,294,565	41,760	1,294,565	41,760
June	9.5	58	89	-34,232	-1,141	-34,232	-1,141	-34,241	-1,141	-34,241	-1,141
July	13.7	76	117	-44,664	-1,441	-44,664	-1,441	-44,676	-1,441	-44,676	-1,441
August	13.3	93	104	-11,737	-379	-11,737	-379	-11,740	-379	-11,740	-379
September	6.5	62	51	11,954	398	11,954	398	11,957	399	11,957	399
October	0.6	128	16	419,999	13,548	371,591	11,987	368,123	11,875	368,123	11,875
November	-6.9	67	2	155,889	5,196	142,091	4,736	141,112	4,704	141,112	4,704
December	-21.2	35	0	37,709	1,216	37,709	1,216	37,719	1,217	37,719	1,217
			Total/Average:	2,469,215	6,679	2,113,288	5,718	2,087,635	5,649	2,087,635	5,649
			Percent Reduction (%)	--		14%		15%		15%	

Notes:
1. All values are monthly totals averaged over the entire period of record
2. Period of record for temperature, precipitation and potential evapotranspiration; Wabush Lake Airport, NL 1961-2012 (Climate ID 8504175)
3. Detailed water balances provided in Appendix A

Table 6 - Leg Lake Watershed
Water Balance Summary - Average Year

Month	Temperature	Precipitation	Potential Evapotranspiration	*Existing Conditions* Total Surplus (Runoff + Infiltration)		*Phase 1* Total Surplus (Runoff + Infiltration)		*Phase 3* Total Surplus (Runoff + Infiltration)		*Post-Closure* Total Surplus (Runoff + Infiltration)	
				m^3	m^3/day	m^3	m^3/day	m^3	m^3/day	m^3	m^3/day
January	-22.0	56	0	80,868	2,609	80,480	2,596	74,304	2,397	74,253	2,395
February	-20.4	43	0	83,474	2,981	82,545	2,948	76,778	2,742	76,510	2,733
March	-13.5	56	1	212,960	6,870	209,031	6,743	196,473	6,338	196,601	6,342
April	-4.6	53	6	1,157,539	38,585	1,126,712	37,557	1,068,466	35,616	1,064,846	35,495
May	3.5	57	42	3,318,181	107,038	3,224,289	104,009	3,061,997	98,774	3,062,650	98,795
June	10.3	86	93	444,641	14,821	430,274	14,342	408,846	13,628	412,275	13,743
July	13.7	112	118	117,933	3,804	114,493	3,693	108,992	3,516	108,994	3,516
August	12.4	103	99	115,948	3,740	113,287	3,654	107,491	3,467	105,826	3,414
September	7.1	94	54	388,894	12,963	382,040	12,735	361,645	12,055	358,944	11,965
October	0.1	79	14	668,471	21,564	656,276	21,170	621,312	20,042	615,855	19,866
November	-7.8	75	1	447,897	14,930	439,176	14,639	414,476	13,816	410,780	13,693
December	-17.7	64	0	105,435	3,401	104,723	3,378	97,056	3,131	95,743	3,088
			Total/Average:	7,142,240	19,442	6,963,327	18,955	6,597,834	17,960	6,583,277	17,920
			Percent Reduction (%)	--		3%		8%		8%	

Notes:
1. All values are monthly totals averaged over the entire period of record
2. Period of record for temperature, precipitation and potential evapotranspiration; Wabush Lake Airport, NL 1961-2012 (Climate ID 8504175)
3. Detailed water balances provided in Appendix A

Table 7 - Leg Lake Watershed
Water Balance Summary - Wet Year (1983)

Month	Temperature	Precipitation	Potential Evapotranspiration	*Existing Conditions* Total Surplus (Runoff + Infiltration)		*Phase 1* Total Surplus (Runoff + Infiltration)		*Phase 3* Total Surplus (Runoff + Infiltration)		*Post-Closure* Total Surplus (Runoff + Infiltration)	
				m^3	m^3/day	m^3	m^3/day	m^3	m^3/day	m^3	m^3/day
January	-21.6	91	0	109,677	3,538	109,677	3,538	100,695	3,248	101,360	3,270
February	-21.1	60	0	71,878	2,567	0	0	65,992	2,357	67,440	2,409
March	-12.9	116	0	141,558	4,566	2,876	93	129,978	4,193	138,073	4,454
April	-1.4	102	20	4,314,933	143,831	4,095,886	136,530	3,980,104	132,670	3,811,462	127,049
May	3.1	42	41	2,601,492	83,919	2,525,548	81,469	2,400,015	77,420	2,438,873	78,673
June	12.1	96	105	-10,800	-360	0	0	-9,915	-331	16,280	543
July	12.8	156	112	563,496	18,177	497,355	16,044	520,400	16,787	499,231	16,104
August	11.8	93	95	-3,240	-105	0	0	-2,975	-96	1,691	55
September	8.0	124	60	990,892	33,030	888,000	29,600	914,435	30,481	883,511	29,450
October	0.2	85	12	1,084,253	34,976	967,924	31,223	999,881	32,254	977,646	31,537
November	-8.7	125	0	232,677	7,756	80,534	2,684	213,983	7,133	226,697	7,557
December	-20.6	97	0	116,157	3,747	0	0	106,644	3,440	107,000	3,452
			Total/Average:	10,212,973	27,970	9,167,800	25,098	9,419,237	25,796	9,269,263	25,379
			Percent Reduction (%)	--		10%		8%		9%	

Notes:

1. All values are monthly totals averaged over the entire period of record
2. Period of record for temperature, precipitation and potential evapotranspiration; Wabush Lake Airport, NL 1961-2012 (Climate ID 8504175)
3. Detailed water balances provided in Appendix A

Table 8 - Leg Lake Watershed
Water Balance Summary - Dry Year (1991)

Month	Temperature	Precipitation	Potential Evapotranspiration	*Existing Conditions* Total Surplus (Runoff + Infiltration)		*Phase 1* Total Surplus (Runoff + Infiltration)		*Phase 3* Total Surplus (Runoff + Infiltration)		*Post-Closure* Total Surplus (Runoff + Infiltration)	
				m^3	m^3/day	m^3	m^3/day	m^3	m^3/day	m^3	m^3/day
January	-28.4	19	0	23,159	747	23,159	747	21,263	686	21,263	686
February	-21.0	35	0	42,119	1,504	42,119	1,504	38,670	1,381	38,670	1,381
March	-10.7	42	0	171,219	5,523	167,724	5,410	157,726	5,088	157,726	5,088
April	-5.8	31	2	385,133	12,838	375,031	12,501	355,123	11,837	355,123	11,837
May	2.9	30	38	3,237,534	104,437	3,144,282	101,428	2,986,789	96,348	2,986,789	96,348
June	9.5	58	89	-37,799	-1,260	-37,799	-1,260	-34,703	-1,157	-34,703	-1,157
July	13.7	76	117	-49,319	-1,591	-49,319	-1,591	-45,280	-1,461	-45,280	-1,461
August	13.3	93	104	-12,960	-418	-12,960	-418	-11,898	-384	-11,898	-384
September	6.5	62	51	13,792	460	13,792	460	12,711	424	12,711	424
October	0.6	128	16	753,028	24,291	760,190	24,522	720,067	23,228	720,067	23,228
November	-6.9	67	2	253,085	8,436	248,055	8,268	233,120	7,771	233,120	7,771
December	-21.2	35	0	41,639	1,343	41,639	1,343	38,229	1,233	38,229	1,233
			Total/Average:	4,820,630	13,026	4,715,912	12,743	4,471,816	12,083	4,471,816	12,083
			Percent Reduction (%)	--		2%		7%		7%	

Notes:
1. All values are monthly totals averaged over the entire period of record
2. Period of record for temperature, precipitation and potential evapotranspiration; Wabush Lake Airport, NL 1961-2012 (Climate ID 8504175)
3. Detailed water balances provided in Appendix A

Table 9 - Leg Lake Catchment
Water Balance Summary - Average Year

Month	Temperature	Precipitation	Potential Evapotranspiration	*Existing Conditions* Total Surplus (Runoff + Infiltration)		*Phase 1* Total Surplus (Runoff + Infiltration)		*Phase 3* Total Surplus (Runoff + Infiltration)		*Post-Closure* Total Surplus (Runoff + Infiltration)	
				m^3	m^3/day	m^3	m^3/day	m^3	m^3/day	m^3	m^3/day
January	-22.0	56	0	50,884	1,641	50,137	1,617	43,550	1,405	43,530	1,404
February	-20.4	43	0	47,175	1,685	45,820	1,636	39,890	1,425	39,789	1,421
March	-13.5	56	1	101,508	3,274	96,120	3,101	84,053	2,711	84,101	2,713
April	-4.6	53	6	463,529	15,451	424,324	14,144	373,067	12,436	371,701	12,390
May	3.5	57	42	1,287,239	41,524	1,169,765	37,734	1,029,581	33,212	1,029,828	33,220
June	10.3	86	93	169,274	5,642	152,609	5,087	134,348	4,478	135,642	4,521
July	13.7	112	118	43,442	1,401	39,073	1,260	34,462	1,112	34,463	1,112
August	12.4	103	99	46,241	1,492	42,501	1,371	37,384	1,206	36,755	1,186
September	7.1	94	54	163,788	5,460	152,610	5,087	134,056	4,469	133,036	4,435
October	0.1	79	14	280,598	9,052	261,097	8,422	229,380	7,399	227,320	7,333
November	-7.8	75	1	198,722	6,624	186,170	6,206	163,189	5,440	161,793	5,393
December	-17.7	64	0	62,985	2,032	61,695	1,990	53,652	1,731	53,156	1,715
			Total/Average:	2,915,384	7,940	2,681,923	7,305	2,356,613	6,419	2,351,116	6,404
			Percent Reduction (%)	--		8%		19%		19%	

Notes:
1. All values are monthly totals averaged over the entire period of record
2. Period of record for temperature, precipitation and potential evapotranspiration; Wabush Lake Airport, NL 1961-2012 (Climate ID 8504175)
3. Detailed water balances provided in Appendix A

Table 10 - Leg Lake Catchment
Water Balance Summary - Wet Year (1983)

Month	Temperature	Precipitation	Potential Evapotranspiration	*Existing Conditions* Total Surplus (Runoff + Infiltration)		*Phase 1* Total Surplus (Runoff + Infiltration)		*Phase 3* Total Surplus (Runoff + Infiltration)		*Post-Closure* Total Surplus (Runoff + Infiltration)	
				m^3	m^3/day	m^3	m^3/day	m^3	m^3/day	m^3	m^3/day
January	-21.6	91	0	74,333	2,398	73,900	2,384	64,101	2,068	64,372	2,077
February	-21.1	60	0	48,715	1,740	48,431	1,730	42,010	1,500	42,658	1,523
March	-12.9	116	0	95,077	3,067	94,424	3,046	81,918	2,643	85,007	2,742
April	-1.4	102	20	1,695,831	56,528	1,544,941	51,498	1,359,087	45,303	1,296,782	43,226
May	3.1	42	41	1,005,631	32,440	912,882	29,448	803,558	25,921	817,711	26,378
June	12.1	96	105	-7,319	-244	-7,277	-243	-6,312	-210	2,797	93
July	12.8	156	112	232,777	7,509	214,629	6,924	188,511	6,081	181,203	5,845
August	11.8	93	95	-2,196	-71	-2,183	-70	-1,894	-61	2,991	96
September	8.0	124	60	405,405	13,514	372,749	12,425	327,475	10,916	320,445	10,682
October	0.2	85	12	444,522	14,339	408,627	13,182	358,937	11,579	354,372	11,431
November	-8.7	125	0	133,537	4,451	129,986	4,333	113,124	3,771	119,038	3,968
December	-20.6	97	0	78,724	2,539	78,266	2,525	67,889	2,190	68,638	2,214
			Total/Average:	4,205,037	11,517	3,869,375	10,598	3,398,404	9,308	3,356,012	9,190
			Percent Reduction (%)	--		8%		19%		20%	

Notes:
1. All values are monthly totals averaged over the entire period of record
2. Period of record for temperature, precipitation and potential evapotranspiration; Wabush Lake Airport, NL 1961-2012 (Climate ID 8504175)
3. Detailed water balances provided in Appendix A

Table 11 - Leg Lake Catchment
Water Balance Summary - Dry Year (1991)

Month	Temperature	Precipitation	Potential Evapotranspiration	*Existing Conditions* Total Surplus (Runoff + Infiltration)		*Phase 1* Total Surplus (Runoff + Infiltration)		*Phase 3* Total Surplus (Runoff + Infiltration)		*Post-Closure* Total Surplus (Runoff + Infiltration)	
				m^3	m^3/day	m^3	m^3/day	m^3	m^3/day	m^3	m^3/day
January	-28.4	19	0	15,696	506	15,605	503	13,536	437	13,806	445
February	-21.0	35	0	28,546	1,019	28,379	1,014	24,617	879	25,265	902
March	-10.7	42	0	80,669	2,602	76,137	2,456	66,589	2,148	67,298	2,171
April	-5.8	31	2	158,783	5,293	146,119	4,871	128,325	4,277	143,756	4,792
May	2.9	30	38	1,248,189	40,264	1,132,381	36,528	996,866	32,157	998,018	32,194
June	9.5	58	89	-25,618	-854	-25,469	-849	-22,092	-736	-12,983	-433
July	13.7	76	117	-33,425	-1,078	-33,231	-1,072	-28,825	-930	-25,572	-825
August	13.3	93	104	-8,783	-283	-8,732	-282	-7,574	-244	-2,690	-87
September	6.5	62	51	8,946	298	8,894	296	7,715	257	19,309	644
October	0.6	128	16	328,210	10,587	315,460	10,176	277,674	8,957	271,176	8,748
November	-6.9	67	2	120,623	4,021	114,075	3,803	99,737	3,325	103,805	3,460
December	-21.2	35	0	28,220	910	28,056	905	24,336	785	25,086	809
			Total/Average:	1,950,055	5,274	1,797,674	4,862	1,580,903	4,276	1,626,273	4,402
			Percent Reduction (%)	--		8%		19%		17%	

Notes:
1. All values are monthly totals averaged over the entire period of record
2. Period of record for temperature, precipitation and potential evapotranspiration; Wabush Lake Airport, NL 1961-2012 (Climate ID 8504175)
3. Detailed water balances provided in Appendix A

Table 12 - White Lake Watershed
Water Balance Summary - Average Year

Month	Temperature	Precipitation	Potential Evapotranspiration	*Existing Conditions* Total Surplus (Runoff + Infiltration)		*Phase 1* Total Surplus (Runoff + Infiltration)		*Phase 3* Total Surplus (Runoff + Infiltration)		*Post-Closure* Total Surplus (Runoff + Infiltration)	
				m^3	m^3/day	m^3	m^3/day	m^3	m^3/day	m^3	m^3/day
January	-22.0	56	0	46,141	1,488	46,141	1,488	46,141	1,488	46,118	1,488
February	-20.4	43	0	38,861	1,388	38,861	1,388	38,861	1,388	38,741	1,384
March	-13.5	56	1	68,282	2,203	68,420	2,207	68,420	2,207	68,478	2,209
April	-4.6	53	6	226,477	7,549	226,886	7,563	226,886	7,563	225,263	7,509
May	3.5	57	42	581,092	18,745	581,615	18,762	581,615	18,762	581,907	18,771
June	10.3	86	93	72,590	2,420	71,982	2,399	71,982	2,399	73,519	2,451
July	13.7	112	118	16,954	547	17,025	549	17,025	549	17,026	549
August	12.4	103	99	22,679	732	22,906	739	22,906	739	22,159	715
September	7.1	94	54	89,828	2,994	91,183	3,039	91,183	3,039	89,972	2,999
October	0.1	79	14	152,345	4,914	154,560	4,986	154,560	4,986	152,114	4,907
November	-7.8	75	1	119,395	3,980	120,151	4,005	120,151	4,005	118,494	3,950
December	-17.7	64	0	54,675	1,764	54,731	1,766	54,731	1,766	54,142	1,747
			Total/Average:	1,489,318	4,060	1,494,459	4,074	1,494,459	4,074	1,487,932	4,056
			Percent Reduction (%)	--		-0.3%		-0.3%		0.1%	

Notes:
1. All values are monthly totals averaged over the entire period of record
2. Period of record for temperature, precipitation and potential evapotranspiration; Wabush Lake Airport, NL 1961-2012 (Climate ID 8504175)
3. Detailed water balances provided in Appendix A

Table 13 - White Lake Watershed
Water Balance Summary - Wet Year (1983)

Month	Temperature	Precipitation	Potential Evapotranspiration	*Existing Conditions* Total Surplus (Runoff + Infiltration)		*Phase 1* Total Surplus (Runoff + Infiltration)		*Phase 3* Total Surplus (Runoff + Infiltration)		*Post-Closure* Total Surplus (Runoff + Infiltration)	
				m^3	m^3/day	m^3	m^3/day	m^3	m^3/day	m^3	m^3/day
January	-21.6	91	0	71,300	2,300	71,300	2,300	71,300	2,300	71,300	2,300
February	-21.1	60	0	46,727	1,669	46,727	1,669	46,727	1,669	46,727	1,669
March	-12.9	116	0	90,611	2,923	90,611	2,923	90,611	2,923	90,611	2,923
April	-1.4	102	20	791,543	26,385	791,613	26,387	791,613	26,387	791,543	26,385
May	3.1	42	41	449,702	14,507	449,808	14,510	449,808	14,510	449,702	14,507
June	12.1	96	105	-7,021	-234	-7,021	-234	-7,021	-234	-7,021	-234
July	12.8	156	112	122,118	3,939	122,471	3,951	122,471	3,951	122,118	3,939
August	11.8	93	95	-2,106	-68	-2,106	-68	-2,106	-68	-2,106	-68
September	8.0	124	60	207,947	6,932	208,264	6,942	208,264	6,942	207,947	6,932
October	0.2	85	12	229,047	7,389	229,083	7,390	229,083	7,390	229,047	7,389
November	-8.7	125	0	111,669	3,722	111,669	3,722	111,669	3,722	111,669	3,722
December	-20.6	97	0	75,513	2,436	75,513	2,436	75,513	2,436	75,513	2,436
			Total/Average:	2,187,050	5,992	2,187,933	5,994	2,187,933	5,994	2,187,050	5,992
			Percent Reduction (%)	--		0.0%		0.0%		0.0%	

Notes:
1. All values are monthly totals averaged over the entire period of record
2. Period of record for temperature, precipitation and potential evapotranspiration; Wabush Lake Airport, NL 1961-2012 (Climate ID 8504175)
3. Detailed water balances provided in Appendix A

Table 14 - White Lake Watershed
Water Balance Summary - Dry Year (1991)

Month	Temperature	Precipitation	Potential Evapotranspiration	*Existing Conditions* Total Surplus (Runoff + Infiltration)		*Phase 1* Total Surplus (Runoff + Infiltration)		*Phase 3* Total Surplus (Runoff + Infiltration)		*Post-Closure* Total Surplus (Runoff + Infiltration)	
				m^3	m^3/day	m^3	m^3/day	m^3	m^3/day	m^3	m^3/day
January	-28.4	19	0	15,056	486	15,056	486	15,056	486	15,056	486
February	-21.0	35	0	27,381	978	27,381	978	27,381	978	27,381	978
March	-10.7	42	0	53,333	1,720	53,333	1,720	53,333	1,720	53,333	1,720
April	-5.8	31	2	82,811	2,760	82,811	2,760	82,811	2,760	82,811	2,760
May	2.9	30	38	554,225	17,878	554,331	17,882	554,331	17,882	554,225	17,878
June	9.5	58	89	-24,573	-819	-24,573	-819	-24,573	-819	-24,573	-819
July	13.7	76	117	-32,062	-1,034	-32,062	-1,034	-32,062	-1,034	-32,062	-1,034
August	13.3	93	104	-8,425	-272	-8,425	-272	-8,425	-272	-8,425	-272
September	6.5	62	51	8,581	286	8,581	286	8,581	286	8,581	286
October	0.6	128	16	193,425	6,240	204,907	6,610	204,907	6,610	194,979	6,290
November	-6.9	67	2	81,101	2,703	81,101	2,703	81,101	2,703	81,101	2,703
December	-21.2	35	0	27,069	873	27,069	873	27,069	873	27,069	873
			Total/Average:	977,923	2,650	989,511	2,681	989,511	2,681	979,477	2,654
			Percent Reduction (%)	--		-1.2%		-1.2%		-0.2%	

Notes:

1. All values are monthly totals averaged over the entire period of record
2. Period of record for temperature, precipitation and potential evapotranspiration; Wabush Lake Airport, NL 1961-2012 (Climate ID 8504175)
3. Detailed water balances provided in Appendix A

Table 15 - Wabush 3 Pit
Water Balance Summary - Average Year

Month	Temperature	Precipitation	Potential Evapotranspiration	*Phase 1* Total Surplus (Runoff + Infiltration)		*Phase 3* Total Surplus (Runoff + Infiltration)		*Post-Closure* Total Surplus (Runoff + Infiltration)	
				m^3	m^3/day	m^3	m^3/day	m^3	m^3/day
January	-22.0	56	0	2,203	71	3,024	98	140,340	4,527
February	-20.4	43	0	4,027	144	5,995	214	106,633	3,808
March	-13.5	56	1	17,061	550	26,373	851	137,495	4,435
April	-4.6	53	6	120,277	4,009	188,576	6,286	116,334	3,878
May	3.5	57	42	355,408	11,465	558,180	18,006	36,249	1,169
June	10.3	86	93	45,610	1,520	71,703	2,390	-18,158	-605
July	13.7	112	118	13,570	438	21,363	689	-14,703	-474
August	12.4	103	99	14,063	454	22,053	711	12,118	391
September	7.1	94	54	46,021	1,534	71,983	2,399	99,872	3,329
October	0.1	79	14	75,838	2,446	118,627	3,827	161,832	5,220
November	-7.8	75	1	43,319	1,444	67,478	2,249	183,570	6,119
December	-17.7	64	0	4,404	142	6,424	207	159,094	5,132
			Total/Average:	741,802	2,018	1,161,778	3,161	1,120,675	3,077

Notes:

1. All values are monthly totals averaged over the entire period of record
2. Period of record for temperature, precipitation and potential evapotranspiration; Wabush Lake Airport, NL 1961-2012 (Climate ID 8504175)
3. Detailed water balances provided in Appendix A

Table 16 - Wabush 3 Pit
Water Balance Summary - Wet Year (1983)

Month	Temperature	Precipitation	Potential Evapotranspiration	*Phase 1* Total Surplus (Runoff + Infiltration)		*Phase 3* Total Surplus (Runoff + Infiltration)		*Post-Closure* Total Surplus (Runoff + Infiltration)	
				m^3	m^3/day	m^3	m^3/day	m^3	m^3/day
January	-21.6	91	0	1,243	40	1,243	40	228,372	7,367
February	-21.1	60	0	815	29	815	29	149,666	5,345
March	-12.9	116	0	1,887	61	2,068	67	288,588	9,309
April	-1.4	102	20	451,963	15,065	709,333	23,644	203,636	6,788
May	3.1	42	41	278,279	8,977	437,126	14,101	2,748	89
June	12.1	96	105	-122	-4	-122	-4	-22,487	-750
July	12.8	156	112	56,751	1,831	88,809	2,865	108,689	3,506
August	11.8	93	95	-37	-1	-37	-1	-6,746	-218
September	8.0	124	60	99,906	3,330	156,437	5,215	160,910	5,364
October	0.2	85	12	107,617	3,472	168,483	5,435	182,648	5,892
November	-8.7	125	0	10,556	352	15,613	520	311,825	10,394
December	-20.6	97	0	1,316	42	1,316	42	241,864	7,802
			Total/Average:	1,010,174	2,766	1,581,085	4,329	1,849,714	5,074

Notes:

1. All values are monthly totals averaged over the entire period of record
2. Period of record for temperature, precipitation and potential evapotranspiration; Wabush Lake Airport, NL 1961-2012 (Climate ID 8504175)
3. Detailed water balances provided in Appendix A

Table 17 - Wabush 3 Pit
Water Balance Summary - Dry Year (1991)

Month	Temperature	Precipitation	Potential Evapotranspiration	*Phase 1* Total Surplus (Runoff + Infiltration)		*Phase 3* Total Surplus (Runoff + Infiltration)		*Post-Closure* Total Surplus (Runoff + Infiltration)	
				m^3	m^3/day	m^3	m^3/day	m^3	m^3/day
January	-28.4	19	0	262	8	262	8	48,223	1,556
February	-21.0	35	0	477	17	477	17	87,701	3,132
March	-10.7	42	0	13,536	437	20,941	676	103,692	3,345
April	-5.8	31	2	37,880	1,263	59,282	1,976	71,210	2,374
May	2.9	30	38	347,285	11,203	545,596	17,600	-20,239	-653
June	9.5	58	89	-428	-14	-428	-14	-78,706	-2,624
July	13.7	76	117	-559	-18	-559	-18	-102,692	-3,313
August	13.3	93	104	-147	-5	-147	-5	-26,985	-870
September	6.5	62	51	150	5	150	5	27,485	916
October	0.6	128	16	134,252	4,331	210,019	6,775	280,593	9,051
November	-6.9	67	2	19,555	652	30,211	1,007	163,159	5,439
December	-21.2	35	0	472	15	472	15	86,701	2,797
			Total/Average:	552,736	1,491	866,276	2,337	640,141	1,762

Notes:
1. All values are monthly totals averaged over the entire period of record
2. Period of record for temperature, precipitation and potential evapotranspiration; Wabush Lake Airport, NL 1961-2012 (Climate ID 8504175)
3. Detailed water balances provided in Appendix A

Table 18 - Luce Pit
Water Balance Summary - Average Year

Month	Temperature	Precipitation	Potential Evapotranspiration	*Existing Conditions* Total Surplus (Runoff + Infiltration)		*Phase 1 / Phase 3* Total Surplus (Runoff + Infiltration)		*Post-Closure* Total Surplus (Runoff + Infiltration)	
				m^3	m^3/day	m^3	m^3/day	m^3	m^3/day
January	-22.0	56	0	11,276	364	11,276	364	11,252	363
February	-20.4	43	0	12,128	433	12,128	433	12,002	429
March	-13.5	56	1	33,591	1,084	33,591	1,084	33,651	1,086
April	-4.6	53	6	188,535	6,284	188,506	6,284	186,812	6,227
May	3.5	57	42	539,698	17,410	539,643	17,408	539,948	17,418
June	10.3	86	93	67,969	2,266	67,969	2,266	69,574	2,319
July	13.7	112	118	19,696	635	19,696	635	19,698	635
August	12.4	103	99	21,960	708	21,660	699	20,881	674
September	7.1	94	54	75,272	2,509	74,546	2,485	73,282	2,443
October	0.1	79	14	123,884	3,996	123,413	3,981	120,859	3,899
November	-7.8	75	1	75,922	2,531	75,802	2,527	74,073	2,469
December	-17.7	64	0	15,667	505	15,623	504	15,009	484
			Total/Average:	1,185,599	3,227	1,183,854	3,222	1,177,042	3,204
			Percent Reduction (%)	--		0.1%		0.7%	

Notes:
1. All values are monthly totals averaged over the entire period of record
2. Period of record for temperature, precipitation and potential evapotranspiration; Wabush Lake Airport, NL 1961-2012 (Climate ID 8504175)
3. Detailed water balances provided in Appendix A

Table 19 - Luce Pit
Water Balance Summary - Wet Year (1983)

Month	Temperature	Precipitation	Potential Evapotranspiration	*Existing Conditions* Total Surplus (Runoff + Infiltration)		*Phase 1 / Phase 3* Total Surplus (Runoff + Infiltration)		*Post-Closure* Total Surplus (Runoff + Infiltration)	
				m^3	m^3/day	m^3	m^3/day	m^3	m^3/day
January	-21.6	91	0	14,807	478	14,807	478	14,807	478
February	-21.1	60	0	9,704	347	9,704	347	9,704	347
March	-12.9	116	0	19,190	619	19,190	619	19,190	619
April	-1.4	102	20	695,237	23,175	695,237	23,175	695,163	23,172
May	3.1	42	41	421,124	13,585	421,124	13,585	421,014	13,581
June	12.1	96	105	-1,458	-49	-1,458	-49	-1,458	-49
July	12.8	156	112	92,002	2,968	92,002	2,968	91,633	2,956
August	11.8	93	95	-437	-14	-437	-14	-437	-14
September	8.0	124	60	160,241	5,341	160,241	5,341	159,909	5,330
October	0.2	85	12	173,137	5,585	173,137	5,585	173,100	5,584
November	-8.7	125	0	33,619	1,121	33,619	1,121	33,619	1,121
December	-20.6	97	0	15,682	506	15,682	506	15,682	506
			Total/Average:	1,632,846	4,472	1,632,846	4,472	1,631,925	4,469
			Percent Reduction (%)	--		0.0%		0.1%	

Notes:
1. All values are monthly totals averaged over the entire period of record
2. Period of record for temperature, precipitation and potential evapotranspiration; Wabush Lake Airport, NL 1961-2012 (Climate ID 8504175)
3. Detailed water balances provided in Appendix A

Table 20 - Luce Pit
Water Balance Summary - Dry Year (1991)

Month	Temperature	Precipitation	Potential Evapotranspiration	*Existing Conditions* Total Surplus (Runoff + Infiltration)		*Phase 1 / Phase 3* Total Surplus (Runoff + Infiltration)		*Post-Closure* Total Surplus (Runoff + Infiltration)	
				m^3	m^3/day	m^3	m^3/day	m^3	m^3/day
January	-28.4	19	0	3,127	101	3,127	101	3,127	101
February	-21.0	35	0	5,686	203	5,686	203	5,686	203
March	-10.7	42	0	26,346	850	26,346	850	26,346	850
April	-5.8	31	2	61,333	2,044	61,333	2,044	61,333	2,044
May	2.9	30	38	524,213	16,910	524,213	16,910	524,102	16,907
June	9.5	58	89	-5,103	-170	-5,103	-170	-5,103	-170
July	13.7	76	117	-6,658	-215	-6,658	-215	-6,658	-215
August	13.3	93	104	-1,750	-56	-1,750	-56	-1,750	-56
September	6.5	62	51	1,782	59	1,782	59	1,782	59
October	0.6	128	16	218,974	7,064	215,287	6,945	204,926	6,611
November	-6.9	67	2	38,817	1,294	38,817	1,294	38,817	1,294
December	-21.2	35	0	5,621	181	5,621	181	5,621	181
			Total/Average:	872,389	2,355	868,702	2,346	858,231	2,317
			Percent Reduction (%)	--		0.4%		1.6%	

Notes:

1. All values are monthly totals averaged over the entire period of record
2. Period of record for temperature, precipitation and potential evapotranspiration; Wabush Lake Airport, NL 1961-2012 (Climate ID 8504175)
3. Detailed water balances provided in Appendix A

FIGURES

624000 628000 632000 636000 640000 644000 648000 652000

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N

QUEBEC
NEWFOUNDLAND AND LABRADOR

Lac Montenon
Tab Lake
D'Aigle Bay
Julienne Peninsula
Lost Lake
Tuffy Lake
Leila Wynne Lake
Reid Lake
Lorraine Lake
Spooks Pit
Stevens Lake
Lorraine Pit
Sherwood Pond
Humphrey Main Pit
Dorothy Lake
Wabush Lake
Emma Lake
O'Brien Lake
Carol Lake
Humphrey South Pit
Luce Lake
Throne Lake
Luce Pit
White Lake
Quartzite Quarry
WASTE ROCK STOCKPILE
OPEN PIT PHASE 1
IOC Mine Tailings Area
Dumbell Lake
Moosehead Lake
OPEN PIT PHASE 3
Ski Club
Leg Lake
Albert Lake
Dispute Lake
OVERBURDEN STOCKPILE
Sunday Lake
Beverley Lake
Wabush Mountain
To Churchill Falls
500
Tanya Lake
Tup Lake
Quartzite Lake
Labrador City
Little Wabush Lake
Flora Lake
To Wabush Airport

Elevation (masl)
880
870
820
770
720
670
620
570
520

LEGEND

- Proposed Phase 1 Pit Boundary
- Propose Phase 3 Pit Boundary
- Proposed Overburden Stockpile
- Proposed Waste Rock Stockpile
- IOC Mine Tailings Area

Base Data

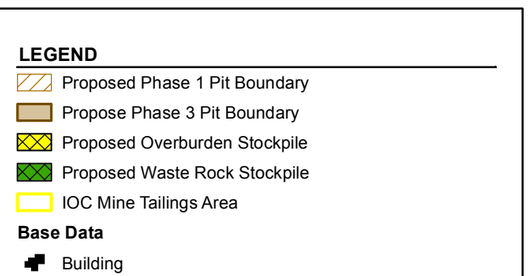
- Building
- Highway
- Site Access Road
- Other Road / Trail
- Watercourse
- Waterbody
- Wetland
- Wooded Area
- Residential Area
- Provincial Boundary

Topographic Dataset Extents

- Geomatique G.P.L Consultants, Quebec. Based on aerial photographs taken in 2004. Original scale 1:2,000
- Aero-Photo (1961) Inc, Quebec. Based on aerial photographs taken in 2011. Original scale 1:10,000
- All Other areas have topography obtained from Canvec V.8, 2011. Original scale 1:50,000

NOTES:

1. This figure is to be read in conjunction with Wabush 3 Hydrology Technical Report



REFERENCE

Base Data - Canvec V.8,2011
Elevation data derived from Canvec and files provided to Golder Associates by IOC dated 2004 and 2011.
Proposed Mine Facilities provided by IOC (Received March 2014)
Projection: Transverse Mercator Datum: NAD 27 Coordinate System: UTM Zone 19

2,500 0 2,500
SCALE 1:100,000 METRES

PROJECT
RIO TINTO – IOC
WABUSH 3 HYDROLOGY TECHNICAL REPORT
LABRADOR CITY, NL

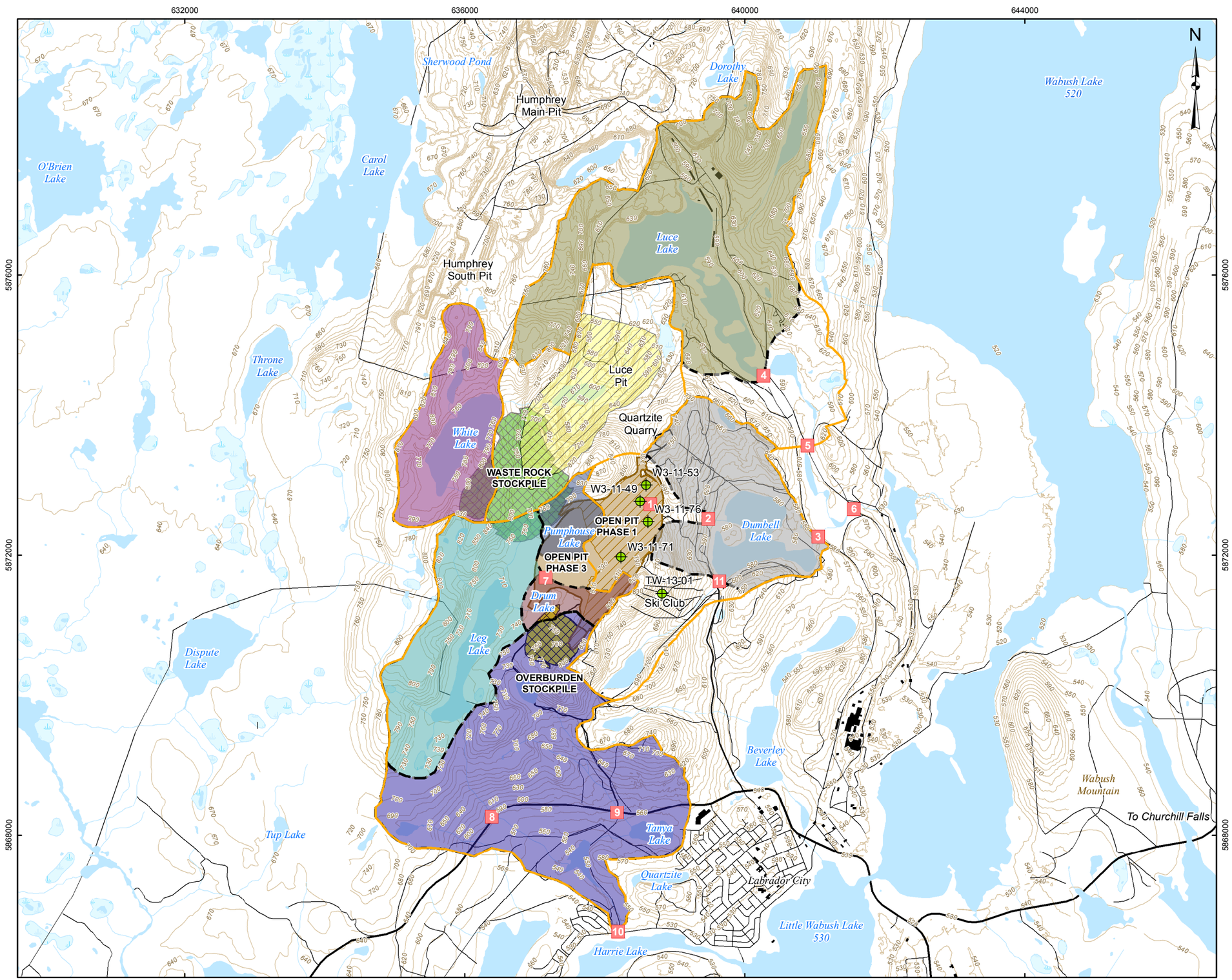
TITLE
SITE LOCATION

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1151-0293			SCALE AS SHOWN	REV. 0.0
DESIGN	SC	17 Apr. 2014		
GIS	SC	6 Jun. 2014		
CHECK	AL	6 Jun. 2014		
REVIEW	MK	6 Jun. 2014		

FIGURE: 1

G:\Projects\2011\11-1152-0116_IOC_Wabush_Nfld\GIS\MXDs\Reporting\WaterManagementPlan\SiteLocation.mxd



LEGEND

- Surface Water Monitoring Locations
- IOC Cored Boreholes
- Luce Pit
- Proposed Phase 1 Pit Boundary
- Propose Phase 3 Pit Boundary
- Proposed Overburden Stockpile
- Proposed Waste Rock Stockpile
- Regional Watershed Boundary

Subcatchment Areas

- Drum Lake
- Drumbell Lake
- Harrie Lake
- Leg Lake
- Luce Lake
- Pumphouse Lake
- White Lake

Base Data

- Building
- Contours (10m Interval)
- Watercourse
- Wetland
- Waterbody
- Provincial Boundary

NOTES:

1. This figure is to be read in conjunction with Wabush 3 Hydrology Technical Report

REFERENCE

Base Data - Canvec V.8,2011
Elevation data derived from Canvec and files provided to
Golder Associates by IOC dated 2004 and 2011.
Proposed Mine Facilities provided by IOC (Received March 2014)
Projection: Transverse Mercator Datum: NAD 27 Coordinate System: UTM Zone 19

1,500 0 1,500
SCALE 1:55,000 METRES

PROJECT
RIO TINTO – IOC
WABUSH 3 HYDROLOGY TECHNICAL REPORT
LABRADOR CITY, NL

TITLE
EXISTING WATERSHEDS AND MONITORING LOCATIONS

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1151-0293			SCALE AS SHOWN	REV. 0.0
DESIGN	SC	28 Mar. 2014		
GIS	SC	6 Jun. 2014		
CHECK	AL	6 Jun. 2014		
REVIEW	MK	6 Jun. 2014		

FIGURE: 2

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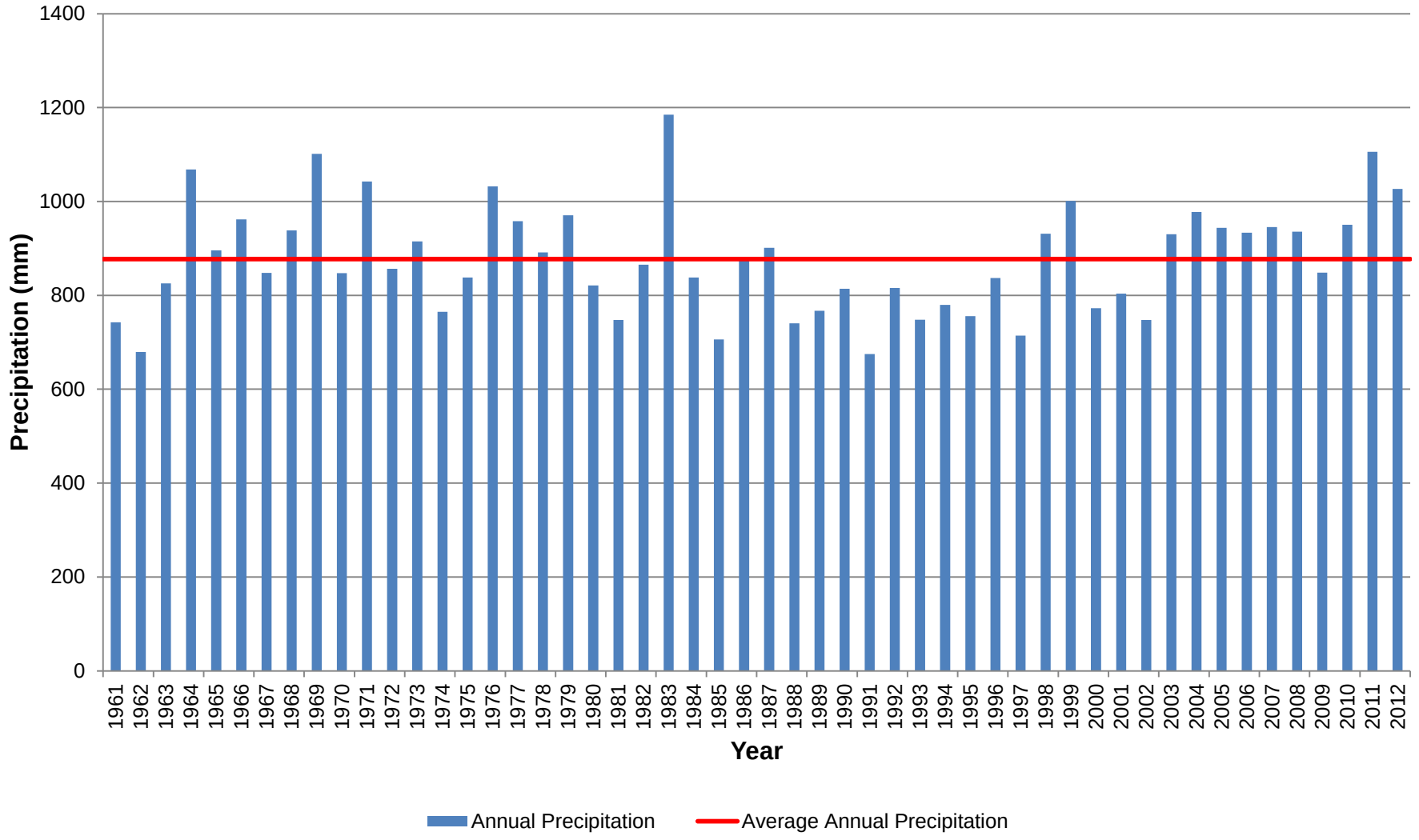
Wabush Airport Climate Station (ID 8504175) Precipitation

Figure 3



DATE: April 2014

PROJECT: 13-1151-0293

Golder Associates

prepared by: **AL**

CHK: **KMM**

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N

QUEBEC
NEWFOUNDLAND AND LABRADOR

Lac Montenon
Tab Lake
D'Aigle Bay
Julienne Peninsula
Lost Lake
Tuffy Lake
Leila Wynne Lake
Lorraine Lake
Reid Lake
Spooks Pit
Stevens Lake
Lorraine Pit
Sherwood Pond
Dorothy Lake
Humphrey Main Pit
Wabush Lake
Carol Lake
Emma Lake
O'Brien Lake
Humphrey South Pit
Luce Lake
Throne Lake
Luce Pit
White Lake
Quartzite Quarry
WASTE ROCK STOCKPILE
OPEN PIT PHASE 1
OPEN PIT PHASE 3
Dumbell Lake
IOC Mine Tailings Area
Ski Club
Moosehead Lake
Leg Lake
OVERBURDEN STOCKPILE
Dispute Lake
Albert Lake
Sunday Lake
Beverley Lake
Wabush Mountain
To Churchill Falls
500
Tanya Lake
Tup Lake
Quartzite Lake
Labrador City
Flora Lake
Little Wabush Lake
Harrie Lake
To Wabush Airport

LEGEND

Base Data

- Building
- Highway
- Site Access Road
- Other Road / Trail
- Provincial Boundary
- Proposed Phase 1 Pit Boundary
- Proposed Waste Rock Stockpile
- Propose Phase 3 Pit Boundary
- Watercourse
- Waterbody
- Wetland

Surficial Geology

Glaciofluvial Deposits

Proglacial or ice contact sand and gravel; forming ice contact fans and deltas, outwash plains and terraces, pitted outwash, crevasse fillings, kames, and kame terraces; commonly associated with eskers; includes areas of extensive, thick fluvial sediments derived from pre-existing glaciofluvial deposits

Ablation Drift

Sediments and landforms formed during the disintegration of the ice sheet; predominantly massive to poorly stratified, silty to sandy diamicton and poorly sorted to well sorted sand and gravel; characterized by irregular hummocks and mounds 5 to 10 m high and by extensive meltwater channels; on nothern Labrador Peninsula, can include glaciocustrine and glaciomarine deposits

Ribbed (Rogen) Moraine

Irregular to sinuous ridges which are generally less than 1 km long and 10 m high, or hummocks; composed of massive to poorly stratified; sandy diamicton, gravel and sandy gravel; can be mantled by large boulders. Ridges trend roughly perpendicular to ice flow; field of ribbed moraine vary in outline from irregular and blocky to elongate, lying parallel to regional ice movement; in the south ribbed moraine preferentially occurs within valleys

Drift Poor Areas

Greater than 80% bedrock; includes areas of till and other surficial materials generally <1 m thick and discontinuous; on northern Labrador Peninsula, characterized by extensive boulder fields, dominantly felsenmeer

Till and Other Surficial Deposits (Undifferentiated)

Predominantly nonstratisfied, poorly sorted, silty to diamicton, gravel, and sandy gravel; deposited either directly from ice or by meltout during ablation; includes glaciofluvial, glaciolacustrine, marine, and fluvial deposits of either minor areal extent or thin (<2 m) and discontinuous

NOTES:

1. This figure is to be read in conjunction with Wabush 3 Hydrology Technical Report

REFERENCE

Base Data - Canvec V.8,2011
Surficial Geology from Klassen, Paradis, Bolduc and Thomas, 1992.
Surficial Geology GIS data obtained from Newfoundland Labrador GeoScience Atlas, http://gis.geosurv.gov.nl.ca/. Downloaded Nov 28, 2011.
Proposed Mine Facilities Provided by IOC (Received March 2014)

Projection: Transverse Mercator Datum: NAD 27 Coordinate System: UTM Zone 19

2,500 0 2,500
SCALE 1:100,000 METRES

PROJECT
RIO TINTO – IOC
WABUSH 3 HYDROLOGY TECHNICAL REPORT
LABRADOR CITY, NL

TITLE
REGIONAL SURFICIAL GEOLOGY

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1151-0293			SCALE AS SHOWN	REV. 0.0
DESIGN	SC	17 Apr. 2014		
GIS	SC	6 Jun. 2014		
CHECK	AL	6 Jun. 2014		
REVIEW	MK	6 Jun. 2014		

FIGURE: 4

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640000

5872000

N

Luce Pit

White Lake

WASTE ROCK STOCKPILE

OPEN PIT

Pumphouse Lake

Drum Lake

Leg Lake

OVERBURDEN STOCKPILE

Dumbell Lake

LEGEND

- Proposed Phase 1 Contours
- Proposed Phase 1 Overburden Stockpile
- Proposed Phase 1 Pit Boundary
- Proposed Waste Rock Stockpile

Base Data

- Building
- Highway
- Site Access Road
- Other Road / Trail
- Contours (10m Interval)
- Watercourse
- Wetland
- Waterbody

RegionalWatersheds

- Dumbell Lake
- Leg Lake
- Luce Lake
- White Lake

NOTES:

1. This figure is to be read in conjunction with Wabush 3 Hydrology Technical Report

REFERENCE

Base Data - Canvec V.8,2011
Elevation data derived from Canvec and files provided to
Golder Associates by IOC dated 2004 and 2011.
Proposed Mine Facilities Provided by IOC (Received March 2014)
Projection: Transverse Mercator Datum: NAD 27 Coordinate System: UTM Zone 19

500 0 500

SCALE 1:20,000 METRES

PROJECT

RIO TINTO – IOC
WABUSH 3 HYDROLOGY TECHNICAL REPORT
LABRADOR CITY, NL

TITLE

PHASE 1 - MINE PIT DEVELOPMENT

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1151-0293			SCALE AS SHOWN	REV. 0.0
DESIGN	SC	28 Mar. 2014		
GIS	SC	6 Jun. 2014		
CHECK	AL	6 Jun. 2014		
REVIEW	MK	6 Jun. 2014		

FIGURE: 5

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636000

640000

5872000

N

Luce Pit

White Lake

WASTE ROCK STOCKPILE

OPEN PIT

OVERBURDEN STOCKPILE

Drum Lake

Leg Lake

Dumbell Lake

LEGEND

- Proposed Phase 3 Contours
- Proposed Phase 3 Pit Boundary
- Proposed Phase 3 Overburden Stockpile
- Proposed Waste Rock Stockpile

Base Data

- Building
- Highway
- Site Access Road
- Other Road / Trail
- Contours (10m Interval)
- Watercourse
- Wetland
- Waterbody

RegionalWatersheds

- Dumbell Lake
- Leg Lake
- Luce Lake
- White Lake

NOTES:

1. This figure is to be read in conjunction with Wabush 3 Hydrology Technical Report

REFERENCE

Base Data - Canvec V.8,2011
Elevation data derived from Canvec and files provided to
Golder Associates by IOC dated 2004 and 2011.
Proposed Mine Facilities Provided by IOC (Received March 2014)
Projection: Transverse Mercator Datum: NAD 27 Coordinate System: UTM Zone 19

500 0 500
SCALE 1:20,000 METRES

PROJECT
RIO TINTO – IOC
WABUSH 3 HYDROLOGY TECHNICAL REPORT
LABRADOR CITY, NL

TITLE
PHASE 3 - MINE PIT DEVELOPMENT

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1151-0293			SCALE AS SHOWN	REV. 0.0
DESIGN	SC	17 Apr. 2014	**FIGURE: 6**	
GIS	SC	6 Jun. 2014		
CHECK	AL	6 Jun. 2014		
REVIEW	MK	6 Jun. 2014		

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636000

640000

5872000

Luce Pit

White Lake

Leg Lake

Dumbell Lake

N

LEGEND

Base Data

- Building
- Highway
- Site Access Road
- Other Road / Trail
- Contours (10m Interval)
- Watercourse
- Wetland
- Waterbody

RegionalWatersheds

- Dumbell Lake
- Leg Lake
- Luce Lake
- White Lake

NOTES:

1. This figure is to be read in conjunction with Wabush 3 Hydrology Technical Report
2. Waste Rock and Overburden Stockpiles will be re-vegetated in the same location, during post closure.

REFERENCE

Base Data - Canvec V.8,2011
Elevation data derived from Canvec and files provided to Golder Associates by IOC dated 2004 and 2011.
Proposed Mine Facilities Provided by IOC (Received March 2014)
Projection: Transverse Mercator Datum: NAD 27 Coordinate System: UTM Zone 19

500 0 500
SCALE 1:20,000 METRES

PROJECT
RIO TINTO – IOC
WABUSH 3 HYDROLOGY TECHNICAL REPORT
LABRADOR CITY, NL

TITLE
POST CLOSURE SCENARIO WATERSHEDS

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1151-0293		SCALE AS SHOWN	REV. 0.0
DESIGN	SC	28 Mar. 2014	**FIGURE: 7**
GIS	SC	6 Jun. 2014	
CHECK	AL	6 Jun. 2014	
REVIEW	MK	6 Jun. 2014	

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636000

640000

5872000

N

Luce Pit

White Lake

WASTE ROCK STOCKPILE

OPEN PIT

POND 1

OVERBURDEN STOCKPILE

Pumphouse Lake

Drum Lake

Leg Lake

Dumbell Lake

LEGEND

- Proposed Phase 1 Contours
- Proposed Phase 1 Overburden Stockpile
- Proposed Phase 1 Pit Boundary
- Proposed Waste Rock Stockpile
- Pond Location

Base Data

- Building
- Highway
- Site Access Road
- Other Road / Trail
- Contours (10m Interval)
- Watercourse
- Wetland
- Waterbody

NOTES:

1. This figure is to be read in conjunction with Wabush 3 Hydrology Technical Report

2. Approximate demensions of Pond 1 - 50 x 220 m

REFERENCE

Base Data - Canvec V.8,2011
Elevation data derived from Canvec and files provided to
Golder Associates by IOC dated 2004 and 2011.
Proposed Mine Facilities Provided by IOC (Received March 2014)
Projection: Transverse Mercator Datum: NAD 27 Coordinate System: UTM Zone 19

500 0 500

SCALE 1:20,000 METRES

PROJECT
RIO TINTO – IOC
WABUSH 3 HYDROLOGY TECHNICAL REPORT
LABRADOR CITY, NL

TITLE
PHASE 1 - PROPOSED LOCATION OF POND 1 WITHIN WABUSH 3

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1151-0293			SCALE AS SHOWN	REV. 0.0
DESIGN	SC	28 Mar. 2014		
GIS	SC	6 Jun. 2014		
CHECK	AL	6 Jun. 2014		
REVIEW	MK	6 Jun. 2014		

FIGURE: 8

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636000

640000

5872000

N

Luce Pit

White Lake

WASTE ROCK STOCKPILE

POND 1

Drum Lake

Leg Lake

Dumbell Lake

OVERBURDEN STOCKPILE

LEGEND

- Phase 3 Contours
- Phase 3 Open Pit
- Phase 3 Overburden Stockpile
- Waste Rock Stockpile
- Pond Location

Base Data

- Building
- Highway
- Site Access Road
- Other Road / Trail
- Contours (10m Interval)
- Watercourse
- Wetland
- Waterbody

NOTES:

1. This figure is to be read in conjunction with Wabush 3 Hydrology Technical Report
2. Approximate demensions of Pond 1 - 50 x 220 m
3. Approximate demensions of Pond 2 - 45 x 125 m

REFERENCE

Base Data - Canvec V.8,2011
Elevation data derived from Canvec and files provided to
Golder Associates by IOC dated 2004 and 2011.
Mine Area Phase 3 Provided by IOC (Recieved March 2014)
Projection: Transverse Mercator Datum: NAD 27 Coordinate System: UTM Zone 19

500 0 500
SCALE 1:20,000 METRES

PROJECT
RIO TINTO – IOC
WABUSH 3 HYDROLOGY TECHNICAL REPORT
LABRADOR CITY, NL

TITLE
PHASE 3 - PROPOSED LOCATION OF POND 1 WITHIN WABUSH 3

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1151-0293			SCALE AS SHOWN	REV. 0.0
DESIGN	SC	28 Mar. 2014	FIGURE: 9	
GIS	SC	6 Jun. 2014		
CHECK	AL	6 Jun. 2014		
REVIEW	MK	6 Jun. 2014		

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APPENDIX A

Detailed Water Balance Analysis

Table A.1
Water Balance for Dumbell Lake (Average Year)

Existing Conditions

				(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	(L/min)	Total Runoff (m^3)	Average Runoff (L/s)	(L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	(L/min)
January	-22.0	56	0	0	1	6,547	0	56	61,038	**67,585**	25.2	1,514	**64,311**	24.0	1,441	**3,273**	1.2	73
February	-20.4	43	0	0	2	15,681	0	43	46,378	**62,059**	25.7	1,539	**54,219**	22.4	1,345	**7,841**	3.2	194
March	-13.5	56	1	1	10	71,390	1	55	59,801	**131,191**	49.0	2,939	**95,496**	35.7	2,139	**35,695**	13.3	800
April	-4.6	53	6	6	74	535,423	6	47	50,597	**586,020**	226.1	13,565	**318,309**	122.8	7,368	**267,711**	103.3	6,197
May	3.5	57	42	42	223	1,604,317	42	15	15,766	**1,620,083**	604.9	36,292	**817,924**	305.4	18,323	**802,159**	299.5	17,970
June	10.3	86	93	93	31	220,356	93	-7	-7,898	**212,458**	82.0	4,918	**102,280**	39.5	2,368	**110,178**	42.5	2,550
July	13.7	112	118	118	8	60,663	118	-6	-6,395	**54,268**	20.3	1,216	**23,937**	8.9	536	**30,332**	11.3	679
August	12.4	103	99	98	7	53,203	99	5	5,271	**58,474**	21.8	1,310	**31,872**	11.9	714	**26,602**	9.9	596
September	7.1	94	54	54	23	165,132	54	40	43,437	**208,569**	80.5	4,828	**126,003**	48.6	2,917	**82,566**	31.9	1,911
October	0.1	79	14	14	40	286,694	14	65	70,386	**357,080**	133.3	7,999	**213,733**	79.8	4,788	**143,347**	53.5	3,211
November	-7.8	75	1	1	24	174,807	1	73	79,840	**254,647**	98.2	5,895	**167,244**	64.5	3,871	**87,403**	33.7	2,023
December	-17.7	64	0	0	2	14,090	0	64	69,195	**83,284**	31.1	1,866	**76,240**	28.5	1,708	**7,045**	2.6	158
Total	***-3.3 (Avg)***	**877**	**429**	**429**	**446**	**3,208,302**	**429**	**449**	**487,416**	**3,695,718**	**116.5**	**6,990**	**2,091,567**	**66.0**	**3,960**	**1,604,151**	**50.5**	**3,030**

Phase 1 Mine Development

				(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	(L/min)	Total Runoff (m^3)	Average Runoff (L/s)	(L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	(L/min)
January	-22.0	56	0	0	1	5,483	0	56	61,038	**66,521**	24.8	#REF!	**63,780**	23.8	1,429	**2,742**	1.0	61
February	-20.4	43	0	0	2	13,134	0	43	46,378	**59,512**	24.6	1,476	**52,945**	21.9	1,313	**6,567**	2.7	163
March	-13.5	56	1	1	10	59,791	1	55	59,801	**119,592**	44.7	2,679	**89,697**	33.5	2,009	**29,896**	11.2	670
April	-4.6	53	6	6	74	448,436	6	47	50,597	**499,033**	192.5	11,552	**274,815**	106.0	6,361	**224,218**	86.5	5,190
May	3.5	57	42	42	223	1,343,672	42	15	15,766	**1,359,438**	507.6	30,453	**687,602**	256.7	15,403	**671,836**	250.8	15,050
June	10.3	86	93	93	31	184,556	93	-7	-7,898	**176,658**	68.2	4,089	**84,380**	32.6	1,953	**92,278**	35.6	2,136
July	13.7	112	118	118	8	50,808	118	-6	-6,395	**44,413**	16.6	995	**19,009**	7.1	426	**25,404**	9.5	569
August	12.4	103	99	98	7	44,560	99	5	5,271	**49,830**	18.6	1,116	**27,550**	10.3	617	**22,280**	8.3	499
September	7.1	94	54	54	23	138,304	54	40	43,437	**181,741**	70.1	4,207	**112,589**	43.4	2,606	**69,152**	26.7	1,601
October	0.1	79	14	14	40	240,116	14	65	70,386	**310,502**	115.9	6,956	**190,444**	71.1	4,266	**120,058**	44.8	2,689
November	-7.8	75	1	1	24	146,407	1	73	79,840	**226,247**	87.3	5,237	**153,044**	59.0	3,543	**73,203**	28.2	1,695
December	-17.7	64	0	0	2	11,801	0	64	69,195	**80,995**	30.2	1,814	**75,095**	28.0	1,682	**5,900**	2.2	132
Total	***-3.3 (Avg)***	**877**	**429**	**429**	**446**	**2,687,067**	**429**	**449**	**487,416**	**3,174,483**	**100.1**	**6,005**	**1,830,950**	**57.8**	**3,467**	**1,343,533**	**42.3**	**2,538**

Table A.1
Water Balance for Dumbell Lake (Average Year)

Phase 3 Mine Development

				(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-22.0	56	0	0	1	5,406	0	56	61,054	**66,460**	24.8	1,489	**63,757**	23.8	1,428	**2,703**	1.0	61
February	-20.4	43	0	0	2	12,950	0	43	46,390	**59,339**	24.5	1,472	**52,865**	21.9	1,311	**6,475**	2.7	161
March	-13.5	56	1	1	10	58,953	1	55	59,816	**118,769**	44.3	2,661	**89,293**	33.3	2,000	**29,477**	11.0	660
April	-4.6	53	6	6	74	442,148	6	47	50,610	**492,759**	190.1	11,406	**271,685**	104.8	6,289	**221,074**	85.3	5,117
May	3.5	57	42	42	223	1,324,834	42	15	15,770	**1,340,604**	500.5	30,031	**678,187**	253.2	15,192	**662,417**	247.3	14,839
June	10.3	86	93	93	31	181,968	93	-7	-7,900	**174,069**	67.2	4,029	**83,085**	32.1	1,923	**90,984**	35.1	2,106
July	13.7	112	118	118	8	50,095	118	-6	-6,397	**43,699**	16.3	979	**18,651**	7.0	418	**25,048**	9.4	561
August	12.4	103	99	98	7	43,935	99	5	5,272	**49,207**	18.4	1,102	**27,239**	10.2	610	**21,967**	8.2	492
September	7.1	94	54	54	23	136,365	54	40	43,449	**179,813**	69.4	4,162	**111,631**	43.1	2,584	**68,182**	26.3	1,578
October	0.1	79	14	14	40	236,750	14	65	70,404	**307,154**	114.7	6,881	**188,779**	70.5	4,229	**118,375**	44.2	2,652
November	-7.8	75	1	1	24	144,354	1	73	79,861	**224,215**	86.5	5,190	**152,038**	58.7	3,519	**72,177**	27.8	1,671
December	-17.7	64	0	0	2	11,635	0	64	69,213	**80,848**	30.2	1,811	**75,030**	28.0	1,681	**5,818**	2.2	130
Total	***-3.3 (Avg)***	**877**	**429**	**429**	**446**	**2,649,393**	**429**	**449**	**487,542**	**3,136,936**	**98.9**	**5,934**	**1,812,239**	**57.2**	**3,432**	**1,324,697**	**41.7**	**2,502**

Post-Closure

				(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-22.0	56	0	0	1	5,406	0	56	61,054	**66,460**	24.8	1,489	**63,757**	23.8	1,428	**2,703**	1.0	61
February	-20.4	43	0	0	2	12,950	0	43	46,390	**59,339**	24.5	1,472	**52,865**	21.9	1,311	**6,475**	2.7	161
March	-13.5	56	1	1	10	58,953	1	55	59,816	**118,769**	44.3	2,661	**89,293**	33.3	2,000	**29,477**	11.0	660
April	-4.6	53	6	6	74	442,148	6	47	50,610	**492,759**	190.1	11,406	**271,685**	104.8	6,289	**221,074**	85.3	5,117
May	3.5	57	42	42	223	1,324,834	42	15	15,770	**1,340,604**	500.5	30,031	**678,187**	253.2	15,192	**662,417**	247.3	14,839
June	10.3	86	93	93	31	181,968	93	-7	-7,900	**174,069**	67.2	4,029	**83,085**	32.1	1,923	**90,984**	35.1	2,106
July	13.7	112	118	118	8	50,095	118	-6	-6,397	**43,699**	16.3	979	**18,651**	7.0	418	**25,048**	9.4	561
August	12.4	103	99	98	7	43,935	99	5	5,272	**49,207**	18.4	1,102	**27,239**	10.2	610	**21,967**	8.2	492
September	7.1	94	54	54	23	136,365	54	40	43,449	**179,813**	69.4	4,162	**111,631**	43.1	2,584	**68,182**	26.3	1,578
October	0.1	79	14	14	40	236,750	14	65	70,404	**307,154**	114.7	6,881	**188,779**	70.5	4,229	**118,375**	44.2	2,652
November	-7.8	75	1	1	24	144,354	1	73	79,861	**224,215**	86.5	5,190	**152,038**	58.7	3,519	**72,177**	27.8	1,671
December	-17.7	64	0	0	2	11,635	0	64	69,213	**80,848**	30.2	1,811	**75,030**	28.0	1,681	**5,818**	2.2	130
Total	***-3.3 (Avg)***	**877**	**429**	**429**	**446**	**2,649,393**	**429**	**449**	**487,542**	**3,136,936**	**98.9**	**5,934**	**1,812,239**	**57.2**	**3,432**	**1,324,697**	**41.7**	**2,502**

Existing Conditions

				(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	(L/min)	Total Runoff (m^3)	Average Runoff (L/s)	(L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	(L/min)
January	-21.6	91	0	0	0	0	0	91	99,326	**99,326**	37.1	2,225	**99,326**	37.1	2,225	**0**	0.0	0
February	-21.1	60	0	0	0	0	0	60	65,094	**65,094**	26.9	1,614	**65,094**	26.9	1,614	**0**	0.0	0
March	-12.9	116	0	0	0	1,439	0	116	125,516	**126,955**	47.4	2,844	**126,236**	47.1	2,828	**720**	0.3	16
April	-1.4	102	20	20	285	2,049,735	20	82	88,568	**2,138,302**	825.0	49,498	#######	429.6	25,774	**1,024,867**	395.4	23,724
May	3.1	42	41	41	176	1,263,811	41	1	1,195	**1,265,007**	472.3	28,338	**633,101**	236.4	14,182	**631,906**	235.9	14,156
June	12.1	96	105	105	0	0	105	-9	-9,780	**-9,780**	-3.8	-226	**-9,780**	-3.8	-226	**0**	0.0	0
July	12.8	156	112	112	35	248,300	112	44	47,272	**295,572**	110.4	6,621	**171,422**	64.0	3,840	**124,150**	46.4	2,781
August	11.8	93	95	95	0	0	95	-3	-2,934	**-2,934**	-1.1	-66	**-2,934**	-1.1	-66	**0**	0.0	0
September	8.0	124	60	60	62	444,061	60	64	69,985	**514,046**	198.3	11,899	**292,015**	112.7	6,760	**222,031**	85.7	5,140
October	0.2	85	12	12	67	484,365	12	73	79,439	**563,804**	210.5	12,630	**321,622**	120.1	7,205	**242,182**	90.4	5,425
November	-8.7	125	0	0	6	40,304	0	125	135,623	**175,926**	67.9	4,072	**155,774**	60.1	3,606	**20,152**	7.8	466
December	-20.6	97	0	0	0	0	0	97	105,194	**105,194**	39.3	2,357	**105,194**	39.3	2,357	**0**	0.0	0
Total	***-3.5 (Avg)***	**1185**	**445**	**445**	**630**	**4,532,015**	**445**	**740**	**804,498**	**5,336,513**	**169.2**	**10,151**	#######	**97.4**	**5,842**	**2,266,008**	**71.8**	**4,309**

Phase 1 Mine Development

				(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	(L/min)	Total Runoff (m^3)	Average Runoff (L/s)	(L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	(L/min)
January	-21.6	91	0	0	0	0	0	91	99,326	**99,326**	37.1	2,225	**99,326**	37.1	2,225	**0**	0.0	0
February	-21.1	60	0	0	0	0	0	60	65,094	**65,094**	26.9	1,614	**65,094**	26.9	1,614	**0**	0.0	0
March	-12.9	116	0	0	0	1,206	0	116	125,516	**126,722**	47.3	2,839	**126,119**	47.1	2,825	**603**	0.2	14
April	-1.4	102	20	20	285	1,716,725	20	82	88,568	**1,805,293**	696.5	41,789	**946,930**	365.3	21,920	**858,363**	331.2	19,870
May	3.1	42	41	41	176	1,058,487	41	1	1,195	**1,059,682**	395.6	23,738	**530,439**	198.0	11,883	**529,243**	197.6	11,856
June	12.1	96	105	105	0	0	105	-9	-9,780	**-9,780**	-3.8	-226	**-9,780**	-3.8	-226	**0**	0.0	0
July	12.8	156	112	112	35	207,960	112	44	47,272	**255,232**	95.3	5,718	**151,252**	56.5	3,388	**103,980**	38.8	2,329
August	11.8	93	95	95	0	0	95	-3	-2,934	**-2,934**	-1.1	-66	**-2,934**	-1.1	-66	**0**	0.0	0
September	8.0	124	60	60	62	371,917	60	64	69,985	**441,902**	170.5	10,229	**255,943**	98.7	5,925	**185,958**	71.7	4,305
October	0.2	85	12	12	67	405,673	12	73	79,439	**485,112**	181.1	10,867	**282,276**	105.4	6,323	**202,836**	75.7	4,544
November	-8.7	125	0	0	6	33,756	0	125	135,623	**169,378**	65.3	3,921	**152,500**	58.8	3,530	**16,878**	6.5	391
December	-20.6	97	0	0	0	0	0	97	105,194	**105,194**	39.3	2,357	**105,194**	39.3	2,357	**0**	0.0	0
Total	***-3.5 (Avg)***	**1185**	**445**	**445**	**630**	**3,795,723**	**445**	**740**	**804,498**	**4,600,221**	**145.8**	**8,750**	#######	**85.7**	**5,141**	**1,897,862**	**60.1**	**3,609**

Phase 3 Mine Development

				(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	(L/min)	Total Runoff (m^3)	Average Runoff (L/s)	(L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	(L/min)
January	-21.6	91	0	0	0	0	0	91	99,352	**99,352**	37.1	2,226	**99,352**	37.1	2,226	**0**	0.0	0
February	-21.1	60	0	0	0	0	0	60	65,111	**65,111**	26.9	1,615	**65,111**	26.9	1,615	**0**	0.0	0
March	-12.9	116	0	0	0	1,189	0	116	125,549	**126,737**	47.3	2,839	**126,143**	47.1	2,826	**594**	0.2	13
April	-1.4	102	20	20	285	1,692,656	20	82	88,591	**1,781,247**	687.2	41,233	**934,919**	360.7	21,642	**846,328**	326.5	19,591
May	3.1	42	41	41	176	1,043,646	41	1	1,196	**1,044,842**	390.1	23,406	**523,019**	195.3	11,716	**521,823**	194.8	11,690
June	12.1	96	105	105	0	0	105	-9	-9,783	**-9,783**	-3.8	-226	**-9,783**	-3.8	-226	**0**	0.0	0
July	12.8	156	112	112	35	205,044	112	44	47,285	**252,329**	94.2	5,653	**149,807**	55.9	3,356	**102,522**	38.3	2,297
August	11.8	93	95	95	0	0	95	-3	-2,935	**-2,935**	-1.1	-66	**-2,935**	-1.1	-66	**0**	0.0	0
September	8.0	124	60	60	62	366,703	60	64	70,003	**436,705**	168.5	10,109	**253,354**	97.7	5,865	**183,351**	70.7	4,244
October	0.2	85	12	12	67	399,985	12	73	79,460	**479,445**	179.0	10,740	**279,452**	104.3	6,260	**199,993**	74.7	4,480
November	-8.7	125	0	0	6	33,283	0	125	135,658	**168,940**	65.2	3,911	**152,299**	58.8	3,525	**16,641**	6.4	385
December	-20.6	97	0	0	0	0	0	97	105,222	**105,222**	39.3	2,357	**105,222**	39.3	2,357	**0**	0.0	0
Total	***-3.5 (Avg)***	**1185**	**445**	**445**	**630**	**3,742,506**	**445**	**740**	**804,706**	**4,547,212**	**144.2**	**8,650**	########	**84.9**	**5,091**	**1,871,253**	**59.3**	**3,558**

Post-Closure

				(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	(L/min)	Total Runoff (m^3)	Average Runoff (L/s)	(L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	(L/min)
January	-21.6	91	0	0	0	0	0	91	99,352	**99,352**	37.1	2,226	**99,352**	37.1	2,226	**0**	0.0	0
February	-21.1	60	0	0	0	0	0	60	65,111	**65,111**	26.9	1,615	**65,111**	26.9	1,615	**0**	0.0	0
March	-12.9	116	0	0	0	1,189	0	116	125,549	**126,737**	47.3	2,839	**126,143**	47.1	2,826	**594**	0.2	13
April	-1.4	102	20	20	285	1,692,656	20	82	88,591	**1,781,247**	687.2	41,233	**934,919**	360.7	21,642	**846,328**	326.5	19,591
May	3.1	42	41	41	176	1,043,646	41	1	1,196	**1,044,842**	390.1	23,406	**523,019**	195.3	11,716	**521,823**	194.8	11,690
June	12.1	96	105	105	0	0	105	-9	-9,783	**-9,783**	-3.8	-226	**-9,783**	-3.8	-226	**0**	0.0	0
July	12.8	156	112	112	35	205,044	112	44	47,285	**252,329**	94.2	5,653	**149,807**	55.9	3,356	**102,522**	38.3	2,297
August	11.8	93	95	95	0	0	95	-3	-2,935	**-2,935**	-1.1	-66	**-2,935**	-1.1	-66	**0**	0.0	0
September	8.0	124	60	60	62	366,703	60	64	70,003	**436,705**	168.5	10,109	**253,354**	97.7	5,865	**183,351**	70.7	4,244
October	0.2	85	12	12	67	399,985	12	73	79,460	**479,445**	179.0	10,740	**279,452**	104.3	6,260	**199,993**	74.7	4,480
November	-8.7	125	0	0	6	33,283	0	125	135,658	**168,940**	65.2	3,911	**152,299**	58.8	3,525	**16,641**	6.4	385
December	-20.6	97	0	0	0	0	0	97	105,222	**105,222**	39.3	2,357	**105,222**	39.3	2,357	**0**	0.0	0
Total	***-3.5 (Avg)***	**1185**	**445**	**445**	**630**	**3,742,506**	**445**	**740**	**804,706**	**4,547,212**	**144.2**	**8,650**	########	**84.9**	**5,091**	**1,871,253**	**59.3**	**3,558**

Existing Conditions

				(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-28.4	19	0	0	0	0	0	0	0	0	19	20,974	**20,974**	7.8	470	**20,974**	7.8	470	**0**	0.0	0
February	-21.0	35	0	0	0	0	0	0	0	0	35	38,144	**38,144**	15.8	946	**38,144**	15.8	946	**0**	0.0	0
March	-10.7	42	0	0	8	0	0	8	59,016	0	42	45,099	**104,115**	38.9	2,332	**74,607**	27.9	1,671	**29,508**	11.0	661
April	-5.8	31	2	2	24	0	2	24	170,571	2	29	30,971	**201,543**	77.8	4,665	**116,257**	44.9	2,691	**85,286**	32.9	1,974
May	2.9	30	38	38	219	0	38	219	1,578,324	38	-8	-8,802	**1,569,522**	586.0	35,160	**780,360**	291.4	17,481	**789,162**	294.6	17,678
June	9.5	58	89	89	0	0	89	0	0	89	-32	-34,232	**-34,232**	-13.2	-792	**-34,232**	-13.2	-792	**0**	0.0	0
July	13.7	76	117	117	0	0	117	0	0	117	-41	-44,664	**-44,664**	-16.7	-1,001	**-44,664**	-16.7	-1,001	**0**	0.0	0
August	13.3	93	104	98	0	0	102	0	0	104	-11	-11,737	**-11,737**	-4.4	-263	**-11,737**	-4.4	-263	**0**	0.0	0
September	6.5	62	51	51	0	0	51	0	0	51	11	11,954	**11,954**	4.6	277	**11,954**	4.6	277	**0**	0.0	0
October	0.6	128	16	16	46	0	16	41	297,960	16	112	122,039	**419,999**	156.8	9,409	**271,019**	101.2	6,071	**148,980**	55.6	3,337
November	-6.9	67	2	2	12	0	2	12	84,926	2	65	70,963	**155,889**	60.1	3,609	**113,426**	43.8	2,626	**42,463**	16.4	983
December	-21.2	35	0	0	0	0	0	0	0	0	35	37,709	**37,709**	14.1	845	**37,709**	14.1	845	**0**	0.0	0
Total	***-3.5 (Avg)***	**675**	**419**	**413**	**309**	**0**	**417**	**304**	**2,190,798**	**419**	**256**	**278,417**	**2,469,215**	**77.3**	**4,638**	#######	**43.1**	**2,585**	**1,095,399**	**34.2**	**2,053**

Phase 1 Mine Development

				(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-28.4	19	0	0	0	0	0	0	0	0	19	20,974	**20,974**	7.8	470	**20,974**	7.8	470	**0**	0.0	0
February	-21.0	35	0	0	0	0	0	0	0	0	35	38,144	**38,144**	15.8	946	**38,144**	15.8	946	**0**	0.0	0
March	-10.7	42	0	0	8	0	0	8	49,428	0	42	45,099	**94,527**	35.3	2,118	**69,813**	26.1	1,564	**24,714**	9.2	554
April	-5.8	31	2	2	24	0	2	24	142,860	2	29	30,971	**173,831**	67.1	4,024	**102,401**	39.5	2,370	**71,430**	27.6	1,653
May	2.9	30	38	38	219	0	38	219	1,321,903	38	-8	-8,802	**1,313,100**	490.3	29,415	**652,149**	243.5	14,609	**660,951**	246.8	14,806
June	9.5	58	89	89	0	0	89	0	0	89	-32	-34,232	**-34,232**	-13.2	-792	**-34,232**	-13.2	-792	**0**	0.0	0
July	13.7	76	117	117	0	0	117	0	0	117	-41	-44,664	**-44,664**	-16.7	-1,001	**-44,664**	-16.7	-1,001	**0**	0.0	0
August	13.3	93	104	98	0	0	102	0	0	104	-11	-11,737	**-11,737**	-4.4	-263	**-11,737**	-4.4	-263	**0**	0.0	0
September	6.5	62	51	51	0	0	51	0	0	51	11	11,954	**11,954**	4.6	277	**11,954**	4.6	277	**0**	0.0	0
October	0.6	128	16	16	46	0	16	41	249,552	16	112	122,039	**371,591**	138.7	8,324	**246,815**	92.2	5,529	**124,776**	46.6	2,795
November	-6.9	67	2	2	12	0	2	12	71,128	2	65	70,963	**142,091**	54.8	3,289	**106,527**	41.1	2,466	**35,564**	13.7	823
December	-21.2	35	0	0	0	0	0	0	0	0	35	37,709	**37,709**	14.1	845	**37,709**	14.1	845	**0**	0.0	0
Total	***-3.5 (Avg)***	**675**	**419**	**413**	**309**	**0**	**417**	**304**	**1,834,871**	**419**	**256**	**278,417**	**2,113,288**	**66.2**	**3,971**	#######	**37.5**	**2,252**	**917,435**	**28.7**	**1,719**

Phase 3 Mine Development

				(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-28.4	19	0	0	0	0	0	0	0	0	19	20,979	**20,979**	7.8	470	**20,979**	7.8	470	**0**	0.0	0
February	-21.0	35	0	0	0	0	0	0	0	0	35	38,154	**38,154**	15.8	946	**38,154**	15.8	946	**0**	0.0	0
March	-10.7	42	0	0	8	0	0	8	48,735	0	42	45,111	**93,846**	35.0	2,102	**69,478**	25.9	1,556	**24,368**	9.1	546
April	-5.8	31	2	2	24	0	2	24	140,857	2	29	30,980	**171,836**	66.3	3,978	**101,408**	39.1	2,347	**70,428**	27.2	1,630
May	2.9	30	38	38	219	0	38	219	1,303,369	38	-8	-8,805	**1,294,565**	483.3	29,000	**642,880**	240.0	14,401	**651,685**	243.3	14,599
June	9.5	58	89	89	0	0	89	0	0	89	-32	-34,241	**-34,241**	-13.2	-793	**-34,241**	-13.2	-793	**0**	0.0	0
July	13.7	76	117	117	0	0	117	0	0	117	-41	-44,676	**-44,676**	-16.7	-1,001	**-44,676**	-16.7	-1,001	**0**	0.0	0
August	13.3	93	104	98	0	0	102	0	0	104	-11	-11,740	**-11,740**	-4.4	-263	**-11,740**	-4.4	-263	**0**	0.0	0
September	6.5	62	51	51	0	0	51	0	0	51	11	11,957	**11,957**	4.6	277	**11,957**	4.6	277	**0**	0.0	0
October	0.6	128	16	16	46	0	16	41	246,053	16	112	122,070	**368,123**	137.4	8,246	**245,097**	91.5	5,491	**123,027**	45.9	2,756
November	-6.9	67	2	2	12	0	2	12	70,131	2	65	70,981	**141,112**	54.4	3,266	**106,047**	40.9	2,455	**35,066**	13.5	812
December	-21.2	35	0	0	0	0	0	0	0	0	35	37,719	**37,719**	14.1	845	**37,719**	14.1	845	**0**	0.0	0
Total	***-3.5 (Avg)***	**675**	**419**	**413**	**309**	**0**	**417**	**304**	**1,809,145**	**419**	**256**	**278,489**	**2,087,635**	**65.4**	**3,923**	#######	**37.1**	**2,228**	**904,573**	**28.3**	**1,695**

Post-Closure

				(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-28.4	19	0	0	0	0	0	0	0	0	19	20,979	**20,979**	7.8	470	**20,979**	7.8	470	**0**	0.0	0
February	-21.0	35	0	0	0	0	0	0	0	0	35	38,154	**38,154**	15.8	946	**38,154**	15.8	946	**0**	0.0	0
March	-10.7	42	0	0	8	0	0	8	48,735	0	42	45,111	**93,846**	35.0	2,102	**69,478**	25.9	1,556	**24,368**	9.1	546
April	-5.8	31	2	2	24	0	2	24	140,857	2	29	30,980	**171,836**	66.3	3,978	**101,408**	39.1	2,347	**70,428**	27.2	1,630
May	2.9	30	38	38	219	0	38	219	1,303,369	38	-8	-8,805	**1,294,565**	483.3	29,000	**642,880**	240.0	14,401	**651,685**	243.3	14,599
June	9.5	58	89	89	0	0	89	0	0	89	-32	-34,241	**-34,241**	-13.2	-793	**-34,241**	-13.2	-793	**0**	0.0	0
July	13.7	76	117	117	0	0	117	0	0	117	-41	-44,676	**-44,676**	-16.7	-1,001	**-44,676**	-16.7	-1,001	**0**	0.0	0
August	13.3	93	104	98	0	0	102	0	0	104	-11	-11,740	**-11,740**	-4.4	-263	**-11,740**	-4.4	-263	**0**	0.0	0
September	6.5	62	51	51	0	0	51	0	0	51	11	11,957	**11,957**	4.6	277	**11,957**	4.6	277	**0**	0.0	0
October	0.6	128	16	16	46	0	16	41	246,053	16	112	122,070	**368,123**	137.4	8,246	**245,097**	91.5	5,491	**123,027**	45.9	2,756
November	-6.9	67	2	2	12	0	2	12	70,131	2	65	70,981	**141,112**	54.4	3,266	**106,047**	40.9	2,455	**35,066**	13.5	812
December	-21.2	35	0	0	0	0	0	0	0	0	35	37,719	**37,719**	14.1	845	**37,719**	14.1	845	**0**	0.0	0
Total	***-3.5 (Avg)***	**675**	**419**	**413**	**309**	**0**	**417**	**304**	**1,809,145**	**419**	**256**	**278,489**	**2,087,635**	**65.4**	**3,923**	#######	**37.1**	**2,228**	**904,573**	**28.3**	**1,695**

Table A.4:
Water Balance for Leg Lake Watershed (Average Year)

Existing Conditions

				(3 mm Water Holding Capacity) Residential and Industrial			(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-22.0	56	0	0	1	67	0	1	0	0	1	13,402	0	56	67,399	**80,868**	30.2	1,812	**74,167**	27.7	1,661	**6,701**	2.5	150
February	-20.4	43	0	0	2	161	0	2	0	0	2	32,102	0	43	51,211	**83,474**	34.5	2,070	**67,423**	27.9	1,672	**16,051**	6.6	398
March	-13.5	56	1	1	11	783	1	10	0	1	10	146,144	1	55	66,033	**212,960**	79.5	4,771	**139,888**	52.2	3,134	**73,072**	27.3	1,637
April	-4.6	53	6	6	76	5,592	6	76	0	6	74	1,096,077	6	47	55,870	**1,157,539**	446.6	26,795	**609,501**	235.1	14,109	**548,038**	211.4	12,686
May	3.5	57	42	42	223	16,537	42	224	0	42	223	3,284,236	42	15	17,409	**3,318,181**	1238.9	74,332	**1,676,063**	625.8	37,546	**1,642,118**	613.1	36,786
June	10.3	86	93	80	31	2,266	93	29	0	93	31	451,096	93	-7	-8,721	**444,641**	171.5	10,293	**219,093**	84.5	5,072	**225,548**	87.0	5,221
July	13.7	112	118	101	11	809	113	9	0	118	8	124,185	118	-6	-7,061	**117,933**	44.0	2,642	**55,840**	20.8	1,251	**62,093**	23.2	1,391
August	12.4	103	99	87	16	1,215	92	8	0	98	7	108,914	99	5	5,820	**115,948**	43.3	2,597	**61,491**	23.0	1,377	**54,457**	20.3	1,220
September	7.1	94	54	53	39	2,884	53	27	0	54	23	338,046	54	40	47,964	**388,894**	150.0	9,002	**219,871**	84.8	5,090	**169,023**	65.2	3,913
October	0.1	79	14	14	52	3,852	14	46	0	14	40	586,898	14	65	77,721	**668,471**	249.6	14,975	**375,022**	140.0	8,401	**293,449**	109.6	6,574
November	-7.8	75	1	1	25	1,885	1	26	0	1	24	357,851	1	73	88,161	**447,897**	172.8	10,368	**268,971**	103.8	6,226	**178,925**	69.0	4,142
December	-17.7	64	0	0	3	186	0	2	0	0	2	28,843	0	64	76,406	**105,435**	39.4	2,362	**91,014**	34.0	2,039	**14,422**	5.4	323
Total	***-3.3 (Avg)***	**877**	**429**	**386**	**490**	**36,238**	**416**	**460**	**0**	**429**	**446**	**6,567,791**	**429**	**449**	**538,211**	**7,142,240**	**225.0**	**13,501**	**3,858,345**	**121.6**	**7,298**	**3,283,896**	**103.4**	**6,203**

Phase 1 Mine Development

				(3 mm Water Holding Capacity) Residential and Industrial			(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-22.0	56	0	0	1	67	0	1	694	0	1	12,320	0	56	67,399	**80,480**	30.0	1,803	**73,904**	27.6	1,656	**6,576**	2.5	147
February	-20.4	43	0	0	2	161	0	2	1,663	0	2	29,510	0	43	51,211	**82,545**	34.1	2,047	**66,792**	27.6	1,657	**15,753**	6.5	391
March	-13.5	56	1	1	11	783	1	10	7,872	1	10	134,343	1	55	66,033	**209,031**	78.0	4,683	**137,136**	51.2	3,072	**71,895**	26.8	1,611
April	-4.6	53	6	6	76	5,592	6	76	57,677	6	74	1,007,573	6	47	55,870	**1,126,712**	434.7	26,081	**588,319**	227.0	13,619	**538,393**	207.7	12,463
May	3.5	57	42	42	223	16,537	42	224	171,297	42	223	3,019,047	42	15	17,409	**3,224,289**	1203.8	72,229	**1,611,988**	601.8	36,111	**1,612,302**	602.0	36,118
June	10.3	86	93	80	31	2,266	93	29	22,058	93	31	414,672	93	-7	-8,721	**430,274**	166.0	9,960	**209,704**	80.9	4,854	**220,570**	85.1	5,106
July	13.7	112	118	101	11	809	113	9	6,587	118	8	114,158	118	-6	-7,061	**114,493**	42.7	2,565	**53,462**	20.0	1,198	**61,031**	22.8	1,367
August	12.4	103	99	87	16	1,215	92	8	6,134	98	7	100,119	99	5	5,820	**113,287**	42.3	2,538	**59,548**	22.2	1,334	**53,740**	20.1	1,204
September	7.1	94	54	53	39	2,884	53	27	20,443	54	23	310,750	54	40	47,964	**382,040**	147.4	8,844	**214,400**	82.7	4,963	**167,640**	64.7	3,881
October	0.1	79	14	14	52	3,852	14	46	35,195	14	40	539,508	14	65	77,721	**656,276**	245.0	14,702	**365,405**	136.4	8,186	**290,871**	108.6	6,516
November	-7.8	75	1	1	25	1,885	1	26	20,174	1	24	328,956	1	73	88,161	**439,176**	169.4	10,166	**262,593**	101.3	6,079	**176,582**	68.1	4,088
December	-17.7	64	0	0	3	186	0	2	1,616	0	2	26,514	0	64	76,406	**104,723**	39.1	2,346	**90,496**	33.8	2,027	**14,227**	5.3	319
Total	***-3.3 (Avg)***	**877**	**429**	**386**	**490**	**36,238**	**416**	**460**	**351,409**	**429**	**446**	**6,037,469**	**429**	**449**	**538,211**	**6,963,327**	**219.4**	**13,164**	**3,733,747**	**117.7**	**7,063**	**3,229,580**	**101.7**	**6,101**

Table A.4:
Water Balance for Leg Lake Watershed (Average Year)

Phase 3 Mine Development

				(3 mm Water Holding Capacity) Residential and Industrial			(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-22.0	56	0	0	1	67	0	1	717	0	1	11,641	0	56	61,879	**74,304**	27.7	1,665	**68,054**	25.4	1,524	**6,250**	2.3	140
February	-20.4	43	0	0	2	161	0	2	1,717	0	2	27,883	0	43	47,017	**76,778**	31.7	1,904	**61,807**	25.5	1,533	**14,972**	6.2	371
March	-13.5	56	1	1	11	783	1	10	8,124	1	10	126,940	1	55	60,625	**196,473**	73.4	4,401	**128,128**	47.8	2,870	**68,345**	25.5	1,531
April	-4.6	53	6	6	76	5,592	6	76	59,529	6	74	952,050	6	47	51,295	**1,068,466**	412.2	24,733	**556,723**	214.8	12,887	**511,742**	197.4	11,846
May	3.5	57	42	42	223	16,537	42	224	176,797	42	223	2,852,680	42	15	15,983	**3,061,997**	1143.2	68,593	**1,529,579**	571.1	34,265	**1,532,418**	572.1	34,328
June	10.3	86	93	80	31	2,266	93	29	22,766	93	31	391,821	93	-7	-8,006	**408,846**	157.7	9,464	**199,276**	76.9	4,613	**209,570**	80.9	4,851
July	13.7	112	118	101	11	809	113	9	6,799	118	8	107,867	118	-6	-6,483	**108,992**	40.7	2,442	**50,979**	19.0	1,142	**58,013**	21.7	1,300
August	12.4	103	99	87	16	1,215	92	8	6,330	98	7	94,602	99	5	5,343	**107,491**	40.1	2,408	**56,391**	21.1	1,263	**51,099**	19.1	1,145
September	7.1	94	54	53	39	2,884	53	27	21,099	54	23	293,626	54	40	44,036	**361,645**	139.5	8,371	**202,172**	78.0	4,680	**159,472**	61.5	3,691
October	0.1	79	14	14	52	3,852	14	46	36,325	14	40	509,778	14	65	71,356	**621,312**	232.0	13,918	**344,627**	128.7	7,720	**276,684**	103.3	6,198
November	-7.8	75	1	1	25	1,885	1	26	20,822	1	24	310,828	1	73	80,941	**414,476**	159.9	9,594	**246,569**	95.1	5,708	**167,907**	64.8	3,887
December	-17.7	64	0	0	3	186	0	2	1,668	0	2	25,053	0	64	70,148	**97,056**	36.2	2,174	**83,529**	31.2	1,871	**13,528**	5.1	303
Total	***-3.3 (Avg)***	**877**	**429**	**386**	**490**	**36,238**	**416**	**460**	**362,693**	**429**	**446**	**5,704,769**	**429**	**449**	**494,134**	**6,597,834**	**207.9**	**12,472**	**3,527,834**	**111.2**	**6,673**	**3,070,001**	**96.7**	**5,799**

Post-Closure

				(3 mm Water Holding Capacity) Residential and Industrial			(100 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-22.0	56	0	0	1	67	0	1	666	0	1	11,641	0	56	61,879	**74,253**	27.7	1,663	**68,033**	25.4	1,524	**6,220**	2.3	139
February	-20.4	43	0	0	2	161	0	2	1,448	0	2	27,883	0	43	47,017	**76,510**	31.6	1,898	**61,699**	25.5	1,530	**14,811**	6.1	367
March	-13.5	56	1	1	11	783	1	10	8,253	1	10	126,940	1	55	60,625	**196,601**	73.4	4,404	**128,179**	47.9	2,871	**68,422**	25.5	1,533
April	-4.6	53	6	6	76	5,592	6	71	55,909	6	74	952,050	6	47	51,295	**1,064,846**	410.8	24,649	**555,275**	214.2	12,854	**509,570**	196.6	11,796
May	3.5	57	42	42	223	16,537	42	225	177,450	42	223	2,852,680	42	15	15,983	**3,062,650**	1143.5	68,608	**1,529,840**	571.2	34,271	**1,532,810**	572.3	34,337
June	10.3	86	93	80	31	2,266	92	33	26,195	93	31	391,821	93	-7	-8,006	**412,275**	159.1	9,543	**200,648**	77.4	4,645	**211,628**	81.6	4,899
July	13.7	112	118	101	11	809	117	9	6,801	118	8	107,867	118	-6	-6,483	**108,994**	40.7	2,442	**50,980**	19.0	1,142	**58,014**	21.7	1,300
August	12.4	103	99	87	16	1,215	96	6	4,665	98	7	94,602	99	5	5,343	**105,826**	39.5	2,371	**55,725**	20.8	1,248	**50,100**	18.7	1,122
September	7.1	94	54	53	39	2,884	53	23	18,398	54	23	293,626	54	40	44,036	**358,944**	138.5	8,309	**201,092**	77.6	4,655	**157,852**	60.9	3,654
October	0.1	79	14	14	52	3,852	13	39	30,869	14	40	509,778	14	65	71,356	**615,855**	229.9	13,796	**342,445**	127.9	7,671	**273,410**	102.1	6,125
November	-7.8	75	1	1	25	1,885	1	22	17,126	1	24	310,828	1	73	80,941	**410,780**	158.5	9,509	**245,091**	94.6	5,673	**165,690**	63.9	3,835
December	-17.7	64	0	0	3	186	0	0	355	0	2	25,053	0	64	70,148	**95,743**	35.7	2,145	**83,004**	31.0	1,859	**12,740**	4.8	285
Total	***-3.3 (Avg)***	**877**	**429**	**386**	**490**	**36,238**	**422**	**442**	**8,673,671**	**429**	**446**	**5,704,769**	**429**	**449**	**494,134**	**6,583,277**	**207.4**	**12,445**	**3,522,011**	**111.0**	**6,662**	**3,061,266**	**96.4**	**5,783**

Existing Conditions

				(3 mm Water Holding Capacity) Residential and Industrial			(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-21.6	91	0	0	0	0	0	0	0	0	0	0	0	91	109,677	**109,677**	40.9	2,457	**109,677**	40.9	2,457	**0**	0.0	0
February	-21.1	60	0	0	0	0	0	0	0	0	0	0	0	60	71,878	**71,878**	29.7	1,783	**71,878**	29.7	1,783	**0**	0.0	0
March	-12.9	116	0	0	0	15	0	0	0	0	0	2,947	0	116	138,596	**141,558**	52.9	3,171	**140,084**	52.3	3,138	**1,473**	0.6	33
April	-1.4	102	20	20	285	21,075	20	285	0	20	285	4,196,060	20	82	97,797	**4,314,933**	1664.7	99,883	**2,216,903**	855.3	51,317	**2,098,030**	809.4	48,566
May	3.1	42	41	41	176	12,994	41	176	0	41	176	2,587,178	41	1	1,320	**2,601,492**	971.3	58,277	**1,307,903**	488.3	29,299	**1,293,589**	483.0	28,978
June	12.1	96	105	99	0	0	104	0	0	105	0	0	105	-9	-10,800	**-10,800**	-4.2	-250	**-10,800**	-4.2	-250	**0**	0.0	0
July	12.8	156	112	112	41	2,997	112	36	0	112	35	508,301	112	44	52,199	**563,496**	210.4	12,623	**309,346**	115.5	6,930	**254,150**	94.9	5,693
August	11.8	93	95	95	0	0	95	0	0	95	0	0	95	-3	-3,240	**-3,240**	-1.2	-73	**-3,240**	-1.2	-73	**0**	0.0	0
September	8.0	124	60	60	62	4,566	59	63	0	60	62	909,048	60	64	77,278	**990,892**	382.3	22,937	**536,368**	206.9	12,416	**454,524**	175.4	10,521
October	0.2	85	12	12	67	4,980	12	67	0	12	67	991,555	12	73	87,718	**1,084,253**	404.8	24,289	**588,475**	219.7	13,183	**495,778**	185.1	11,106
November	-8.7	125	0	0	6	414	0	6	0	0	6	82,507	0	125	149,756	**232,677**	89.8	5,386	**191,424**	73.9	4,431	**41,253**	15.9	955
December	-20.6	97	0	0	0	0	0	0	0	0	0	0	0	97	116,157	**116,157**	43.4	2,602	**116,157**	43.4	2,602	**0**	0.0	0
Total	***-3.5 (Avg)***	**1185**	**445**	**439**	**636**	**47,042**	**442**	**632**	**0**	**445**	**630**	**9,277,596**	**445**	**740**	**888,336**	**10,212,973**	**323.7**	**19,424**	**5,574,176**	**176.7**	**10,603**	**4,638,798**	**147.0**	**8,821**

Phase 1 Mine Development

				(3 mm Water Holding Capacity) Residential and Industrial			(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-21.6	91	0	0	0	0	0	0	0	0	0	0	0	91	109,677	**109,677**	40.9	2,457	**109,677**	40.9	2,457	**0**	0.0	0
February	-21.1	60	0	0	0	0	0	0	0	0	0	0	0	60	0	**0**	0.0	0	**0**	0.0	0	**0**	0.0	0
March	-12.9	116	0	0	0	15	0	0	153	0	0	2,709	0	116	0	**2,876**	1.1	64	**1,430**	0.5	32	**1,446**	0.5	32
April	-1.4	102	20	20	285	21,075	20	285	217,566	20	285	3,857,246	20	82	0	**4,095,886**	1580.2	94,812	**2,036,724**	785.8	47,146	**2,059,162**	794.4	47,666
May	3.1	42	41	41	176	12,994	41	176	134,280	41	176	2,378,274	41	1	0	**2,525,548**	942.9	56,576	**1,255,843**	468.9	28,133	**1,269,705**	474.1	28,443
June	12.1	96	105	99	0	0	104	0	0	105	0	0	105	-9	0	**0**	0.0	0	**0**	0.0	0	**0**	0.0	0
July	12.8	156	112	112	41	2,997	112	36	27,100	112	35	467,258	112	44	0	**497,355**	185.7	11,141	**247,466**	92.4	5,544	**249,889**	93.3	5,598
August	11.8	93	95	95	0	0	95	0	0	95	0	0	95	-3	0	**0**	0.0	0	**0**	0.0	0	**0**	0.0	0
September	8.0	124	60	60	62	4,566	59	63	47,788	60	62	835,646	60	64	0	**888,000**	342.6	20,556	**441,504**	170.3	10,220	**446,496**	172.3	10,336
October	0.2	85	12	12	67	4,980	12	67	51,452	12	67	911,491	12	73	0	**967,924**	361.4	21,683	**481,307**	179.7	10,782	**486,617**	181.7	10,901
November	-8.7	125	0	0	6	414	0	6	4,275	0	6	75,845	0	125	0	**80,534**	31.1	1,864	**40,047**	15.5	927	**40,487**	15.6	937
December	-20.6	97	0	0	0	0	0	0	0	0	0	0	0	97	0	**0**	0.0	0	**0**	0.0	0	**0**	0.0	0
Total	***-3.5 (Avg)***	**1185**	**445**	**439**	**636**	**47,042**	**442**	**632**	**482,614**	**445**	**630**	**8,528,467**	**445**	**740**	**109,677**	**9,167,800**	**290.5**	**17,429**	**4,613,998**	**146.2**	**8,770**	**4,553,802**	**144.3**	**8,659**

Phase 3 Mine Development

				(3 mm Water Holding Capacity) Residential and Industrial			(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-21.6	91	0	0	0	0	0	0	0	0	0	0	0	91	100,695	**100,695**	37.6	2,256	**100,695**	37.6	2,256	**0**	0.0	0
February	-21.1	60	0	0	0	0	0	0	0	0	0	0	0	60	65,992	**65,992**	27.3	1,637	**65,992**	27.3	1,637	**0**	0.0	0
March	-12.9	116	0	0	0	15	0	0	158	0	0	2,559	0	116	127,246	**129,978**	48.5	2,912	**128,603**	48.0	2,881	**1,374**	0.5	31
April	-1.4	102	20	20	285	21,075	20	285	224,552	20	285	3,644,689	20	82	89,788	**3,980,104**	1535.5	92,132	**2,023,029**	780.5	46,829	**1,957,075**	755.0	45,303
May	3.1	42	41	41	176	12,994	41	176	138,592	41	176	2,247,217	41	1	1,212	**2,400,015**	896.1	53,764	**1,193,251**	445.5	26,731	**1,206,763**	450.6	27,033
June	12.1	96	105	99	0	0	104	0	0	105	0	0	105	-9	-9,915	**-9,915**	-3.8	-230	**-9,915**	-3.8	-230	**0**	0.0	0
July	12.8	156	112	112	41	2,997	112	36	27,970	112	35	441,509	112	44	47,924	**520,400**	194.3	11,658	**282,863**	105.6	6,337	**237,537**	88.7	5,321
August	11.8	93	95	95	0	0	95	0	0	95	0	0	95	-3	-2,975	**-2,975**	-1.1	-67	**-2,975**	-1.1	-67	**0**	0.0	0
September	8.0	124	60	60	62	4,566	59	63	49,323	60	62	789,597	60	64	70,949	**914,435**	352.8	21,167	**490,043**	189.1	11,344	**424,392**	163.7	9,824
October	0.2	85	12	12	67	4,980	12	67	53,104	12	67	861,263	12	73	80,534	**999,881**	373.3	22,399	**537,387**	200.6	12,038	**462,494**	172.7	10,361
November	-8.7	125	0	0	6	414	0	6	4,412	0	6	71,665	0	125	137,492	**213,983**	82.6	4,953	**175,503**	67.7	4,063	**38,480**	14.8	891
December	-20.6	97	0	0	0	0	0	0	0	0	0	0	0	97	106,644	**106,644**	39.8	2,389	**106,644**	39.8	2,389	**0**	0.0	0
Total	***-3.5 (Avg)***	**1185**	**445**	**439**	**636**	**47,042**	**442**	**632**	**498,110**	**445**	**630**	**8,058,500**	**445**	**740**	**815,585**	**9,419,237**	**298.6**	**17,914**	**5,091,121**	**161.4**	**9,684**	**4,328,116**	**137.2**	**8,230**

Post-Closure

				(3 mm Water Holding Capacity) Residential and Industrial			(100 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-21.6	91	0	0	0	0	0	1	666	0	0	0	0	91	100,695	**101,360**	37.8	2,271	**100,961**	37.7	2,262	**399**	0.1	9
February	-21.1	60	0	0	0	0	0	2	1,448	0	0	0	0	60	65,992	**67,440**	27.9	1,673	**66,571**	27.5	1,651	**869**	0.4	22
March	-12.9	116	0	0	0	15	1	10	8,253	0	0	2,559	0	116	127,246	**138,073**	51.6	3,093	**131,841**	49.2	2,953	**6,231**	2.3	140
April	-1.4	102	20	20	285	21,075	6	71	55,909	20	285	3,644,689	20	82	89,788	**3,811,462**	1470.5	88,228	**1,955,572**	754.5	45,268	**1,855,890**	716.0	42,960
May	3.1	42	41	41	176	12,994	42	225	177,450	41	176	2,247,217	41	1	1,212	**2,438,873**	910.6	54,634	**1,208,795**	451.3	27,079	**1,230,079**	459.3	27,556
June	12.1	96	105	99	0	0	92	33	26,195	105	0	0	105	-9	-9,915	**16,280**	6.3	377	**563**	0.2	13	**15,717**	6.1	364
July	12.8	156	112	112	41	2,997	117	9	6,801	112	35	441,509	112	44	47,924	**499,231**	186.4	11,183	**274,396**	102.4	6,147	**224,835**	83.9	5,037
August	11.8	93	95	95	0	0	96	6	4,665	95	0	0	95	-3	-2,975	**1,691**	0.6	38	**-1,108**	-0.4	-25	**2,799**	1.0	63
September	8.0	124	60	60	62	4,566	53	23	18,398	60	62	789,597	60	64	70,949	**883,511**	340.9	20,452	**477,673**	184.3	11,057	**405,838**	156.6	9,394
October	0.2	85	12	12	67	4,980	13	39	30,869	12	67	861,263	12	73	80,534	**977,646**	365.0	21,901	**528,493**	197.3	11,839	**449,153**	167.7	10,062
November	-8.7	125	0	0	6	414	1	22	17,126	0	6	71,665	0	125	137,492	**226,697**	87.5	5,248	**180,589**	69.7	4,180	**46,108**	17.8	1,067
December	-20.6	97	0	0	0	0	0	0	355	0	0	0	0	97	106,644	**107,000**	39.9	2,397	**106,786**	39.9	2,392	**213**	0.1	5
Total	***-3.5 (Avg)***	**1185**	**445**	**439**	**636**	**47,042**	**422**	**442**	**348,136**	**445**	**630**	**8,058,500**	**445**	**740**	**815,585**	**9,269,263**	**293.7**	**17,624**	**5,031,131**	**159.5**	**9,568**	**4,238,132**	**134.3**	**8,056**

Existing Conditions

				(3 mm Water Holding Capacity) Residential and Industrial			(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-28.4	19	0	0	0	0	0	0	0	0	0	0	0	19	23,159	**23,159**	8.6	519	**23,159**	8.6	519	**0**	0.0	0
February	-21.0	35	0	0	0	0	0	0	0	0	0	0	0	35	42,119	**42,119**	17.4	1,045	**42,119**	17.4	1,045	**0**	0.0	0
March	-10.7	42	0	0	8	607	0	8	0	0	8	120,814	0	42	49,799	**171,219**	63.9	3,836	**110,812**	41.4	2,482	**60,407**	22.6	1,353
April	-5.8	31	2	2	24	1,754	2	24	0	2	24	349,181	2	29	34,199	**385,133**	148.6	8,915	**210,543**	81.2	4,874	**174,590**	67.4	4,041
May	2.9	30	38	38	219	16,228	37	220	0	38	219	3,231,025	38	-8	-9,720	**3,237,534**	1208.8	72,525	**1,622,021**	605.6	36,336	**1,615,513**	603.2	36,190
June	9.5	58	89	61	0	0	89	0	0	89	0	0	89	-32	-37,799	**-37,799**	-14.6	-875	**-37,799**	-14.6	-875	**0**	0.0	0
July	13.7	76	117	76	0	0	95	0	0	117	0	0	117	-41	-49,319	**-49,319**	-18.4	-1,105	**-49,319**	-18.4	-1,105	**0**	0.0	0
August	13.3	93	104	93	0	0	93	0	0	102	0	0	104	-11	-12,960	**-12,960**	-4.8	-290	**-12,960**	-4.8	-290	**0**	0.0	0
September	6.5	62	51	51	8	592	51	0	0	51	0	0	51	11	13,200	**13,792**	5.3	319	**13,792**	5.3	319	**0**	0.0	0
October	0.6	128	16	16	112	8,310	15	74	0	16	41	609,961	16	112	134,756	**753,028**	281.1	16,869	**448,047**	167.3	10,037	**304,981**	113.9	6,832
November	-6.9	67	2	2	12	873	2	12	0	2	12	173,854	2	65	78,358	**253,085**	97.6	5,858	**166,158**	64.1	3,846	**86,927**	33.5	2,012
December	-21.2	35	0	0	0	0	0	0	0	0	0	0	0	35	41,639	**41,639**	15.5	933	**41,639**	15.5	933	**0**	0.0	0
Total	***-3.5 (Avg)***	**675**	**419**	**338**	**383**	**28,364**	**384**	**337**	**0**	**417**	**304**	**4,484,834**	**419**	**256**	**307,432**	**4,820,630**	**150.8**	**9,046**	**2,578,213**	**80.7**	**4,843**	**2,242,417**	**70.0**	**4,202**

Phase 1 Mine Development

				(3 mm Water Holding Capacity) Residential and Industrial			(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-28.4	19	0	0	0	0	0	0	0	0	0	0	0	19	23,159	**23,159**	8.6	519	**23,159**	8.6	519	**0**	0.0	0
February	-21.0	35	0	0	0	0	0	0	0	0	0	0	0	35	42,119	**42,119**	17.4	1,045	**42,119**	17.4	1,045	**0**	0.0	0
March	-10.7	42	0	0	8	607	0	8	6,260	0	8	111,058	0	42	49,799	**167,724**	62.6	3,757	**108,439**	40.5	2,429	**59,285**	22.1	1,328
April	-5.8	31	2	2	24	1,754	2	24	18,092	2	24	320,986	2	29	34,199	**375,031**	144.7	8,681	**203,683**	78.6	4,715	**171,348**	66.1	3,966
May	2.9	30	38	38	219	16,228	37	220	167,640	38	219	2,970,133	38	-8	-9,720	**3,144,282**	1173.9	70,436	**1,558,631**	581.9	34,916	**1,585,651**	592.0	35,521
June	9.5	58	89	61	0	0	89	0	0	89	0	0	89	-32	-37,799	**-37,799**	-14.6	-875	**-37,799**	-14.6	-875	**0**	0.0	0
July	13.7	76	117	76	0	0	95	0	0	117	0	0	117	-41	-49,319	**-49,319**	-18.4	-1,105	**-49,319**	-18.4	-1,105	**0**	0.0	0
August	13.3	93	104	93	0	0	93	0	0	102	0	0	104	-11	-12,960	**-12,960**	-4.8	-290	**-12,960**	-4.8	-290	**0**	0.0	0
September	6.5	62	51	51	8	592	51	0	0	51	0	0	51	11	13,200	**13,792**	5.3	319	**13,792**	5.3	319	**0**	0.0	0
October	0.6	128	16	16	112	8,310	15	74	56,414	16	41	560,709	16	112	134,756	**760,190**	283.8	17,029	**445,987**	166.5	9,991	**314,203**	117.3	7,039
November	-6.9	67	2	2	12	873	2	12	9,008	2	12	159,816	2	65	78,358	**248,055**	95.7	5,742	**162,742**	62.8	3,767	**85,313**	32.9	1,975
December	-21.2	35	0	0	0	0	0	0	0	0	0	0	0	35	41,639	**41,639**	15.5	933	**41,639**	15.5	933	**0**	0.0	0
Total	***-3.5 (Avg)***	**675**	**419**	**338**	**383**	**28,364**	**384**	**337**	**257,414**	**417**	**304**	**4,122,702**	**419**	**256**	**307,432**	**4,715,912**	**147.5**	**8,849**	**2,500,113**	**78.3**	**4,697**	**2,215,800**	**69.2**	**4,152**

Phase 3 Mine Development

				(3 mm Water Holding Capacity) Residential and Industrial			(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-28.4	19	0	0	0	0	0	0	0	0	0	0	0	19	21,263	**21,263**	7.9	476	**21,263**	7.9	476	**0**	0.0	0
February	-21.0	35	0	0	0	0	0	0	0	0	0	0	0	35	38,670	**38,670**	16.0	959	**38,670**	16.0	959	**0**	0.0	0
March	-10.7	42	0	0	8	607	0	8	6,461	0	8	104,938	0	42	45,720	**157,726**	58.9	3,533	**101,381**	37.9	2,271	**56,346**	21.0	1,262
April	-5.8	31	2	2	24	1,754	2	24	18,673	2	24	303,298	2	29	31,398	**355,123**	137.0	8,220	**192,270**	74.2	4,451	**162,853**	62.8	3,770
May	2.9	30	38	38	219	16,228	37	220	173,023	38	219	2,806,462	38	-8	-8,924	**2,986,789**	1115.1	66,908	**1,479,745**	552.5	33,148	**1,507,045**	562.7	33,760
June	9.5	58	89	61	0	0	89	0	0	89	0	0	89	-32	-34,703	**-34,703**	-13.4	-803	**-34,703**	-13.4	-803	**0**	0.0	0
July	13.7	76	117	76	0	0	95	0	0	117	0	0	117	-41	-45,280	**-45,280**	-16.9	-1,014	**-45,280**	-16.9	-1,014	**0**	0.0	0
August	13.3	93	104	93	0	0	93	0	0	102	0	0	104	-11	-11,898	**-11,898**	-4.4	-267	**-11,898**	-4.4	-267	**0**	0.0	0
September	6.5	62	51	51	8	592	51	0	0	51	0	0	51	11	12,119	**12,711**	4.9	294	**12,711**	4.9	294	**0**	0.0	0
October	0.6	128	16	16	112	8,310	15	74	58,226	16	41	529,811	16	112	123,720	**720,067**	268.8	16,131	**420,226**	156.9	9,414	**299,841**	111.9	6,717
November	-6.9	67	2	2	12	873	2	12	9,297	2	12	151,009	2	65	71,941	**233,120**	89.9	5,396	**152,037**	58.7	3,519	**81,083**	31.3	1,877
December	-21.2	35	0	0	0	0	0	0	0	0	0	0	0	35	38,229	**38,229**	14.3	856	**38,229**	14.3	856	**0**	0.0	0
Total	***-3.5 (Avg)***	**675**	**419**	**338**	**383**	**28,364**	**384**	**337**	**265,680**	**417**	**304**	**3,895,517**	**419**	**256**	**282,254**	**4,471,816**	**139.8**	**8,391**	**2,364,649**	**74.0**	**4,442**	**2,107,167**	**65.8**	**3,949**

Post-Closure

				(3 mm Water Holding Capacity) Residential and Industrial			(100 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-28.4	19	0	0	0	0	0	0	0	0	0	0	0	19	21,263	**21,263**	7.9	476	**21,263**	7.9	476	**0**	0.0	0
February	-21.0	35	0	0	0	0	0	0	0	0	0	0	0	35	38,670	**38,670**	16.0	959	**38,670**	16.0	959	**0**	0.0	0
March	-10.7	42	0	0	8	607	0	8	6,461	0	8	104,938	0	42	45,720	**157,726**	58.9	3,533	**101,381**	37.9	2,271	**56,346**	21.0	1,262
April	-5.8	31	2	2	24	1,754	2	24	18,673	2	24	303,298	2	29	31,398	**355,123**	137.0	8,220	**192,270**	74.2	4,451	**162,853**	62.8	3,770
May	2.9	30	38	38	219	16,228	37	220	173,023	38	219	2,806,462	38	-8	-8,924	**2,986,789**	1115.1	66,908	**1,479,745**	552.5	33,148	**1,507,045**	562.7	33,760
June	9.5	58	89	61	0	0	89	0	0	89	0	0	89	-32	-34,703	**-34,703**	-13.4	-803	**-34,703**	-13.4	-803	**0**	0.0	0
July	13.7	76	117	76	0	0	95	0	0	117	0	0	117	-41	-45,280	**-45,280**	-16.9	-1,014	**-45,280**	-16.9	-1,014	**0**	0.0	0
August	13.3	93	104	93	0	0	93	0	0	102	0	0	104	-11	-11,898	**-11,898**	-4.4	-267	**-11,898**	-4.4	-267	**0**	0.0	0
September	6.5	62	51	51	8	592	51	0	0	51	0	0	51	11	12,119	**12,711**	4.9	294	**12,711**	4.9	294	**0**	0.0	0
October	0.6	128	16	16	112	8,310	15	74	58,226	16	41	529,811	16	112	123,720	**720,067**	268.8	16,131	**420,226**	156.9	9,414	**299,841**	111.9	6,717
November	-6.9	67	2	2	12	873	2	12	9,297	2	12	151,009	2	65	71,941	**233,120**	89.9	5,396	**152,037**	58.7	3,519	**81,083**	31.3	1,877
December	-21.2	35	0	0	0	0	0	0	0	0	0	0	0	35	38,229	**38,229**	14.3	856	**38,229**	14.3	856	**0**	0.0	0
Total	***-3.5 (Avg)***	**675**	**419**	**338**	**383**	**28,364**	**384**	**337**	**265,680**	**417**	**304**	**3,895,517**	**419**	**256**	**282,254**	**4,471,816**	**139.8**	**8,391**	**2,364,649**	**74.0**	**4,442**	**2,107,167**	**65.8**	**3,949**

Table A.7:
Water Balance for Leg Lake Catchment (Average Year)

Existing Conditions

				(3 mm Water Holding Capacity) Residential and Industrial			(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	**Temperature (°C)**	**Precipitation (mm)**	**Potential Evapotranspiration (mm)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Potential Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Total Surplus (m^3)**	**Average Surplus (Runoff and Infiltration) (L/s)**	**Average Surplus (Runoff and Infiltration) (L/min)**	**Total Runoff (m^3)**	**Average Runoff (L/s)**	**Average Runoff (L/min)**	**Total Infiltration (m^3)**	**Average Infiltration (L/s)**	**Average Infiltration (L/min)**
January	-22.0	56	0	0	1	0	0	1	0	0	1	5,205	0	56	45,679	**50,884**	19.0	1,140	**48,281**	18.0	1,082	**2,602**	1.0	58
February	-20.4	43	0	0	2	0	0	2	0	0	2	12,467	0	43	34,708	**47,175**	19.5	1,170	**40,941**	16.9	1,015	**6,233**	2.6	155
March	-13.5	56	1	1	11	0	1	10	0	1	10	56,755	1	55	44,753	**101,508**	37.9	2,274	**73,131**	27.3	1,638	**28,378**	10.6	636
April	-4.6	53	6	6	76	0	6	76	0	6	74	425,664	6	47	37,865	**463,529**	178.8	10,730	**250,697**	96.7	5,803	**212,832**	82.1	4,927
May	3.5	57	42	42	223	0	42	224	0	42	223	1,275,440	42	15	11,799	**1,287,239**	480.6	28,836	**649,519**	242.5	14,550	**637,720**	238.1	14,286
June	10.3	86	93	80	31	0	93	29	0	93	31	175,184	93	-7	-5,910	**169,274**	65.3	3,918	**81,682**	31.5	1,891	**87,592**	33.8	2,028
July	13.7	112	118	101	11	0	113	9	0	118	8	48,228	118	-6	-4,786	**43,442**	16.2	973	**19,328**	7.2	433	**24,114**	9.0	540
August	12.4	103	99	87	16	0	92	8	0	98	7	42,297	99	5	3,944	**46,241**	17.3	1,036	**25,093**	9.4	562	**21,148**	7.9	474
September	7.1	94	54	53	39	0	53	27	0	54	23	131,281	54	40	32,507	**163,788**	63.2	3,791	**98,148**	37.9	2,272	**65,640**	25.3	1,519
October	0.1	79	14	14	52	0	14	46	0	14	40	227,923	14	65	52,675	**280,598**	104.8	6,286	**166,636**	62.2	3,733	**113,962**	42.5	2,553
November	-7.8	75	1	1	25	0	1	26	0	1	24	138,972	1	73	59,750	**198,722**	76.7	4,600	**129,236**	49.9	2,992	**69,486**	26.8	1,608
December	-17.7	64	0	0	3	0	0	2	0	0	2	11,201	0	64	51,783	**62,985**	23.5	1,411	**57,384**	21.4	1,285	**5,601**	2.1	125
Total	***-3.3 (Avg)***	**877**	**429**	**386**	**490**	**0**	**416**	**460**	**0**	**429**	**446**	**2,550,617**	**429**	**449**	**364,767**	**2,915,384**	**91.9**	**5,514**	**1,640,076**	**51.7**	**3,105**	**1,275,308**	**40.2**	**2,409**

Phase 1 Mine Development

				(3 mm Water Holding Capacity) Residential and Industrial			(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	**Temperature (°C)**	**Precipitation (mm)**	**Potential Evapotranspiration (mm)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Potential Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Total Surplus (m^3)**	**Average Surplus (Runoff and Infiltration) (L/s)**	**Average Surplus (Runoff and Infiltration) (L/min)**	**Total Runoff (m^3)**	**Average Runoff (L/s)**	**Average Runoff (L/min)**	**Total Infiltration (m^3)**	**Average Infiltration (L/s)**	**Average Infiltration (L/min)**
January	-22.0	56	0	0	1	0	0	1	271	0	1	4,453	0	56	45,413	**50,137**	18.7	1,123	**47,748**	17.8	1,070	**2,389**	0.9	54
February	-20.4	43	0	0	2	0	0	2	648	0	2	10,667	0	43	34,506	**45,820**	18.9	1,136	**40,098**	16.6	994	**5,722**	2.4	142
March	-13.5	56	1	1	11	0	1	10	3,068	1	10	48,560	1	55	44,492	**96,120**	35.9	2,153	**70,000**	26.1	1,568	**26,121**	9.8	585
April	-4.6	53	6	6	76	0	6	76	22,477	6	74	364,202	6	47	37,645	**424,324**	163.7	9,822	**228,737**	88.2	5,295	**195,587**	75.5	4,527
May	3.5	57	42	42	223	0	42	224	66,756	42	223	1,091,279	42	15	11,730	**1,169,765**	436.7	26,204	**584,072**	218.1	13,084	**585,693**	218.7	13,120
June	10.3	86	93	80	31	0	93	29	8,596	93	31	149,889	93	-7	-5,876	**152,609**	58.9	3,533	**72,507**	28.0	1,678	**80,102**	30.9	1,854
July	13.7	112	118	101	11	0	113	9	2,567	118	8	41,264	118	-6	-4,758	**39,073**	14.6	875	**16,901**	6.3	379	**22,172**	8.3	497
August	12.4	103	99	87	16	0	92	8	2,390	98	7	36,190	99	5	3,921	**42,501**	15.9	952	**22,972**	8.6	515	**19,529**	7.3	437
September	7.1	94	54	53	39	0	53	27	7,967	54	23	112,325	54	40	32,318	**152,610**	58.9	3,533	**91,667**	35.4	2,122	**60,943**	23.5	1,411
October	0.1	79	14	14	52	0	14	46	13,716	14	40	195,013	14	65	52,368	**261,097**	97.5	5,849	**155,361**	58.0	3,480	**105,736**	39.5	2,369
November	-7.8	75	1	1	25	0	1	26	7,862	1	24	118,906	1	73	59,402	**186,170**	71.8	4,309	**122,000**	47.1	2,824	**64,170**	24.8	1,485
December	-17.7	64	0	0	3	0	0	2	630	0	2	9,584	0	64	51,482	**61,695**	23.0	1,382	**56,525**	21.1	1,266	**5,170**	1.9	116
Total	***-3.3 (Avg)***	**877**	**429**	**386**	**490**	**0**	**416**	**460**	**136,948**	**429**	**446**	**2,182,333**	**429**	**449**	**362,642**	**2,681,923**	**84.5**	**5,073**	**1,508,588**	**47.6**	**2,856**	**1,173,335**	**36.9**	**2,216**

Table A.7:
Water Balance for Leg Lake Catchment (Average Year)

Phase 3 Mine Development

				(3 mm Water Holding Capacity) Residential and Industrial			(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-22.0	56	0	0	1	0	0	1	271	0	1	3,887	0	56	39,392	**43,550**	16.3	976	**41,444**	15.5	928	**2,106**	0.8	47
February	-20.4	43	0	0	2	0	0	2	648	0	2	9,312	0	43	29,931	**39,890**	16.5	989	**34,846**	14.4	864	**5,045**	2.1	125
March	-13.5	56	1	1	11	0	1	10	3,068	1	10	42,392	1	55	38,593	**84,053**	31.4	1,883	**61,016**	22.8	1,367	**23,036**	8.6	516
April	-4.6	53	6	6	76	0	6	76	22,477	6	74	317,936	6	47	32,654	**373,067**	143.9	8,636	**200,613**	77.4	4,644	**172,455**	66.5	3,992
May	3.5	57	42	42	223	0	42	224	66,756	42	223	952,651	42	15	10,175	**1,029,581**	384.4	23,064	**513,202**	191.6	11,496	**516,379**	192.8	11,568
June	10.3	86	93	80	31	0	93	29	8,596	93	31	130,848	93	-7	-5,097	**134,348**	51.8	3,110	**63,766**	24.6	1,476	**70,582**	27.2	1,634
July	13.7	112	118	101	11	0	113	9	2,567	118	8	36,022	118	-6	-4,127	**34,462**	12.9	772	**14,911**	5.6	334	**19,551**	7.3	438
August	12.4	103	99	87	16	0	92	8	2,390	98	7	31,592	99	5	3,401	**37,384**	14.0	837	**20,154**	7.5	451	**17,230**	6.4	386
September	7.1	94	54	53	39	0	53	27	7,967	54	23	98,056	54	40	28,033	**134,056**	51.7	3,103	**80,248**	31.0	1,858	**53,808**	20.8	1,246
October	0.1	79	14	14	52	0	14	46	13,716	14	40	170,240	14	65	45,425	**229,380**	85.6	5,138	**136,031**	50.8	3,047	**93,350**	34.9	2,091
November	-7.8	75	1	1	25	0	1	26	7,862	1	24	103,801	1	73	51,526	**163,189**	63.0	3,778	**106,571**	41.1	2,467	**56,618**	21.8	1,311
December	-17.7	64	0	0	3	0	0	2	630	0	2	8,367	0	64	44,656	**53,652**	20.0	1,202	**49,091**	18.3	1,100	**4,561**	1.7	102
Total	***-3.3 (Avg)***	**877**	**429**	**386**	**490**	**0**	**416**	**460**	**136,948**	**429**	**446**	**1,905,104**	**429**	**449**	**314,561**	**2,356,613**	**74.3**	**4,457**	**1,321,892**	**41.7**	**2,503**	**1,034,721**	**32.6**	**1,955**

Post-Closure

				(3 mm Water Holding Capacity) Residential and Industrial			(100 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-22.0	56	0	0	1	0	0	1	251	0	1	3,887	0	56	39,392	**43,530**	16.3	975	**41,436**	15.5	928	**2,094**	0.8	47
February	-20.4	43	0	0	2	0	0	2	547	0	2	9,312	0	43	29,931	**39,789**	16.4	987	**34,805**	14.4	863	**4,984**	2.1	124
March	-13.5	56	1	1	11	0	1	10	3,116	1	10	42,392	1	55	38,593	**84,101**	31.4	1,884	**61,036**	22.8	1,367	**23,065**	8.6	517
April	-4.6	53	6	6	76	0	6	71	21,110	6	74	317,936	6	47	32,654	**371,701**	143.4	8,604	**200,066**	77.2	4,631	**171,635**	66.2	3,973
May	3.5	57	42	42	223	0	42	225	67,003	42	223	952,651	42	15	10,175	**1,029,828**	384.5	23,070	**513,301**	191.6	11,499	**516,527**	192.8	11,571
June	10.3	86	93	80	31	0	92	33	9,891	93	31	130,848	93	-7	-5,097	**135,642**	52.3	3,140	**64,284**	24.8	1,488	**71,359**	27.5	1,652
July	13.7	112	118	101	11	0	117	9	2,568	118	8	36,022	118	-6	-4,127	**34,463**	12.9	772	**14,911**	5.6	334	**19,552**	7.3	438
August	12.4	103	99	87	16	0	96	6	1,762	98	7	31,592	99	5	3,401	**36,755**	13.7	823	**19,902**	7.4	446	**16,853**	6.3	378
September	7.1	94	54	53	39	0	53	23	6,947	54	23	98,056	54	40	28,033	**133,036**	51.3	3,080	**79,840**	30.8	1,848	**53,196**	20.5	1,231
October	0.1	79	14	14	52	0	13	39	11,656	14	40	170,240	14	65	45,425	**227,320**	84.9	5,092	**135,207**	50.5	3,029	**92,113**	34.4	2,063
November	-7.8	75	1	1	25	0	1	22	6,467	1	24	103,801	1	73	51,526	**161,793**	62.4	3,745	**106,013**	40.9	2,454	**55,780**	21.5	1,291
December	-17.7	64	0	0	3	0	0	0	134	0	2	8,367	0	64	44,656	**53,156**	19.8	1,191	**48,893**	18.3	1,095	**4,264**	1.6	96
Total	***-3.3 (Avg)***	**877**	**429**	**386**	**490**	**0**	**422**	**442**	**131,451**	**429**	**446**	**1,905,104**	**429**	**449**	**314,561**	**2,351,116**	**74.1**	**4,447**	**1,319,693**	**41.6**	**2,499**	**1,031,423**	**32.5**	**1,948**

Existing Conditions

			(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-21.6	91	0	0	0	0	0	0	0	0	91	74,333	**74,333**	27.8	1,665	**74,333**	27.8	1,665	**0**	0.0	0
February	-21.1	60	0	0	0	0	0	0	0	0	60	48,715	**48,715**	20.1	1,208	**48,715**	20.1	1,208	**0**	0.0	0
March	-12.9	116	0	0	0	0	0	0	1,144	0	116	93,932	**95,077**	35.5	2,130	**94,505**	35.3	2,117	**572**	0.2	13
April	-1.4	102	20	20	285	0	20	285	1,629,550	20	82	66,281	**1,695,831**	654.3	39,255	**881,056**	339.9	20,395	**814,775**	314.3	18,861
May	3.1	42	41	41	176	0	41	176	1,004,736	41	1	895	**1,005,631**	375.5	22,528	**503,263**	187.9	11,274	**502,368**	187.6	11,254
June	12.1	96	105	104	0	0	105	0	0	105	-9	-7,319	**-7,319**	-2.8	-169	**-7,319**	-2.8	-169	**0**	0.0	0
July	12.8	156	112	112	36	0	112	35	197,400	112	44	35,377	**232,777**	86.9	5,215	**134,077**	50.1	3,004	**98,700**	36.9	2,211
August	11.8	93	95	95	0	0	95	0	0	95	-3	-2,196	**-2,196**	-0.8	-49	**-2,196**	-0.8	-49	**0**	0.0	0
September	8.0	124	60	59	63	0	60	62	353,031	60	64	52,374	**405,405**	156.4	9,384	**228,890**	88.3	5,298	**176,515**	68.1	4,086
October	0.2	85	12	12	67	0	12	67	385,073	12	73	59,450	**444,522**	166.0	9,958	**251,986**	94.1	5,645	**192,536**	71.9	4,313
November	-8.7	125	0	0	6	0	0	6	32,042	0	125	101,496	**133,537**	51.5	3,091	**117,517**	45.3	2,720	**16,021**	6.2	371
December	-20.6	97	0	0	0	0	0	0	0	0	97	78,724	**78,724**	29.4	1,764	**78,724**	29.4	1,764	**0**	0.0	0
Total	***-3.5 (Avg)***	**1185**	**445**	**442**	**632**	**0**	**445**	**630**	**3,602,975**	**445**	**740**	**602,062**	**4,205,037**	**133.3**	**7,998**	**2,403,549**	**76.2**	**4,573**	**1,801,488**	**57.1**	**3,426**

Phase 1 Mine Development

			(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-21.6	91	0	0	0	0	0	0	0	0	91	73,900	**73,900**	27.6	1,655	**73,900**	27.6	1,655	**0**	0.0	0
February	-21.1	60	0	0	0	0	0	0	0	0	60	48,431	**48,431**	20.0	1,201	**48,431**	20.0	1,201	**0**	0.0	0
March	-12.9	116	0	0	0	60	0	0	979	0	116	93,385	**94,424**	35.3	2,115	**93,898**	35.1	2,103	**525**	0.2	12
April	-1.4	102	20	20	285	84,788	20	285	1,394,259	20	82	65,895	**1,544,941**	596.0	35,763	**796,939**	307.5	18,448	**748,002**	288.6	17,315
May	3.1	42	41	41	176	52,330	41	176	859,662	41	1	889	**912,882**	340.8	20,450	**451,653**	168.6	10,118	**461,229**	172.2	10,332
June	12.1	96	105	104	0	0	105	0	0	105	-9	-7,277	**-7,277**	-2.8	-168	**-7,277**	-2.8	-168	**0**	0.0	0
July	12.8	156	112	112	36	10,561	112	35	168,897	112	44	35,171	**214,629**	80.1	4,808	**123,844**	46.2	2,774	**90,785**	33.9	2,034
August	11.8	93	95	95	0	0	95	0	0	95	-3	-2,183	**-2,183**	-0.8	-49	**-2,183**	-0.8	-49	**0**	0.0	0
September	8.0	124	60	59	63	18,624	60	62	302,057	60	64	52,069	**372,749**	143.8	8,628	**210,547**	81.2	4,874	**162,202**	62.6	3,755
October	0.2	85	12	12	67	20,052	12	67	329,472	12	73	59,103	**408,627**	152.6	9,154	**231,860**	86.6	5,194	**176,767**	66.0	3,960
November	-8.7	125	0	0	6	1,666	0	6	27,415	0	125	100,904	**129,986**	50.1	3,009	**115,278**	44.5	2,668	**14,707**	5.7	340
December	-20.6	97	0	0	0	0	0	0	0	0	97	78,266	**78,266**	29.2	1,753	**78,266**	29.2	1,753	**0**	0.0	0
Total	***-3.5 (Avg)***	**1185**	**445**	**442**	**632**	**188,080**	**445**	**630**	**3,082,741**	**445**	**740**	**598,554**	**3,869,375**	**122.7**	**7,360**	**2,215,156**	**70.2**	**4,214**	**1,654,218**	**52.4**	**3,146**

Phase 3 Mine Development

				(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-21.6	91	0	0	0	0	0	0	0	0	91	64,101	**64,101**	23.9	1,436	**64,101**	23.9	1,436	**0**	0.0	0
February	-21.1	60	0	0	0	0	0	0	0	0	60	42,010	**42,010**	17.4	1,042	**42,010**	17.4	1,042	**0**	0.0	0
March	-12.9	116	0	0	0	60	0	0	855	0	116	81,003	**81,918**	30.6	1,835	**81,455**	30.4	1,825	**463**	0.2	10
April	-1.4	102	20	20	285	84,788	20	285	1,217,142	20	82	57,158	**1,359,087**	524.3	31,460	**699,644**	269.9	16,195	**659,443**	254.4	15,265
May	3.1	42	41	41	176	52,330	41	176	750,457	41	1	771	**803,558**	300.0	18,001	**396,932**	148.2	8,892	**406,627**	151.8	9,109
June	12.1	96	105	104	0	0	105	0	0	105	-9	-6,312	**-6,312**	-2.4	-146	**-6,312**	-2.4	-146	**0**	0.0	0
July	12.8	156	112	112	36	10,561	112	35	147,442	112	44	30,508	**188,511**	70.4	4,223	**108,453**	40.5	2,430	**80,058**	29.9	1,793
August	11.8	93	95	95	0	0	95	0	0	95	-3	-1,894	**-1,894**	-0.7	-42	**-1,894**	-0.7	-42	**0**	0.0	0
September	8.0	124	60	59	63	18,624	60	62	263,686	60	64	45,166	**327,475**	126.3	7,580	**184,458**	71.2	4,270	**143,017**	55.2	3,311
October	0.2	85	12	12	67	20,052	12	67	287,618	12	73	51,267	**358,937**	134.0	8,041	**203,097**	75.8	4,550	**155,840**	58.2	3,491
November	-8.7	125	0	0	6	1,666	0	6	23,933	0	125	87,526	**113,124**	43.6	2,619	**100,158**	38.6	2,318	**12,966**	5.0	300
December	-20.6	97	0	0	0	0	0	0	0	0	97	67,889	**67,889**	25.3	1,521	**67,889**	25.3	1,521	**0**	0.0	0
Total	***-3.5 (Avg)***	**1185**	**445**	**442**	**632**	**188,080**	**445**	**630**	**2,691,131**	**445**	**740**	**519,194**	**3,398,404**	**107.7**	**6,464**	**1,939,991**	**61.5**	**3,691**	**1,458,413**	**46.2**	**2,773**

Post-Closure

				(100 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-21.6	91	0	0	1	271	0	0	0	0	91	64,101	**64,372**	24.0	1,442	**64,210**	24.0	1,438	**162**	0.1	4
February	-21.1	60	0	0	2	648	0	0	0	0	60	42,010	**42,658**	17.6	1,058	**42,269**	17.5	1,048	**389**	0.2	10
March	-12.9	116	0	1	11	3,148	0	0	855	0	116	81,003	**85,007**	31.7	1,904	**82,690**	30.9	1,852	**2,316**	0.9	52
April	-1.4	102	20	6	76	22,482	20	285	1,217,142	20	82	57,158	**1,296,782**	500.3	30,018	**674,722**	260.3	15,619	**622,060**	240.0	14,400
May	3.1	42	41	42	223	66,483	41	176	750,457	41	1	771	**817,711**	305.3	18,318	**402,593**	150.3	9,019	**415,118**	155.0	9,299
June	12.1	96	105	80	31	9,109	105	0	0	105	-9	-6,312	**2,797**	1.1	65	**-2,668**	-1.0	-62	**5,465**	2.1	127
July	12.8	156	112	101	11	3,253	112	35	147,442	112	44	30,508	**181,203**	67.7	4,059	**105,530**	39.4	2,364	**75,673**	28.3	1,695
August	11.8	93	95	87	16	4,884	95	0	0	95	-3	-1,894	**2,991**	1.1	67	**60**	0.0	1	**2,930**	1.1	66
September	8.0	124	60	53	39	11,594	60	62	263,686	60	64	45,166	**320,445**	123.6	7,418	**181,646**	70.1	4,205	**138,799**	53.5	3,213
October	0.2	85	12	14	52	15,487	12	67	287,618	12	73	51,267	**354,372**	132.3	7,938	**201,271**	75.1	4,509	**153,101**	57.2	3,430
November	-8.7	125	0	1	25	7,579	0	6	23,933	0	125	87,526	**119,038**	45.9	2,756	**102,524**	39.6	2,373	**16,514**	6.4	382
December	-20.6	97	0	0	3	749	0	0	0	0	97	67,889	**68,638**	25.6	1,538	**68,188**	25.5	1,528	**450**	0.2	10
Total	***-3.5 (Avg)***	**1185**	**445**	**386**	**490**	**145,687**	**445**	**630**	**2,691,131**	**445**	**740**	**519,194**	**3,356,012**	**106.4**	**6,382**	**1,923,034**	**61.0**	**3,658**	**1,432,978**	**45.4**	**2,724**

Existing Conditions

				(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-28.4	19	0	0	0	0	0	0	0	0	19	15,696	**15,696**	5.9	352	**15,696**	5.9	352	**0**	0.0	0
February	-21.0	35	0	0	0	0	0	0	0	0	35	28,546	**28,546**	11.8	708	**28,546**	11.8	708	**0**	0.0	0
March	-10.7	42	0	0	8	0	0	8	46,918	0	42	33,751	**80,669**	30.1	1,807	**57,210**	21.4	1,282	**23,459**	8.8	526
April	-5.8	31	2	2	24	0	2	24	135,605	2	29	23,178	**158,783**	61.3	3,676	**90,981**	35.1	2,106	**67,803**	26.2	1,570
May	2.9	30	38	37	220	0	38	219	1,254,776	38	-8	-6,587	**1,248,189**	466.0	27,961	**620,801**	231.8	13,907	**627,388**	234.2	14,054
June	9.5	58	89	89	0	0	89	0	0	89	-32	-25,618	**-25,618**	-9.9	-593	**-25,618**	-9.9	-593	**0**	0.0	0
July	13.7	76	117	95	0	0	117	0	0	117	-41	-33,425	**-33,425**	-12.5	-749	**-33,425**	-12.5	-749	**0**	0.0	0
August	13.3	93	104	93	0	0	102	0	0	104	-11	-8,783	**-8,783**	-3.3	-197	**-8,783**	-3.3	-197	**0**	0.0	0
September	6.5	62	51	51	0	0	51	0	0	51	11	8,946	**8,946**	3.5	207	**8,946**	3.5	207	**0**	0.0	0
October	0.6	128	16	15	74	0	16	41	236,880	16	112	91,330	**328,210**	122.5	7,352	**209,770**	78.3	4,699	**118,440**	44.2	2,653
November	-6.9	67	2	2	12	0	2	12	67,516	2	65	53,106	**120,623**	46.5	2,792	**86,865**	33.5	2,011	**33,758**	13.0	781
December	-21.2	35	0	0	0	0	0	0	0	0	35	28,220	**28,220**	10.5	632	**28,220**	10.5	632	**0**	0.0	0
Total	***-3.5 (Avg)***	**675**	**419**	**384**	**337**	**0**	**417**	**304**	**1,741,696**	**419**	**256**	**208,359**	**1,950,055**	**61.0**	**3,662**	**1,079,207**	**33.8**	**2,030**	**870,848**	**27.2**	**1,632**

Phase 1 Mine Development

				(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-28.4	19	0	0	0	0	0	0	0	0	19	15,605	**15,605**	5.8	350	**15,605**	5.8	350	**0**	0.0	0
February	-21.0	35	0	0	0	0	0	0	0	0	35	28,379	**28,379**	11.7	704	**28,379**	11.7	704	**0**	0.0	0
March	-10.7	42	0	0	8	2,440	0	8	40,144	0	42	33,554	**76,137**	28.4	1,706	**54,602**	20.4	1,223	**21,536**	8.0	482
April	-5.8	31	2	2	24	7,051	2	24	116,025	2	29	23,043	**146,119**	56.4	3,382	**83,876**	32.4	1,942	**62,243**	24.0	1,441
May	2.9	30	38	37	220	65,331	38	219	1,073,599	38	-8	-6,549	**1,132,381**	422.8	25,367	**556,383**	207.7	12,464	**575,998**	215.1	12,903
June	9.5	58	89	89	0	0	89	0	0	89	-32	-25,469	**-25,469**	-9.8	-590	**-25,469**	-9.8	-590	**0**	0.0	0
July	13.7	76	117	95	0	0	117	0	0	117	-41	-33,231	**-33,231**	-12.4	-744	**-33,231**	-12.4	-744	**0**	0.0	0
August	13.3	93	104	93	0	0	102	0	0	104	-11	-8,732	**-8,732**	-3.3	-196	**-8,732**	-3.3	-196	**0**	0.0	0
September	6.5	62	51	51	0	0	51	0	0	51	11	8,894	**8,894**	3.4	206	**8,894**	3.4	206	**0**	0.0	0
October	0.6	128	16	15	74	21,985	16	41	202,677	16	112	90,798	**315,460**	117.8	7,067	**200,930**	75.0	4,501	**114,529**	42.8	2,566
November	-6.9	67	2	2	12	3,511	2	12	57,768	2	65	52,797	**114,075**	44.0	2,641	**83,085**	32.1	1,923	**30,990**	12.0	717
December	-21.2	35	0	0	0	0	0	0	0	0	35	28,056	**28,056**	10.5	628	**28,056**	10.5	628	**0**	0.0	0
Total	***-3.5 (Avg)***	**675**	**419**	**384**	**337**	**100,317**	**417**	**304**	**1,490,212**	**419**	**256**	**207,145**	**1,797,674**	**56.3**	**3,377**	**992,378**	**31.1**	**1,868**	**805,296**	**25.2**	**1,509**

Phase 3 Mine Development

				(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-28.4	19	0	0	0	0	0	0	0	0	19	13,536	**13,536**	5.1	303	**13,536**	5.1	303	**0**	0.0	0
February	-21.0	35	0	0	0	0	0	0	0	0	35	24,617	**24,617**	10.2	611	**24,617**	10.2	611	**0**	0.0	0
March	-10.7	42	0	0	8	2,440	0	8	35,044	0	42	29,105	**66,589**	24.9	1,492	**47,603**	17.8	1,066	**18,986**	7.1	425
April	-5.8	31	2	2	24	7,051	2	24	101,286	2	29	19,988	**128,325**	49.5	2,970	**73,451**	28.3	1,700	**54,873**	21.2	1,270
May	2.9	30	38	37	220	65,331	38	219	937,216	38	-8	-5,681	**996,866**	372.2	22,331	**489,060**	182.6	10,956	**507,807**	189.6	11,376
June	9.5	58	89	89	0	0	89	0	0	89	-32	-22,092	**-22,092**	-8.5	-511	**-22,092**	-8.5	-511	**0**	0.0	0
July	13.7	76	117	95	0	0	117	0	0	117	-41	-28,825	**-28,825**	-10.8	-646	**-28,825**	-10.8	-646	**0**	0.0	0
August	13.3	93	104	93	0	0	102	0	0	104	-11	-7,574	**-7,574**	-2.8	-170	**-7,574**	-2.8	-170	**0**	0.0	0
September	6.5	62	51	51	0	0	51	0	0	51	11	7,715	**7,715**	3.0	179	**7,715**	3.0	179	**0**	0.0	0
October	0.6	128	16	15	74	21,985	16	41	176,930	16	112	78,759	**277,674**	103.7	6,220	**176,018**	65.7	3,943	**101,656**	38.0	2,277
November	-6.9	67	2	2	12	3,511	2	12	50,429	2	65	45,797	**99,737**	38.5	2,309	**72,416**	27.9	1,676	**27,321**	10.5	632
December	-21.2	35	0	0	0	0	0	0	0	0	35	24,336	**24,336**	9.1	545	**24,336**	9.1	545	**0**	0.0	0
Total	***-3.5 (Avg)***	**675**	**419**	**384**	**337**	**100,317**	**417**	**304**	**1,300,906**	**419**	**256**	**179,680**	**1,580,903**	**49.5**	**2,969**	**870,260**	**27.3**	**1,638**	**710,643**	**22.2**	**1,332**

Post-Closure

				(100 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-28.4	19	0	0	1	271	0	0	0	0	19	13,536	**13,806**	5.2	309	**13,644**	5.1	306	**162**	0.1	4
February	-21.0	35	0	0	2	648	0	0	0	0	35	24,617	**25,265**	10.4	627	**24,876**	10.3	617	**389**	0.2	10
March	-10.7	42	0	1	11	3,148	0	8	35,044	0	42	29,105	**67,298**	25.1	1,508	**47,887**	17.9	1,073	**19,411**	7.2	435
April	-5.8	31	2	6	76	22,482	2	24	101,286	2	29	19,988	**143,756**	55.5	3,328	**79,624**	30.7	1,843	**64,132**	24.7	1,485
May	2.9	30	38	42	223	66,483	38	219	937,216	38	-8	-5,681	**998,018**	372.6	22,357	**489,520**	182.8	10,966	**508,498**	189.9	11,391
June	9.5	58	89	80	31	9,109	89	0	0	89	-32	-22,092	**-12,983**	-5.0	-301	**-18,448**	-7.1	-427	**5,465**	2.1	127
July	13.7	76	117	101	11	3,253	117	0	0	117	-41	-28,825	**-25,572**	-9.5	-573	**-27,523**	-10.3	-617	**1,952**	0.7	44
August	13.3	93	104	87	16	4,884	102	0	0	104	-11	-7,574	**-2,690**	-1.0	-60	**-5,621**	-2.1	-126	**2,930**	1.1	66
September	6.5	62	51	53	39	11,594	51	0	0	51	11	7,715	**19,309**	7.4	447	**12,352**	4.8	286	**6,956**	2.7	161
October	0.6	128	16	14	52	15,487	16	41	176,930	16	112	78,759	**271,176**	101.2	6,075	**173,419**	64.7	3,885	**97,757**	36.5	2,190
November	-6.9	67	2	1	25	7,579	2	12	50,429	2	65	45,797	**103,805**	40.0	2,403	**74,043**	28.6	1,714	**29,762**	11.5	689
December	-21.2	35	0	0	3	749	0	0	0	0	35	24,336	**25,086**	9.4	562	**24,636**	9.2	552	**450**	0.2	10
Total	***-3.5 (Avg)***	**675**	**419**	**386**	**490**	**145,687**	**417**	**304**	**1,300,906**	**419**	**256**	**179,680**	**1,626,273**	**50.9**	**3,057**	**888,408**	**27.9**	**1,673**	**737,865**	**23.1**	**1,384**

Table A.10:
Water Balance for White Lake (Average Year)

Existing Conditions

				(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	**Temperature (°C)**	**Precipitation (mm)**	**Potential Evapotranspiration (mm)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Potential Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Total Surplus (m^3)**	**Average Surplus (Runoff and Infiltration) (L/s)**	**Average Surplus (Runoff and Infiltration) (L/min)**	**Total Runoff (m^3)**	**Average Runoff (L/s)**	**Average Runoff (L/min)**	**Total Infiltration (m^3)**	**Average Infiltration (L/s)**	**Average Infiltration (L/min)**
January	-22.0	56	0	0	1	0	0	1	2,325	0	56	43,815	**46,141**	17.2	1,034	**44,978**	16.8	1,008	**1,163**	0.4	26
February	-20.4	43	0	0	2	0	0	2	5,569	0	43	33,292	**38,861**	16.1	964	**36,076**	14.9	895	**2,785**	1.2	69
March	-13.5	56	1	1	10	0	1	10	25,354	1	55	42,927	**68,282**	25.5	1,530	**55,604**	20.8	1,246	**12,677**	4.7	284
April	-4.6	53	6	6	76	0	6	74	190,156	6	47	36,321	**226,477**	87.4	5,243	**131,399**	50.7	3,042	**95,078**	36.7	2,201
May	3.5	57	42	42	224	0	42	223	569,775	42	15	11,317	**581,092**	217.0	13,017	**296,205**	110.6	6,635	**284,887**	106.4	6,382
June	10.3	86	93	93	29	0	93	31	78,260	93	-7	-5,669	**72,590**	28.0	1,680	**33,461**	12.9	775	**39,130**	15.1	906
July	13.7	112	118	113	9	0	118	8	21,545	118	-6	-4,591	**16,954**	6.3	380	**6,182**	2.3	138	**10,772**	4.0	241
August	12.4	103	99	92	8	0	98	7	18,895	99	5	3,783	**22,679**	8.5	508	**13,231**	4.9	296	**9,448**	3.5	212
September	7.1	94	54	53	27	0	54	23	58,647	54	40	31,181	**89,828**	34.7	2,079	**60,504**	23.3	1,401	**29,323**	11.3	679
October	0.1	79	14	14	46	0	14	40	101,820	14	65	50,526	**152,345**	56.9	3,413	**101,436**	37.9	2,272	**50,910**	19.0	1,140
November	-7.8	75	1	1	26	0	1	24	62,083	1	73	57,313	**119,395**	46.1	2,764	**88,354**	34.1	2,045	**31,041**	12.0	719
December	-17.7	64	0	0	2	0	0	2	5,004	0	64	49,671	**54,675**	20.4	1,225	**52,173**	19.5	1,169	**2,502**	0.9	56
Total	***-3.3 (Avg)***	**877**	**429**	**416**	**460**	**0**	**429**	**446**	**1,139,432**	**429**	**449**	**349,886**	**1,489,318**	**47.0**	**2,820**	**919,602**	**29.1**	**1,743**	**569,716**	**17.9**	**1,076**

Phase 1 Mine Development

				(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	**Temperature (°C)**	**Precipitation (mm)**	**Potential Evapotranspiration (mm)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Potential Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Total Surplus (m^3)**	**Average Surplus (Runoff and Infiltration) (L/s)**	**Average Surplus (Runoff and Infiltration) (L/min)**	**Total Runoff (m^3)**	**Average Runoff (L/s)**	**Average Runoff (L/min)**	**Total Infiltration (m^3)**	**Average Infiltration (L/s)**	**Average Infiltration (L/min)**
January	-22.0	56	0	0	1	321	0	1	2,004	0	56	43,815	**46,141**	17.2	1,034	**44,946**	16.8	1,007	**1,195**	0.4	27
February	-20.4	43	0	0	2	770	0	2	4,799	0	43	33,292	**38,861**	16.1	964	**35,999**	14.9	893	**2,862**	1.2	71
March	-13.5	56	1	1	10	3,643	1	10	21,850	1	55	42,927	**68,420**	25.5	1,533	**55,309**	20.7	1,239	**13,111**	4.9	294
April	-4.6	53	6	6	76	26,693	6	74	163,872	6	47	36,321	**226,886**	87.5	5,252	**128,934**	49.7	2,985	**97,952**	37.8	2,267
May	3.5	57	42	42	224	79,277	42	223	491,020	42	15	11,317	**581,615**	217.2	13,029	**288,538**	107.7	6,464	**293,076**	109.4	6,565
June	10.3	86	93	93	29	10,208	93	31	67,443	93	-7	-5,669	**71,982**	27.8	1,666	**32,135**	12.4	744	**39,846**	15.4	922
July	13.7	112	118	113	9	3,049	118	8	18,567	118	-6	-4,591	**17,025**	6.4	381	**5,912**	2.2	132	**11,112**	4.1	249
August	12.4	103	99	92	8	2,839	98	7	16,283	99	5	3,783	**22,906**	8.6	513	**13,061**	4.9	293	**9,845**	3.7	221
September	7.1	94	54	53	27	9,461	54	23	50,541	54	40	31,181	**91,183**	35.2	2,111	**60,236**	23.2	1,394	**30,947**	11.9	716
October	0.1	79	14	14	46	16,288	14	40	87,746	14	65	50,526	**154,560**	57.7	3,462	**100,914**	37.7	2,261	**53,646**	20.0	1,202
November	-7.8	75	1	1	26	9,337	1	24	53,502	1	73	57,313	**120,151**	46.4	2,781	**87,798**	33.9	2,032	**32,353**	12.5	749
December	-17.7	64	0	0	2	748	0	2	4,312	0	64	49,671	**54,731**	20.4	1,226	**52,126**	19.5	1,168	**2,605**	1.0	58
Total	***-3.3 (Avg)***	**877**	**429**	**416**	**460**	**162,634**	**429**	**446**	**981,939**	**429**	**449**	**349,886**	**1,494,459**	**47.2**	**2,829**	**905,909**	**28.6**	**1,718**	**588,550**	**18.5**	**1,112**

Table A.10:
Water Balance for White Lake (Average Year)

Phase 3 Mine Development

				(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	**Temperature (°C)**	**Precipitation (mm)**	**Potential Evapotranspiration (mm)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Potential Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Total Surplus (m^3)**	**Average Surplus (Runoff and Infiltration) (L/s)**	**Average Surplus (Runoff and Infiltration) (L/min)**	**Total Runoff (m^3)**	**Average Runoff (L/s)**	**Average Runoff (L/min)**	**Total Infiltration (m^3)**	**Average Infiltration (L/s)**	**Average Infiltration (L/min)**
January	-22.0	56	0	0	1	321	0	1	2,004	0	56	43,815	**46,141**	17.2	1,034	**44,946**	16.8	1,007	**1,195**	0.4	27
February	-20.4	43	0	0	2	770	0	2	4,799	0	43	33,292	**38,861**	16.1	964	**35,999**	14.9	893	**2,862**	1.2	71
March	-13.5	56	1	1	10	3,643	1	10	21,850	1	55	42,927	**68,420**	25.5	1,533	**55,309**	20.7	1,239	**13,111**	4.9	294
April	-4.6	53	6	6	76	26,693	6	74	163,872	6	47	36,321	**226,886**	87.5	5,252	**128,934**	49.7	2,985	**97,952**	37.8	2,267
May	3.5	57	42	42	224	79,277	42	223	491,020	42	15	11,317	**581,615**	217.2	13,029	**288,538**	107.7	6,464	**293,076**	109.4	6,565
June	10.3	86	93	93	29	10,208	93	31	67,443	93	-7	-5,669	**71,982**	27.8	1,666	**32,135**	12.4	744	**39,846**	15.4	922
July	13.7	112	118	113	9	3,049	118	8	18,567	118	-6	-4,591	**17,025**	6.4	381	**5,912**	2.2	132	**11,112**	4.1	249
August	12.4	103	99	92	8	2,839	98	7	16,283	99	5	3,783	**22,906**	8.6	513	**13,061**	4.9	293	**9,845**	3.7	221
September	7.1	94	54	53	27	9,461	54	23	50,541	54	40	31,181	**91,183**	35.2	2,111	**60,236**	23.2	1,394	**30,947**	11.9	716
October	0.1	79	14	14	46	16,288	14	40	87,746	14	65	50,526	**154,560**	57.7	3,462	**100,914**	37.7	2,261	**53,646**	20.0	1,202
November	-7.8	75	1	1	26	9,337	1	24	53,502	1	73	57,313	**120,151**	46.4	2,781	**87,798**	33.9	2,032	**32,353**	12.5	749
December	-17.7	64	0	0	2	748	0	2	4,312	0	64	49,671	**54,731**	20.4	1,226	**52,126**	19.5	1,168	**2,605**	1.0	58
Total	***-3.3 (Avg)***	**877**	**429**	**416**	**460**	**162,634**	**429**	**446**	**981,939**	**429**	**449**	**349,886**	**1,494,459**	**47.2**	**2,829**	**905,909**	**28.6**	**1,718**	**588,550**	**18.5**	**1,112**

Post-Closure

				(100 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	**Temperature (°C)**	**Precipitation (mm)**	**Potential Evapotranspiration (mm)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Potential Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Total Surplus (m^3)**	**Average Surplus (Runoff and Infiltration) (L/s)**	**Average Surplus (Runoff and Infiltration) (L/min)**	**Total Runoff (m^3)**	**Average Runoff (L/s)**	**Average Runoff (L/min)**	**Total Infiltration (m^3)**	**Average Infiltration (L/s)**	**Average Infiltration (L/min)**
January	-22.0	56	0	0	1	298	0	1	2,004	0	56	43,815	**46,118**	17.2	1,033	**44,937**	16.8	1,007	**1,181**	0.4	26
February	-20.4	43	0	0	2	649	0	2	4,799	0	43	33,292	**38,741**	16.0	961	**35,951**	14.9	892	**2,789**	1.2	69
March	-13.5	56	1	1	10	3,701	1	10	21,850	1	55	42,927	**68,478**	25.6	1,534	**55,332**	20.7	1,240	**13,145**	4.9	294
April	-4.6	53	6	6	71	25,070	6	74	163,872	6	47	36,321	**225,263**	86.9	5,214	**128,285**	49.5	2,970	**96,978**	37.4	2,245
May	3.5	57	42	42	225	79,570	42	223	491,020	42	15	11,317	**581,907**	217.3	13,036	**288,655**	107.8	6,466	**293,252**	109.5	6,569
June	10.3	86	93	92	33	11,746	93	31	67,443	93	-7	-5,669	**73,519**	28.4	1,702	**32,751**	12.6	758	**40,769**	15.7	944
July	13.7	112	118	117	9	3,050	118	8	18,567	118	-6	-4,591	**17,026**	6.4	381	**5,913**	2.2	132	**11,113**	4.1	249
August	12.4	103	99	96	6	2,092	98	7	16,283	99	5	3,783	**22,159**	8.3	496	**12,762**	4.8	286	**9,397**	3.5	211
September	7.1	94	54	53	23	8,250	54	23	50,541	54	40	31,181	**89,972**	34.7	2,083	**59,751**	23.1	1,383	**30,220**	11.7	700
October	0.1	79	14	13	39	13,842	14	40	87,746	14	65	50,526	**152,114**	56.8	3,408	**99,936**	37.3	2,239	**52,178**	19.5	1,169
November	-7.8	75	1	1	22	7,679	1	24	53,502	1	73	57,313	**118,494**	45.7	2,743	**87,135**	33.6	2,017	**31,358**	12.1	726
December	-17.7	64	0	0	0	159	0	2	4,312	0	64	49,671	**54,142**	20.2	1,213	**51,891**	19.4	1,162	**2,252**	0.8	50
Total	***-3.3 (Avg)***	**877**	**429**	**422**	**442**	**156,107**	**429**	**446**	**981,939**	**429**	**449**	**349,886**	**1,487,932**	**46.9**	**2,817**	**903,298**	**28.5**	**1,713**	**584,633**	**18.4**	**1,104**

Table A.11:
Water Balance for White Lake (Wet Year)

Existing Conditions

				(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-21.6	91	0	0	0	0	0	0	0	0	91	71,300	**71,300**	26.6	1,597	**71,300**	26.6	1,597	**0**	0.0	0
February	-21.1	60	0	0	0	0	0	0	0	0	60	46,727	**46,727**	19.3	1,159	**46,727**	19.3	1,159	**0**	0.0	0
March	-12.9	116	0	0	0	0	0	0	511	0	116	90,100	**90,611**	33.8	2,030	**90,356**	33.7	2,024	**256**	0.1	6
April	-1.4	102	20	20	285	0	20	285	727,965	20	82	63,577	**791,543**	305.4	18,323	**427,560**	165.0	9,897	**363,983**	140.4	8,426
May	3.1	42	41	41	176	0	41	176	448,844	41	1	858	**449,702**	167.9	10,074	**225,280**	84.1	5,047	**224,422**	83.8	5,027
June	12.1	96	105	104	0	0	105	0	0	105	-9	-7,021	**-7,021**	-2.7	-163	**-7,021**	-2.7	-163	**0**	0.0	0
July	12.8	156	112	112	36	0	112	35	88,184	112	44	33,934	**122,118**	45.6	2,736	**78,026**	29.1	1,748	**44,092**	16.5	988
August	11.8	93	95	95	0	0	95	0	0	95	-3	-2,106	**-2,106**	-0.8	-47	**-2,106**	-0.8	-47	**0**	0.0	0
September	8.0	124	60	59	63	0	60	62	157,709	60	64	50,238	**207,947**	80.2	4,814	**129,092**	49.8	2,988	**78,854**	30.4	1,825
October	0.2	85	12	12	67	0	12	67	172,023	12	73	57,025	**229,047**	85.5	5,131	**143,036**	53.4	3,204	**86,011**	32.1	1,927
November	-8.7	125	0	0	6	0	0	6	14,314	0	125	97,355	**111,669**	43.1	2,585	**104,512**	40.3	2,419	**7,157**	2.8	166
December	-20.6	97	0	0	0	0	0	0	0	0	97	75,513	**75,513**	28.2	1,692	**75,513**	28.2	1,692	**0**	0.0	0
Total	***-3.5 (Avg)***	**1185**	**445**	**442**	**632**	**0**	**445**	**630**	**1,609,550**	**445**	**740**	**577,500**	**2,187,050**	**69.3**	**4,161**	**1,382,275**	**43.8**	**2,630**	**804,775**	**25.5**	**1,530**

Phase 1 Mine Development

				(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-21.6	91	0	0	0	0	0	0	0	0	91	71,300	**71,300**	26.6	1,597	**71,300**	26.6	1,597	**0**	0.0	0
February	-21.1	60	0	0	0	0	0	0	0	0	60	46,727	**46,727**	19.3	1,159	**46,727**	19.3	1,159	**0**	0.0	0
March	-12.9	116	0	0	0	71	0	0	441	0	116	90,100	**90,611**	33.8	2,030	**90,349**	33.7	2,024	**263**	0.1	6
April	-1.4	102	20	20	285	100,691	20	285	627,346	20	82	63,577	**791,613**	305.4	18,324	**417,526**	161.1	9,665	**374,087**	144.3	8,659
May	3.1	42	41	41	176	62,145	41	176	386,804	41	1	858	**449,808**	167.9	10,076	**219,118**	81.8	4,909	**230,689**	86.1	5,168
June	12.1	96	105	104	0	0	105	0	0	105	-9	-7,021	**-7,021**	-2.7	-163	**-7,021**	-2.7	-163	**0**	0.0	0
July	12.8	156	112	112	36	12,542	112	35	75,995	112	44	33,934	**122,471**	45.7	2,744	**76,948**	28.7	1,724	**45,523**	17.0	1,020
August	11.8	93	95	95	0	0	95	0	0	95	-3	-2,106	**-2,106**	-0.8	-47	**-2,106**	-0.8	-47	**0**	0.0	0
September	8.0	124	60	59	63	22,117	60	62	135,910	60	64	50,238	**208,264**	80.3	4,821	**127,039**	49.0	2,941	**81,225**	31.3	1,880
October	0.2	85	12	12	67	23,812	12	67	148,246	12	73	57,025	**229,083**	85.5	5,132	**140,672**	52.5	3,151	**88,410**	33.0	1,981
November	-8.7	125	0	0	6	1,978	0	6	12,335	0	125	97,355	**111,669**	43.1	2,585	**104,314**	40.2	2,415	**7,355**	2.8	170
December	-20.6	97	0	0	0	0	0	0	0	0	97	75,513	**75,513**	28.2	1,692	**75,513**	28.2	1,692	**0**	0.0	0
Total	***-3.5 (Avg)***	**1185**	**445**	**442**	**632**	**223,356**	**445**	**630**	**1,387,077**	**445**	**740**	**577,500**	**2,187,933**	**69.4**	**4,162**	**1,360,381**	**43.1**	**2,589**	**827,552**	**26.2**	**1,574**

Table A.11:
Water Balance for White Lake (Wet Year)

Phase 3 Mine Development

				(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-21.6	91	0	0	0	0	0	0	0	0	91	71,300	**71,300**	26.6	1,597	**71,300**	26.6	1,597	**0**	0.0	0
February	-21.1	60	0	0	0	0	0	0	0	0	60	46,727	**46,727**	19.3	1,159	**46,727**	19.3	1,159	**0**	0.0	0
March	-12.9	116	0	0	0	71	0	0	441	0	116	90,100	**90,611**	33.8	2,030	**90,349**	33.7	2,024	**263**	0.1	6
April	-1.4	102	20	20	285	100,691	20	285	627,346	20	82	63,577	**791,613**	305.4	18,324	**417,526**	161.1	9,665	**374,087**	144.3	8,659
May	3.1	42	41	41	176	62,145	41	176	386,804	41	1	858	**449,808**	167.9	10,076	**219,118**	81.8	4,909	**230,689**	86.1	5,168
June	12.1	96	105	104	0	0	105	0	0	105	-9	-7,021	**-7,021**	-2.7	-163	**-7,021**	-2.7	-163	**0**	0.0	0
July	12.8	156	112	112	36	12,542	112	35	75,995	112	44	33,934	**122,471**	45.7	2,744	**76,948**	28.7	1,724	**45,523**	17.0	1,020
August	11.8	93	95	95	0	0	95	0	0	95	-3	-2,106	**-2,106**	-0.8	-47	**-2,106**	-0.8	-47	**0**	0.0	0
September	8.0	124	60	59	63	22,117	60	62	135,910	60	64	50,238	**208,264**	80.3	4,821	**127,039**	49.0	2,941	**81,225**	31.3	1,880
October	0.2	85	12	12	67	23,812	12	67	148,246	12	73	57,025	**229,083**	85.5	5,132	**140,672**	52.5	3,151	**88,410**	33.0	1,981
November	-8.7	125	0	0	6	1,978	0	6	12,335	0	125	97,355	**111,669**	43.1	2,585	**104,314**	40.2	2,415	**7,355**	2.8	170
December	-20.6	97	0	0	0	0	0	0	0	0	97	75,513	**75,513**	28.2	1,692	**75,513**	28.2	1,692	**0**	0.0	0
Total	***-3.5 (Avg)***	**1185**	**445**	**442**	**632**	**223,356**	**445**	**630**	**1,387,077**	**445**	**740**	**577,500**	**2,187,933**	**69.4**	**4,162**	**1,360,381**	**43.1**	**2,589**	**827,552**	**26.2**	**1,574**

Post-Closure

				(100 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-21.6	91	0	0	0	0	0	0	0	0	91	71,300	**71,300**	26.6	1,597	**71,300**	26.6	1,597	**0**	0.0	0
February	-21.1	60	0	0	0	0	0	0	0	0	60	46,727	**46,727**	19.3	1,159	**46,727**	19.3	1,159	**0**	0.0	0
March	-12.9	116	0	0	0	71	0	0	441	0	116	90,100	**90,611**	33.8	2,030	**90,349**	33.7	2,024	**263**	0.1	6
April	-1.4	102	20	20	285	100,620	20	285	627,346	20	82	63,577	**791,543**	305.4	18,323	**417,498**	161.1	9,664	**374,045**	144.3	8,658
May	3.1	42	41	41	176	62,039	41	176	386,804	41	1	858	**449,702**	167.9	10,074	**219,076**	81.8	4,908	**230,626**	86.1	5,166
June	12.1	96	105	105	0	0	105	0	0	105	-9	-7,021	**-7,021**	-2.7	-163	**-7,021**	-2.7	-163	**0**	0.0	0
July	12.8	156	112	112	35	12,189	112	35	75,995	112	44	33,934	**122,118**	45.6	2,736	**76,807**	28.7	1,721	**45,311**	16.9	1,015
August	11.8	93	95	95	0	0	95	0	0	95	-3	-2,106	**-2,106**	-0.8	-47	**-2,106**	-0.8	-47	**0**	0.0	0
September	8.0	124	60	60	62	21,799	60	62	135,910	60	64	50,238	**207,947**	80.2	4,814	**126,912**	49.0	2,938	**81,034**	31.3	1,876
October	0.2	85	12	12	67	23,777	12	67	148,246	12	73	57,025	**229,047**	85.5	5,131	**140,658**	52.5	3,151	**88,389**	33.0	1,980
November	-8.7	125	0	0	6	1,978	0	6	12,335	0	125	97,355	**111,669**	43.1	2,585	**104,314**	40.2	2,415	**7,355**	2.8	170
December	-20.6	97	0	0	0	0	0	0	0	0	97	75,513	**75,513**	28.2	1,692	**75,513**	28.2	1,692	**0**	0.0	0
Total	***-3.5 (Avg)***	**1185**	**445**	**445**	**630**	**222,473**	**445**	**630**	**1,387,077**	**445**	**740**	**577,500**	**2,187,050**	**69.3**	**4,161**	**1,360,027**	**43.1**	**2,588**	**827,022**	**26.2**	**1,573**

Table A.12:
Water Balance for White Lake (Dry Year)

Existing Conditions

				(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	**Temperature (°C)**	**Precipitation (mm)**	**Potential Evapotranspiration (mm)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Potential Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Total Surplus (m^3)**	**Average Surplus (Runoff and Infiltration) (L/s)**	**Average Surplus (Runoff and Infiltration) (L/min)**	**Total Runoff (m^3)**	**Average Runoff (L/s)**	**Average Runoff (L/min)**	**Total Infiltration (m^3)**	**Average Infiltration (L/s)**	**Average Infiltration (L/min)**
January	-28.4	19	0	0	0	0	0	0	0	0	19	15,056	**15,056**	5.6	337	**15,056**	5.6	337	**0**	0.0	0
February	-21.0	35	0	0	0	0	0	0	0	0	35	27,381	**27,381**	11.3	679	**27,381**	11.3	679	**0**	0.0	0
March	-10.7	42	0	0	8	0	0	8	20,960	0	42	32,374	**53,333**	19.9	1,195	**42,854**	16.0	960	**10,480**	3.9	235
April	-5.8	31	2	2	24	0	2	24	60,579	2	29	22,233	**82,811**	31.9	1,917	**52,522**	20.3	1,216	**30,289**	11.7	701
May	2.9	30	38	37	220	0	38	219	560,544	38	-8	-6,319	**554,225**	206.9	12,415	**273,953**	102.3	6,137	**280,272**	104.6	6,278
June	9.5	58	89	89	0	0	89	0	0	89	-32	-24,573	**-24,573**	-9.5	-569	**-24,573**	-9.5	-569	**0**	0.0	0
July	13.7	76	117	95	0	0	117	0	0	117	-41	-32,062	**-32,062**	-12.0	-718	**-32,062**	-12.0	-718	**0**	0.0	0
August	13.3	93	104	93	0	0	102	0	0	104	-11	-8,425	**-8,425**	-3.1	-189	**-8,425**	-3.1	-189	**0**	0.0	0
September	6.5	62	51	51	0	0	51	0	0	51	11	8,581	**8,581**	3.3	199	**8,581**	3.3	199	**0**	0.0	0
October	0.6	128	16	15	74	0	16	41	105,821	16	112	87,604	**193,425**	72.2	4,333	**140,514**	52.5	3,148	**52,910**	19.8	1,185
November	-6.9	67	2	2	12	0	2	12	30,161	2	65	50,940	**81,101**	31.3	1,877	**66,021**	25.5	1,528	**15,081**	5.8	349
December	-21.2	35	0	0	0	0	0	0	0	0	35	27,069	**27,069**	10.1	606	**27,069**	10.1	606	**0**	0.0	0
Total	***-3.5 (Avg)***	**675**	**419**	**384**	**337**	**0**	**417**	**304**	**778,064**	**419**	**256**	**199,859**	**977,923**	**30.7**	**1,840**	**588,891**	**18.5**	**1,111**	**389,032**	**12.2**	**729**

Phase 1 Mine Development

				(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	**Temperature (°C)**	**Precipitation (mm)**	**Potential Evapotranspiration (mm)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Potential Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Total Surplus (m^3)**	**Average Surplus (Runoff and Infiltration) (L/s)**	**Average Surplus (Runoff and Infiltration) (L/min)**	**Total Runoff (m^3)**	**Average Runoff (L/s)**	**Average Runoff (L/min)**	**Total Infiltration (m^3)**	**Average Infiltration (L/s)**	**Average Infiltration (L/min)**
January	-28.4	19	0	0	0	0	0	0	0	0	19	15,056	**15,056**	5.6	337	**15,056**	5.6	337	**0**	0.0	0
February	-21.0	35	0	0	0	0	0	0	0	0	35	27,381	**27,381**	11.3	679	**27,381**	11.3	679	**0**	0.0	0
March	-10.7	42	0	0	8	2,897	0	8	18,063	0	42	32,374	**53,333**	19.9	1,195	**42,564**	15.9	953	**10,770**	4.0	241
April	-5.8	31	2	2	24	8,373	2	24	52,205	2	29	22,233	**82,811**	31.9	1,917	**51,685**	19.9	1,196	**31,127**	12.0	721
May	2.9	30	38	37	220	77,585	38	219	483,065	38	-8	-6,319	**554,331**	207.0	12,418	**266,248**	99.4	5,964	**288,083**	107.6	6,453
June	9.5	58	89	89	0	0	89	0	0	89	-32	-24,573	**-24,573**	-9.5	-569	**-24,573**	-9.5	-569	**0**	0.0	0
July	13.7	76	117	95	0	0	117	0	0	117	-41	-32,062	**-32,062**	-12.0	-718	**-32,062**	-12.0	-718	**0**	0.0	0
August	13.3	93	104	93	0	0	102	0	0	104	-11	-8,425	**-8,425**	-3.1	-189	**-8,425**	-3.1	-189	**0**	0.0	0
September	6.5	62	51	51	0	0	51	0	0	51	11	8,581	**8,581**	3.3	199	**8,581**	3.3	199	**0**	0.0	0
October	0.6	128	16	15	74	26,109	16	41	91,194	16	112	87,604	**204,907**	76.5	4,590	**143,645**	53.6	3,218	**61,262**	22.9	1,372
November	-6.9	67	2	2	12	4,169	2	12	25,993	2	65	50,940	**81,101**	31.3	1,877	**65,604**	25.3	1,519	**15,498**	6.0	359
December	-21.2	35	0	0	0	0	0	0	0	0	35	27,069	**27,069**	10.1	606	**27,069**	10.1	606	**0**	0.0	0
Total	***-3.5 (Avg)***	**675**	**419**	**384**	**337**	**119,133**	**417**	**304**	**670,520**	**419**	**256**	**199,859**	**989,511**	**31.0**	**1,862**	**582,772**	**18.3**	**1,100**	**406,739**	**12.7**	**762**

Table A.12:
Water Balance for White Lake (Dry Year)

Phase 3 Mine Development

				(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	**Temperature (°C)**	**Precipitation (mm)**	**Potential Evapotranspiration (mm)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Potential Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Total Surplus (m^3)**	**Average Surplus (Runoff and Infiltration) (L/s)**	**Average Surplus (Runoff and Infiltration) (L/min)**	**Total Runoff (m^3)**	**Average Runoff (L/s)**	**Average Runoff (L/min)**	**Total Infiltration (m^3)**	**Average Infiltration (L/s)**	**Average Infiltration (L/min)**
January	-28.4	19	0	0	0	0	0	0	0	0	19	15,056	**15,056**	5.6	337	**15,056**	5.6	337	**0**	0.0	0
February	-21.0	35	0	0	0	0	0	0	0	0	35	27,381	**27,381**	11.3	679	**27,381**	11.3	679	**0**	0.0	0
March	-10.7	42	0	0	8	2,897	0	8	18,063	0	42	32,374	**53,333**	19.9	1,195	**42,564**	15.9	953	**10,770**	4.0	241
April	-5.8	31	2	2	24	8,373	2	24	52,205	2	29	22,233	**82,811**	31.9	1,917	**51,685**	19.9	1,196	**31,127**	12.0	721
May	2.9	30	38	37	220	77,585	38	219	483,065	38	-8	-6,319	**554,331**	207.0	12,418	**266,248**	99.4	5,964	**288,083**	107.6	6,453
June	9.5	58	89	89	0	0	89	0	0	89	-32	-24,573	**-24,573**	-9.5	-569	**-24,573**	-9.5	-569	**0**	0.0	0
July	13.7	76	117	95	0	0	117	0	0	117	-41	-32,062	**-32,062**	-12.0	-718	**-32,062**	-12.0	-718	**0**	0.0	0
August	13.3	93	104	93	0	0	102	0	0	104	-11	-8,425	**-8,425**	-3.1	-189	**-8,425**	-3.1	-189	**0**	0.0	0
September	6.5	62	51	51	0	0	51	0	0	51	11	8,581	**8,581**	3.3	199	**8,581**	3.3	199	**0**	0.0	0
October	0.6	128	16	15	74	26,109	16	41	91,194	16	112	87,604	**204,907**	76.5	4,590	**143,645**	53.6	3,218	**61,262**	22.9	1,372
November	-6.9	67	2	2	12	4,169	2	12	25,993	2	65	50,940	**81,101**	31.3	1,877	**65,604**	25.3	1,519	**15,498**	6.0	359
December	-21.2	35	0	0	0	0	0	0	0	0	35	27,069	**27,069**	10.1	606	**27,069**	10.1	606	**0**	0.0	0
Total	***-3.5 (Avg)***	**675**	**419**	**384**	**337**	**119,133**	**417**	**304**	**670,520**	**419**	**256**	**199,859**	**989,511**	**31.0**	**1,862**	**582,772**	**18.3**	**1,100**	**406,739**	**12.7**	**762**

Post-Closure

				(100 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			(150 mm Water Hold Capacity) Wooded Areas (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	**Temperature (°C)**	**Precipitation (mm)**	**Potential Evapotranspiration (mm)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Potential Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Total Surplus (m^3)**	**Average Surplus (Runoff and Infiltration) (L/s)**	**Average Surplus (Runoff and Infiltration) (L/min)**	**Total Runoff (m^3)**	**Average Runoff (L/s)**	**Average Runoff (L/min)**	**Total Infiltration (m^3)**	**Average Infiltration (L/s)**	**Average Infiltration (L/min)**
January	-28.4	19	0	0	0	0	0	0	0	0	19	15,056	**15,056**	5.6	337	**15,056**	5.6	337	**0**	0.0	0
February	-21.0	35	0	0	0	0	0	0	0	0	35	27,381	**27,381**	11.3	679	**27,381**	11.3	679	**0**	0.0	0
March	-10.7	42	0	0	8	2,897	0	8	18,063	0	42	32,374	**53,333**	19.9	1,195	**42,564**	15.9	953	**10,770**	4.0	241
April	-5.8	31	2	2	24	8,373	2	24	52,205	2	29	22,233	**82,811**	31.9	1,917	**51,685**	19.9	1,196	**31,127**	12.0	721
May	2.9	30	38	38	219	77,479	38	219	483,065	38	-8	-6,319	**554,225**	206.9	12,415	**266,205**	99.4	5,963	**288,020**	107.5	6,452
June	9.5	58	89	89	0	0	89	0	0	89	-32	-24,573	**-24,573**	-9.5	-569	**-24,573**	-9.5	-569	**0**	0.0	0
July	13.7	76	117	117	0	0	117	0	0	117	-41	-32,062	**-32,062**	-12.0	-718	**-32,062**	-12.0	-718	**0**	0.0	0
August	13.3	93	104	98	0	0	102	0	0	104	-11	-8,425	**-8,425**	-3.1	-189	**-8,425**	-3.1	-189	**0**	0.0	0
September	6.5	62	51	51	0	0	51	0	0	51	11	8,581	**8,581**	3.3	199	**8,581**	3.3	199	**0**	0.0	0
October	0.6	128	16	16	46	16,181	16	41	91,194	16	112	87,604	**194,979**	72.8	4,368	**139,674**	52.1	3,129	**55,306**	20.6	1,239
November	-6.9	67	2	2	12	4,169	2	12	25,993	2	65	50,940	**81,101**	31.3	1,877	**65,604**	25.3	1,519	**15,498**	6.0	359
December	-21.2	35	0	0	0	0	0	0	0	0	35	27,069	**27,069**	10.1	606	**27,069**	10.1	606	**0**	0.0	0
Total	***-3.5 (Avg)***	**675**	**419**	**413**	**309**	**109,099**	**417**	**304**	**670,520**	**419**	**256**	**199,859**	**979,477**	**30.7**	**1,843**	**578,758**	**18.2**	**1,092**	**400,719**	**12.5**	**751**

Table A.13:
Water Balance for Wabush 3 Pit (Average Year)

Phase 1 Mine Development

				(40 mm Water Holding Capacity) Pits and Roads (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-22.0	56	0	0	1	1,439	0	56	764	**2,203**	0.8	49	**2,203**	0.8	49	**0**	0.0	0
February	-20.4	43	0	0	2	3,447	0	43	580	**4,027**	1.7	100	**4,027**	1.7	100	**0**	0.0	0
March	-13.5	56	1	1	10	16,312	1	55	748	**17,061**	6.4	382	**17,061**	6.4	382	**0**	0.0	0
April	-4.6	53	6	6	76	119,644	6	47	633	**120,277**	46.4	2,784	**120,277**	46.4	2,784	**0**	0.0	0
May	3.5	57	42	42	225	355,211	42	15	197	**355,408**	132.7	7,962	**355,408**	132.7	7,962	**0**	0.0	0
June	10.3	86	93	91	29	45,709	93	-7	-99	**45,610**	17.6	1,056	**45,610**	17.6	1,056	**0**	0.0	0
July	13.7	112	118	112	9	13,650	118	-6	-80	**13,570**	5.1	304	**13,570**	5.1	304	**0**	0.0	0
August	12.4	103	99	91	9	13,997	99	5	66	**14,063**	5.3	315	**14,063**	5.3	315	**0**	0.0	0
September	7.1	94	54	53	29	45,478	54	40	544	**46,021**	17.8	1,065	**46,021**	17.8	1,065	**0**	0.0	0
October	0.1	79	14	14	47	74,957	14	65	881	**75,838**	28.3	1,699	**75,838**	28.3	1,699	**0**	0.0	0
November	-7.8	75	1	1	27	42,320	1	73	999	**43,319**	16.7	1,003	**43,319**	16.7	1,003	**0**	0.0	0
December	-17.7	64	0	0	2	3,538	0	64	866	**4,404**	1.6	99	**4,404**	1.6	99	**0**	0.0	0
Total	***-3.3 (Avg)***	**877**	**429**	**411**	**465**	**735,702**	**429**	**449**	**6,100**	**741,802**	**23.4**	**1,401**	**741,802**	**23.4**	**1,401**	**0**	**0.0**	**0**

Phase 3 Mine Development

				(40 mm Water Holding Capacity) Pits and Roads (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-22.0	56	0	0	1	2,260	0	56	764	**3,024**	1.1	68	**3,024**	1.1	68	**0**	0.0	0
February	-20.4	43	0	0	2	5,414	0	43	580	**5,995**	2.5	149	**5,995**	2.5	149	**0**	0.0	0
March	-13.5	56	1	1	10	25,624	1	55	748	**26,373**	9.8	591	**26,373**	9.8	591	**0**	0.0	0
April	-4.6	53	6	6	76	187,942	6	47	633	**188,576**	72.8	4,365	**188,576**	72.8	4,365	**0**	0.0	0
May	3.5	57	42	42	225	557,983	42	15	197	**558,180**	208.4	12,504	**558,180**	208.4	12,504	**0**	0.0	0
June	10.3	86	93	91	29	71,802	93	-7	-99	**71,703**	27.7	1,660	**71,703**	27.7	1,660	**0**	0.0	0
July	13.7	112	118	112	9	21,443	118	-6	-80	**21,363**	8.0	479	**21,363**	8.0	479	**0**	0.0	0
August	12.4	103	99	91	9	21,987	99	5	66	**22,053**	8.2	494	**22,053**	8.2	494	**0**	0.0	0
September	7.1	94	54	53	29	71,439	54	40	544	**71,983**	27.8	1,666	**71,983**	27.8	1,666	**0**	0.0	0
October	0.1	79	14	14	47	117,746	14	65	881	**118,627**	44.3	2,657	**118,627**	44.3	2,657	**0**	0.0	0
November	-7.8	75	1	1	27	66,479	1	73	999	**67,478**	26.0	1,562	**67,478**	26.0	1,562	**0**	0.0	0
December	-17.7	64	0	0	2	5,558	0	64	866	**6,424**	2.4	144	**6,424**	2.4	144	**0**	0.0	0
Total	***-3.3 (Avg)***	**877**	**429**	**411**	**465**	**1,155,678**	**429**	**449**	**6,100**	**1,161,778**	**36.6**	**2,195**	**1,161,778**	**36.6**	**2,195**	**0**	**0.0**	**0**

Post-Closure

				(40 mm Water Holding Capacity) Pits and Roads (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-22.0	56	0	0	1	0	0	56	140,340	**140,340**	52.4	3,144	**140,340**	52.4	3,144	**0**	0.0	0
February	-20.4	43	0	0	2	0	0	43	106,633	**106,633**	44.1	2,645	**106,633**	44.1	2,645	**0**	0.0	0
March	-13.5	56	1	1	10	0	1	55	137,495	**137,495**	51.3	3,080	**137,495**	51.3	3,080	**0**	0.0	0
April	-4.6	53	6	6	76	0	6	47	116,334	**116,334**	44.9	2,693	**116,334**	44.9	2,693	**0**	0.0	0
May	3.5	57	42	42	225	0	42	15	36,249	**36,249**	13.5	812	**36,249**	13.5	812	**0**	0.0	0
June	10.3	86	93	91	29	0	93	-7	-18,158	**-18,158**	-7.0	-420	**-18,158**	-7.0	-420	**0**	0.0	0
July	13.7	112	118	112	9	0	118	-6	-14,703	**-14,703**	-5.5	-329	**-14,703**	-5.5	-329	**0**	0.0	0
August	12.4	103	99	91	9	0	99	5	12,118	**12,118**	4.5	271	**12,118**	4.5	271	**0**	0.0	0
September	7.1	94	54	53	29	0	54	40	99,872	**99,872**	38.5	2,312	**99,872**	38.5	2,312	**0**	0.0	0
October	0.1	79	14	14	47	0	14	65	161,832	**161,832**	60.4	3,625	**161,832**	60.4	3,625	**0**	0.0	0
November	-7.8	75	1	1	27	0	1	73	183,570	**183,570**	70.8	4,249	**183,570**	70.8	4,249	**0**	0.0	0
December	-17.7	64	0	0	2	0	0	64	159,094	**159,094**	59.4	3,564	**159,094**	59.4	3,564	**0**	0.0	0
Total	***-3.3 (Avg)***	**877**	**429**	**411**	**465**	**0**	**429**	**449**	**1,120,675**	**1,120,675**	**35.6**	**2,137**	**1,120,675**	**35.6**	**2,137**	**0**	**0.0**	**0**

Table A.14:
Water Balance for Wabush 3 Pit (Wet Year)

Phase 1 Mine Development

			(40 mm Water Holding Capacity) Pits and Roads (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-21.6	91	0	0	0	0	0	91	1,243	**1,243**	0.5	#REF!	**1,243**	0.5	28	**0**	0.0	0
February	-21.1	60	0	0	0	0	0	60	815	**815**	0.3	20	**815**	0.3	20	**0**	0.0	0
March	-12.9	116	0	0	0	316	0	116	1,571	**1,887**	0.7	42	**1,887**	0.7	42	**0**	0.0	0
April	-1.4	102	20	20	285	450,854	20	82	1,108	**451,963**	174.4	10,462	**451,963**	174.4	10,462	**0**	0.0	0
May	3.1	42	41	41	176	278,264	41	1	15	**278,279**	103.9	6,234	**278,279**	103.9	6,234	**0**	0.0	0
June	12.1	96	105	104	0	0	105	-9	-122	**-122**	0.0	-3	**-122**	0.0	-3	**0**	0.0	0
July	12.8	156	112	112	36	56,159	112	44	592	**56,751**	21.2	1,271	**56,751**	21.2	1,271	**0**	0.0	0
August	11.8	93	95	95	0	0	95	-3	-37	**-37**	0.0	-1	**-37**	0.0	-1	**0**	0.0	0
September	8.0	124	60	59	63	99,030	60	64	876	**99,906**	38.5	2,313	**99,906**	38.5	2,313	**0**	0.0	0
October	0.2	85	12	12	67	106,623	12	73	994	**107,617**	40.2	2,411	**107,617**	40.2	2,411	**0**	0.0	0
November	-8.7	125	0	0	6	8,859	0	125	1,697	**10,556**	4.1	244	**10,556**	4.1	244	**0**	0.0	0
December	-20.6	97	0	0	0	0	0	97	1,316	**1,316**	0.5	29	**1,316**	0.5	29	**0**	0.0	0
Total	***-3.5 (Avg)***	**1185**	**445**	**442**	**632**	**1,000,106**	**445**	**740**	**10,068**	**1,010,174**	**32.0**	**1,921**	**1,010,174**	**32.0**	**1,921**	**0**	**0.0**	**0**

Phase 3 Mine Development

			(40 mm Water Holding Capacity) Pits and Roads (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-21.6	91	0	0	0	0	0	91	1,243	**1,243**	0.5	28	**1,243**	0.5	28	**0**	0.0	0
February	-21.1	60	0	0	0	0	0	60	815	**815**	0.3	20	**815**	0.3	20	**0**	0.0	0
March	-12.9	116	0	0	0	497	0	116	1,571	**2,068**	0.8	46	**2,068**	0.8	46	**0**	0.0	0
April	-1.4	102	20	20	285	708,225	20	82	1,108	**709,333**	273.7	16,420	**709,333**	273.7	16,420	**0**	0.0	0
May	3.1	42	41	41	176	437,112	41	1	15	**437,126**	163.2	9,792	**437,126**	163.2	9,792	**0**	0.0	0
June	12.1	96	105	104	0	0	105	-9	-122	**-122**	0.0	-3	**-122**	0.0	-3	**0**	0.0	0
July	12.8	156	112	112	36	88,218	112	44	592	**88,809**	33.2	1,989	**88,809**	33.2	1,989	**0**	0.0	0
August	11.8	93	95	95	0	0	95	-3	-37	**-37**	0.0	-1	**-37**	0.0	-1	**0**	0.0	0
September	8.0	124	60	59	63	155,561	60	64	876	**156,437**	60.4	3,621	**156,437**	60.4	3,621	**0**	0.0	0
October	0.2	85	12	12	67	167,489	12	73	994	**168,483**	62.9	3,774	**168,483**	62.9	3,774	**0**	0.0	0
November	-8.7	125	0	0	6	13,916	0	125	1,697	**15,613**	6.0	361	**15,613**	6.0	361	**0**	0.0	0
December	-20.6	97	0	0	0	0	0	97	1,316	**1,316**	0.5	29	**1,316**	0.5	29	**0**	0.0	0
Total	***-3.5 (Avg)***	**1185**	**445**	**442**	**632**	**1,571,017**	**445**	**740**	**10,068**	**1,581,085**	**50.1**	**3,007**	**1,581,085**	**50.1**	**3,007**	**0**	**0.0**	**0**

Post-Closure

			(40 mm Water Holding Capacity) Pits and Roads (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-21.6	91	0	0	0	0	0	91	228,372	**228,372**	85.3	5,116	**228,372**	85.3	5,116	**0**	0.0	0
February	-21.1	60	0	0	0	0	0	60	149,666	**149,666**	61.9	3,712	**149,666**	61.9	3,712	**0**	0.0	0
March	-12.9	116	0	0	0	0	0	116	288,588	**288,588**	107.7	6,465	**288,588**	107.7	6,465	**0**	0.0	0
April	-1.4	102	20	20	285	0	20	82	203,636	**203,636**	78.6	4,714	**203,636**	78.6	4,714	**0**	0.0	0
May	3.1	42	41	41	176	0	41	1	2,748	**2,748**	1.0	62	**2,748**	1.0	62	**0**	0.0	0
June	12.1	96	105	104	0	0	105	-9	-22,487	**-22,487**	-8.7	-521	**-22,487**	-8.7	-521	**0**	0.0	0
July	12.8	156	112	112	36	0	112	44	108,689	**108,689**	40.6	2,435	**108,689**	40.6	2,435	**0**	0.0	0
August	11.8	93	95	95	0	0	95	-3	-6,746	**-6,746**	-2.5	-151	**-6,746**	-2.5	-151	**0**	0.0	0
September	8.0	124	60	59	63	0	60	64	160,910	**160,910**	62.1	3,725	**160,910**	62.1	3,725	**0**	0.0	0
October	0.2	85	12	12	67	0	12	73	182,648	**182,648**	68.2	4,092	**182,648**	68.2	4,092	**0**	0.0	0
November	-8.7	125	0	0	6	0	0	125	311,825	**311,825**	120.3	7,218	**311,825**	120.3	7,218	**0**	0.0	0
December	-20.6	97	0	0	0	0	0	97	241,864	**241,864**	90.3	5,418	**241,864**	90.3	5,418	**0**	0.0	0
Total	***-3.5 (Avg)***	**1185**	**445**	**442**	**632**	**0**	**445**	**740**	**1,849,714**	**1,849,714**	**58.7**	**3,524**	**1,849,714**	**58.7**	**3,524**	**0**	**0.0**	**0**

Table A.15:
Water Balance for Wabush 3 Pit (Dry Year)

Phase 1 Mine Development

				(40 mm Water Holding Capacity) Pits and Roads (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-28.4	19	0	0	0	0	0	19	262	**262**	0.1	#REF!	**262**	0.1	6	**0**	0.0	0
February	-21.0	35	0	0	0	0	0	35	477	**477**	0.2	12	**477**	0.2	12	**0**	0.0	0
March	-10.7	42	0	0	8	12,972	0	42	564	**13,536**	5.1	303	**13,536**	5.1	303	**0**	0.0	0
April	-5.8	31	2	2	24	37,492	2	29	388	**37,880**	14.6	877	**37,880**	14.6	877	**0**	0.0	0
May	2.9	30	38	37	220	347,395	38	-8	-110	**347,285**	129.7	7,780	**347,285**	129.7	7,780	**0**	0.0	0
June	9.5	58	89	89	0	0	89	-32	-428	**-428**	-0.2	-10	**-428**	-0.2	-10	**0**	0.0	0
July	13.7	76	117	85	0	0	117	-41	-559	**-559**	-0.2	-13	**-559**	-0.2	-13	**0**	0.0	0
August	13.3	93	104	93	0	0	104	-11	-147	**-147**	-0.1	-3	**-147**	-0.1	-3	**0**	0.0	0
September	6.5	62	51	51	0	0	51	11	150	**150**	0.1	3	**150**	0.1	3	**0**	0.0	0
October	0.6	128	16	15	84	132,725	16	112	1,527	**134,252**	50.1	3,007	**134,252**	50.1	3,007	**0**	0.0	0
November	-6.9	67	2	2	12	18,667	2	65	888	**19,555**	7.5	453	**19,555**	7.5	453	**0**	0.0	0
December	-21.2	35	0	0	0	0	0	35	472	**472**	0.2	11	**472**	0.2	11	**0**	0.0	0
Total	***-3.5 (Avg)***	**675**	**419**	**374**	**347**	**549,251**	**419**	**256**	**3,484**	**552,736**	**17.3**	**1,035**	**552,736**	**17.3**	**1,035**	**0**	**0.0**	**0**

Phase 3 Mine Development

				(40 mm Water Holding Capacity) Pits and Roads (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-28.4	19	0	0	0	0	0	19	262	**262**	0.1	6	**262**	0.1	6	**0**	0.0	0
February	-21.0	35	0	0	0	0	0	35	477	**477**	0.2	12	**477**	0.2	12	**0**	0.0	0
March	-10.7	42	0	0	8	20,377	0	42	564	**20,941**	7.8	469	**20,941**	7.8	469	**0**	0.0	0
April	-5.8	31	2	2	24	58,895	2	29	388	**59,282**	22.9	1,372	**59,282**	22.9	1,372	**0**	0.0	0
May	2.9	30	38	37	220	545,706	38	-8	-110	**545,596**	203.7	12,222	**545,596**	203.7	12,222	**0**	0.0	0
June	9.5	58	89	89	0	0	89	-32	-428	**-428**	-0.2	-10	**-428**	-0.2	-10	**0**	0.0	0
July	13.7	76	117	85	0	0	117	-41	-559	**-559**	-0.2	-13	**-559**	-0.2	-13	**0**	0.0	0
August	13.3	93	104	93	0	0	104	-11	-147	**-147**	-0.1	-3	**-147**	-0.1	-3	**0**	0.0	0
September	6.5	62	51	51	0	0	51	11	150	**150**	0.1	3	**150**	0.1	3	**0**	0.0	0
October	0.6	128	16	15	84	208,492	16	112	1,527	**210,019**	78.4	4,705	**210,019**	78.4	4,705	**0**	0.0	0
November	-6.9	67	2	2	12	29,323	2	65	888	**30,211**	11.7	699	**30,211**	11.7	699	**0**	0.0	0
December	-21.2	35	0	0	0	0	0	35	472	**472**	0.2	11	**472**	0.2	11	**0**	0.0	0
Total	***-3.5 (Avg)***	**675**	**419**	**374**	**347**	**862,792**	**419**	**256**	**3,484**	**866,276**	**27.0**	**1,623**	**866,276**	**27.0**	**1,623**	**0**	**0.0**	**0**

Post-Closure

				(40 mm Water Holding Capacity) Pits and Roads (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-28.4	19	0	0	0	0	0	19	48,223	**48,223**	18.0	1,080	**48,223**	18.0	1,080	**0**	0.0	0
February	-21.0	35	0	0	0	0	0	35	87,701	**87,701**	36.3	2,175	**87,701**	36.3	2,175	**0**	0.0	0
March	-10.7	42	0	0	8	0	0	42	103,692	**103,692**	38.7	2,323	**103,692**	38.7	2,323	**0**	0.0	0
April	-5.8	31	2	2	24	0	2	29	71,210	**71,210**	27.5	1,648	**71,210**	27.5	1,648	**0**	0.0	0
May	2.9	30	38	37	220	0	38	-8	-20,239	**-20,239**	-7.6	-453	**-20,239**	-7.6	-453	**0**	0.0	0
June	9.5	58	89	89	0	0	89	-32	-78,706	**-78,706**	-30.4	-1,822	**-78,706**	-30.4	-1,822	**0**	0.0	0
July	13.7	76	117	85	0	0	117	-41	-102,692	**-102,692**	-38.3	-2,300	**-102,692**	-38.3	-2,300	**0**	0.0	0
August	13.3	93	104	93	0	0	104	-11	-26,985	**-26,985**	-10.1	-605	**-26,985**	-10.1	-605	**0**	0.0	0
September	6.5	62	51	51	0	0	51	11	27,485	**27,485**	10.6	636	**27,485**	10.6	636	**0**	0.0	0
October	0.6	128	16	15	84	0	16	112	280,593	**280,593**	104.8	6,286	**280,593**	104.8	6,286	**0**	0.0	0
November	-6.9	67	2	2	12	0	2	65	163,159	**163,159**	62.9	3,777	**163,159**	62.9	3,777	**0**	0.0	0
December	-21.2	35	0	0	0	0	0	35	86,701	**86,701**	32.4	1,942	**86,701**	32.4	1,942	**0**	0.0	0
Total	***-3.5 (Avg)***	**675**	**419**	**374**	**347**	**0**	**419**	**256**	**640,141**	**640,141**	**20.4**	**1,224**	**640,141**	**20.4**	**1,224**	**0**	**0.0**	**0**

Table A.16:
Water Balance for Luce Pit (Average Year)

Existing Conditions

				(40 mm Water Holding Capacity) Pits and Roads (Soil Group B)			(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	**Temperature (°C)**	**Precipitation (mm)**	**Potential Evapotranspiration (mm)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Potential Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Total Surplus (m^3)**	**Average Surplus (Runoff and Infiltration) (L/s)**	**Average Surplus (Runoff and Infiltration) (L/min)**	**Total Runoff (m^3)**	**Average Runoff (L/s)**	**Average Runoff (L/min)**	**Total Infiltration (m^3)**	**Average Infiltration (L/s)**	**Average Infiltration (L/min)**
January	-22.0	56	0	0	1	2,177	0	1	0	0	56	9,099	**11,276**	4.2	253	**11,276**	4.2	253	**0**	0.0	0
February	-20.4	43	0	0	2	5,214	0	2	0	0	43	6,914	**12,128**	5.0	301	**12,128**	5.0	301	**0**	0.0	0
March	-13.5	56	1	1	10	24,677	1	10	0	1	55	8,915	**33,591**	12.5	752	**33,591**	12.5	752	**0**	0.0	0
April	-4.6	53	6	6	76	180,992	6	76	0	6	47	7,543	**188,535**	72.7	4,364	**188,535**	72.7	4,364	**0**	0.0	0
May	3.5	57	42	42	225	537,348	42	224	0	42	15	2,350	**539,698**	201.5	12,090	**539,698**	201.5	12,090	**0**	0.0	0
June	10.3	86	93	91	29	69,147	93	29	0	93	-7	-1,177	**67,969**	26.2	1,573	**67,969**	26.2	1,573	**0**	0.0	0
July	13.7	112	118	112	9	20,650	113	9	0	118	-6	-953	**19,696**	7.4	441	**19,696**	7.4	441	**0**	0.0	0
August	12.4	103	99	91	9	21,174	92	8	0	99	5	786	**21,960**	8.2	492	**21,960**	8.2	492	**0**	0.0	0
September	7.1	94	54	53	29	68,797	53	27	0	54	40	6,475	**75,272**	29.0	1,742	**75,272**	29.0	1,742	**0**	0.0	0
October	0.1	79	14	14	47	113,392	14	46	0	14	65	10,493	**123,884**	46.3	2,775	**123,884**	46.3	2,775	**0**	0.0	0
November	-7.8	75	1	1	27	64,020	1	26	0	1	73	11,902	**75,922**	29.3	1,757	**75,922**	29.3	1,757	**0**	0.0	0
December	-17.7	64	0	0	2	5,352	0	2	0	0	64	10,315	**15,667**	5.8	351	**15,667**	5.8	351	**0**	0.0	0
Total	***-3.3 (Avg)***	**877**	**429**	**411**	**465**	**1,112,939**	**416**	**460**	**0**	**429**	**449**	**72,660**	**1,185,599**	**37.4**	**2,241**	**1,185,599**	**37.4**	**2,241**	**0**	**0.0**	**0**

Phase 1 / Phase 3 Mine Development

				(40 mm Water Holding Capacity) Pits and Roads (Soil Group B)			(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	**Temperature (°C)**	**Precipitation (mm)**	**Potential Evapotranspiration (mm)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Potential Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Total Surplus (m^3)**	**Average Surplus (Runoff and Infiltration) (L/s)**	**Average Surplus (Runoff and Infiltration) (L/min)**	**Total Runoff (m^3)**	**Average Runoff (L/s)**	**Average Runoff (L/min)**	**Total Infiltration (m^3)**	**Average Infiltration (L/s)**	**Average Infiltration (L/min)**
January	-22.0	56	0	0	1	1,841	0	1	335	0	56	9,099	**11,276**	4.2	253	**11,075**	4.1	248	**201**	0.1	5
February	-20.4	43	0	0	2	4,411	0	2	803	0	43	6,914	**12,128**	5.0	301	**11,646**	4.8	289	**482**	0.2	12
March	-13.5	56	1	1	10	20,875	1	10	3,802	1	55	8,915	**33,591**	12.5	752	**31,310**	11.7	701	**2,281**	0.9	51
April	-4.6	53	6	6	76	153,107	6	76	27,857	6	47	7,543	**188,506**	72.7	4,364	**171,792**	66.3	3,977	**16,714**	6.4	387
May	3.5	57	42	42	225	454,560	42	224	82,733	42	15	2,350	**539,643**	201.5	12,089	**490,003**	182.9	10,977	**49,640**	18.5	1,112
June	10.3	86	93	91	29	58,493	93	29	10,653	93	-7	-1,177	**67,969**	26.2	1,573	**61,577**	23.8	1,425	**6,392**	2.5	148
July	13.7	112	118	112	9	17,468	113	9	3,181	118	-6	-953	**19,696**	7.4	441	**17,788**	6.6	398	**1,909**	0.7	43
August	12.4	103	99	91	9	17,912	92	8	2,962	99	5	786	**21,660**	8.1	485	**19,883**	7.4	445	**1,777**	0.7	40
September	7.1	94	54	53	29	58,198	53	27	9,873	54	40	6,475	**74,546**	28.8	1,726	**68,622**	26.5	1,588	**5,924**	2.3	137
October	0.1	79	14	14	47	95,922	14	46	16,998	14	65	10,493	**123,413**	46.1	2,765	**113,214**	42.3	2,536	**10,199**	3.8	228
November	-7.8	75	1	1	27	54,157	1	26	9,744	1	73	11,902	**75,802**	29.2	1,755	**69,956**	27.0	1,619	**5,846**	2.3	135
December	-17.7	64	0	0	2	4,528	0	2	781	0	64	10,315	**15,623**	5.8	350	**15,155**	5.7	339	**468**	0.2	10
Total	***-3.3 (Avg)***	**877**	**429**	**411**	**465**	**941,471**	**416**	**460**	**169,723**	**429**	**449**	**72,660**	**1,183,854**	**37.3**	**2,238**	**1,082,020**	**34.1**	**2,045**	**101,834**	**3.2**	**192**

Post-Closure

				(40 mm Water Holding Capacity) Pits and Roads (Soil Group B)			(100 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	**Temperature (°C)**	**Precipitation (mm)**	**Potential Evapotranspiration (mm)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Actual Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Potential Evapotranspiration (mm)**	**Surplus (mm)**	**Surplus (m^3)**	**Total Surplus (m^3)**	**Average Surplus (Runoff and Infiltration) (L/s)**	**Average Surplus (Runoff and Infiltration) (L/min)**	**Total Runoff (m^3)**	**Average Runoff (L/s)**	**Average Runoff (L/min)**	**Total Infiltration (m^3)**	**Average Infiltration (L/s)**	**Average Infiltration (L/min)**
January	-22.0	56	0	0	1	1,841	0	1	311	0	56	9,099	**11,252**	4.2	252	**11,065**	4.1	248	**187**	0.1	4
February	-20.4	43	0	0	2	4,411	0	2	678	0	43	6,914	**12,002**	5.0	298	**11,596**	4.8	288	**407**	0.2	10
March	-13.5	56	1	1	10	20,875	1	10	3,862	1	55	8,915	**33,651**	12.6	754	**31,334**	11.7	702	**2,317**	0.9	52
April	-4.6	53	6	6	76	153,107	6	71	26,163	6	47	7,543	**186,812**	72.1	4,324	**171,115**	66.0	3,961	**15,698**	6.1	363
May	3.5	57	42	42	225	454,560	42	225	83,038	42	15	2,350	**539,948**	201.6	12,096	**490,125**	183.0	10,980	**49,823**	18.6	1,116
June	10.3	86	93	91	29	58,493	92	33	12,258	93	-7	-1,177	**69,574**	26.8	1,611	**62,219**	24.0	1,440	**7,355**	2.8	170
July	13.7	112	118	112	9	17,468	117	9	3,183	118	-6	-953	**19,698**	7.4	441	**17,788**	6.6	398	**1,910**	0.7	43
August	12.4	103	99	91	9	17,912	96	6	2,183	99	5	786	**20,881**	7.8	468	**19,571**	7.3	438	**1,310**	0.5	29
September	7.1	94	54	53	29	58,198	53	23	8,610	54	40	6,475	**73,282**	28.3	1,696	**68,117**	26.3	1,577	**5,166**	2.0	120
October	0.1	79	14	14	47	95,922	13	39	14,445	14	65	10,493	**120,859**	45.1	2,707	**112,192**	41.9	2,513	**8,667**	3.2	194
November	-7.8	75	1	1	27	54,157	1	22	8,014	1	73	11,902	**74,073**	28.6	1,715	**69,264**	26.7	1,603	**4,808**	1.9	111
December	-17.7	64	0	0	2	4,528	0	0	166	0	64	10,315	**15,009**	5.6	336	**14,909**	5.6	334	**100**	0.0	2
Total	***-3.3 (Avg)***	**877**	**429**	**411**	**465**	**941,471**	**422**	**442**	**162,911**	**429**	**449**	**72,660**	**1,177,042**	**37.1**	**2,225**	**1,079,296**	**34.0**	**2,040**	**97,747**	**3.1**	**185**

Table A.17:
Water Balance for Luce Pit (Average Year)

Existing Conditions

				(40 mm Water Holding Capacity) Pits and Roads (Soil Group B)			(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-21.6	91	0	0	0	0	0	0	0	0	91	14,807	**14,807**	5.5	332	**14,807**	5.5	332	**0**	0.0	0
February	-21.1	60	0	0	0	0	0	0	0	0	60	9,704	**9,704**	4.0	241	**9,704**	4.0	241	**0**	0.0	0
March	-12.9	116	0	0	0	479	0	0	0	0	116	18,711	**19,190**	7.2	430	**19,190**	7.2	430	**0**	0.0	0
April	-1.4	102	20	20	285	682,034	20	285	0	20	82	13,203	**695,237**	268.2	16,093	**695,237**	268.2	16,093	**0**	0.0	0
May	3.1	42	41	41	176	420,946	41	176	0	41	1	178	**421,124**	157.2	9,434	**421,124**	157.2	9,434	**0**	0.0	0
June	12.1	96	105	104	0	0	104	0	0	105	-9	-1,458	**-1,458**	-0.6	-34	**-1,458**	-0.6	-34	**0**	0.0	0
July	12.8	156	112	112	36	84,955	112	36	0	112	44	7,047	**92,002**	34.3	2,061	**92,002**	34.3	2,061	**0**	0.0	0
August	11.8	93	95	95	0	0	95	0	0	95	-3	-437	**-437**	-0.2	-10	**-437**	-0.2	-10	**0**	0.0	0
September	8.0	124	60	59	63	149,808	59	63	0	60	64	10,433	**160,241**	61.8	3,709	**160,241**	61.8	3,709	**0**	0.0	0
October	0.2	85	12	12	67	161,295	12	67	0	12	73	11,842	**173,137**	64.6	3,879	**173,137**	64.6	3,879	**0**	0.0	0
November	-8.7	125	0	0	6	13,401	0	6	0	0	125	20,218	**33,619**	13.0	778	**33,619**	13.0	778	**0**	0.0	0
December	-20.6	97	0	0	0	0	0	0	0	0	97	15,682	**15,682**	5.9	351	**15,682**	5.9	351	**0**	0.0	0
Total	***=3.2 (Avg)***	**877**	**429**	**442**	**632**	**1,512,918**	**442**	**632**	**0**	**445**	**740**	**119,929**	**1,632,846**	**51.8**	**3,105**	**1,632,846**	**51.8**	**3,105**	**0**	**0.0**	**0**

Phase 1 / Phase 3 Mine Development

				(40 mm Water Holding Capacity) Pits and Roads (Soil Group B)			(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-21.6	91	0	0	0	0	0	0	0	0	91	14,807	**14,807**	5.5	332	**14,807**	5.5	332	**0**	0.0	0
February	-21.1	60	0	0	0	0	0	0	0	0	60	9,704	**9,704**	4.0	241	**9,704**	4.0	241	**0**	0.0	0
March	-12.9	116	0	0	0	405	0	0	74	0	116	18,711	**19,190**	7.2	430	**19,145**	7.1	429	**44**	0.0	1
April	-1.4	102	20	20	285	576,954	20	285	105,080	20	82	13,203	**695,237**	268.2	16,093	**632,189**	243.9	14,634	**63,048**	24.3	1,459
May	3.1	42	41	41	176	356,092	41	176	64,854	41	1	178	**421,124**	157.2	9,434	**382,212**	142.7	8,562	**38,913**	14.5	872
June	12.1	96	105	104	0	0	104	0	0	105	-9	-1,458	**-1,458**	-0.6	-34	**-1,458**	-0.6	-34	**0**	0.0	0
July	12.8	156	112	112	36	71,866	112	36	13,089	112	44	7,047	**92,002**	34.3	2,061	**84,149**	31.4	1,885	**7,853**	2.9	176
August	11.8	93	95	95	0	0	95	0	0	95	-3	-437	**-437**	-0.2	-10	**-437**	-0.2	-10	**0**	0.0	0
September	8.0	124	60	59	63	126,727	59	63	23,081	60	64	10,433	**160,241**	61.8	3,709	**146,392**	56.5	3,389	**13,848**	5.3	321
October	0.2	85	12	12	67	136,445	12	67	24,850	12	73	11,842	**173,137**	64.6	3,879	**158,227**	59.1	3,545	**14,910**	5.6	334
November	-8.7	125	0	0	6	11,337	0	6	2,065	0	125	20,218	**33,619**	13.0	778	**32,380**	12.5	750	**1,239**	0.5	29
December	-20.6	97	0	0	0	0	0	0	0	0	97	15,682	**15,682**	5.9	351	**15,682**	5.9	351	**0**	0.0	0
Total	***=3.2 (Avg)***	**877**	**429**	**442**	**632**	**1,279,826**	**442**	**632**	**233,092**	**445**	**740**	**119,929**	**1,632,846**	**51.8**	**3,105**	**1,492,991**	**47.3**	**2,839**	**139,855**	**4.4**	**266**

Post-Closure

				(40 mm Water Holding Capacity) Pits and Roads (Soil Group B)			(100 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-21.6	91	0	0	0	0	0	0	0	0	91	14,807	**14,807**	5.5	332	**14,807**	5.5	332	**0**	0.0	0
February	-21.1	60	0	0	0	0	0	0	0	0	60	9,704	**9,704**	4.0	241	**9,704**	4.0	241	**0**	0.0	0
March	-12.9	116	0	0	0	405	0	0	74	0	116	18,711	**19,190**	7.2	430	**19,145**	7.1	429	**44**	0.0	1
April	-1.4	102	20	20	285	576,954	20	285	105,006	20	82	13,203	**695,163**	268.2	16,092	**632,159**	243.9	14,633	**63,003**	24.3	1,458
May	3.1	42	41	41	176	356,092	41	176	64,744	41	1	178	**421,014**	157.2	9,431	**382,168**	142.7	8,561	**38,846**	14.5	870
June	12.1	96	105	104	0	0	105	0	0	105	-9	-1,458	**-1,458**	-0.6	-34	**-1,458**	-0.6	-34	**0**	0.0	0
July	12.8	156	112	112	36	71,866	112	35	12,720	112	44	7,047	**91,633**	34.2	2,053	**84,001**	31.4	1,882	**7,632**	2.8	171
August	11.8	93	95	95	0	0	95	0	0	95	-3	-437	**-437**	-0.2	-10	**-437**	-0.2	-10	**0**	0.0	0
September	8.0	124	60	59	63	126,727	60	62	22,749	60	64	10,433	**159,909**	61.7	3,702	**146,260**	56.4	3,386	**13,649**	5.3	316
October	0.2	85	12	12	67	136,445	12	67	24,814	12	73	11,842	**173,100**	64.6	3,878	**158,212**	59.1	3,544	**14,888**	5.6	334
November	-8.7	125	0	0	6	11,337	0	6	2,065	0	125	20,218	**33,619**	13.0	778	**32,380**	12.5	750	**1,239**	0.5	29
December	-20.6	97	0	0	0	0	0	0	0	0	97	15,682	**15,682**	5.9	351	**15,682**	5.9	351	**0**	0.0	0
Total	***=3.2 (Avg)***	**877**	**429**	**442**	**632**	**1,279,826**	**445**	**630**	**232,170**	**445**	**740**	**119,929**	**1,631,925**	**51.7**	**3,104**	**1,492,622**	**47.3**	**2,839**	**139,302**	**4.4**	**265**

Table A.18:
Water Balance for Luce Pit Watershed (Average Year)

Existing Conditions

				(40 mm Water Holding Capacity) Pits and Roads (Soil Group B)			(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-28.4	19	0	0	0	0	0	0	0	0	19	3,127	**3,127**	1.2	70	**3,127**	1.2	70	**0**	0.0	0
February	-21.0	35	0	0	0	0	0	0	0	0	35	5,686	**5,686**	2.4	141	**5,686**	2.4	141	**0**	0.0	0
March	-10.7	42	0	0	8	19,623	0	8	0	0	42	6,723	**26,346**	9.8	590	**26,346**	9.8	590	**0**	0.0	0
April	-5.8	31	2	2	24	56,716	2	24	0	2	29	4,617	**61,333**	23.7	1,420	**61,333**	23.7	1,420	**0**	0.0	0
May	2.9	30	38	37	220	525,525	37	220	0	38	-8	-1,312	**524,213**	195.7	11,743	**524,213**	195.7	11,743	**0**	0.0	0
June	9.5	58	89	89	0	0	89	0	0	89	-32	-5,103	**-5,103**	-2.0	-118	**-5,103**	-2.0	-118	**0**	0.0	0
July	13.7	76	117	85	0	0	95	0	0	117	-41	-6,658	**-6,658**	-2.5	-149	**-6,658**	-2.5	-149	**0**	0.0	0
August	13.3	93	104	93	0	0	93	0	0	104	-11	-1,750	**-1,750**	-0.7	-39	**-1,750**	-0.7	-39	**0**	0.0	0
September	6.5	62	51	51	0	0	51	0	0	51	11	1,782	**1,782**	0.7	41	**1,782**	0.7	41	**0**	0.0	0
October	0.6	128	16	15	84	200,781	15	74	0	16	112	18,193	**218,974**	81.8	4,905	**218,974**	81.8	4,905	**0**	0.0	0
November	-6.9	67	2	2	12	28,239	2	12	0	2	65	10,579	**38,817**	15.0	899	**38,817**	15.0	899	**0**	0.0	0
December	-21.2	35	0	0	0	0	0	0	0	0	35	5,621	**5,621**	2.1	126	**5,621**	2.1	126	**0**	0.0	0
Total	***4.6 (Avg)***	**877**	**429**	**374**	**347**	**830,884**	**384**	**337**	**0**	**419**	**256**	**41,504**	**872,389**	**27.3**	**1,636**	**872,389**	**27.3**	**1,636**	**0**	**0.0**	**0**

Phase 1 / Phase 3 Conditions

				(40 mm Water Holding Capacity) Pits and Roads (Soil Group B)			(50 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-28.4	19	0	0	0	0	0	0	0	0	19	3,127	**3,127**	1.2	70	**3,127**	1.2	70	**0**	0.0	0
February	-21.0	35	0	0	0	0	0	0	0	0	35	5,686	**5,686**	2.4	141	**5,686**	2.4	141	**0**	0.0	0
March	-10.7	42	0	0	8	16,600	0	8	3,023	0	42	6,723	**26,346**	9.8	590	**24,532**	9.2	550	**1,814**	0.7	41
April	-5.8	31	2	2	24	47,978	2	24	8,738	2	29	4,617	**61,333**	23.7	1,420	**56,091**	21.6	1,298	**5,243**	2.0	121
May	2.9	30	38	37	220	444,558	37	220	80,967	38	-8	-1,312	**524,213**	195.7	11,743	**475,633**	177.6	10,655	**48,580**	18.1	1,088
June	9.5	58	89	89	0	0	89	0	0	89	-32	-5,103	**-5,103**	-2.0	-118	**-5,103**	-2.0	-118	**0**	0.0	0
July	13.7	76	117	85	0	0	95	0	0	117	-41	-6,658	**-6,658**	-2.5	-149	**-6,658**	-2.5	-149	**0**	0.0	0
August	13.3	93	104	93	0	0	93	0	0	104	-11	-1,750	**-1,750**	-0.7	-39	**-1,750**	-0.7	-39	**0**	0.0	0
September	6.5	62	51	51	0	0	51	0	0	51	11	1,782	**1,782**	0.7	41	**1,782**	0.7	41	**0**	0.0	0
October	0.6	128	16	15	84	169,847	15	74	27,247	16	112	18,193	**215,287**	80.4	4,823	**198,939**	74.3	4,457	**16,348**	6.1	366
November	-6.9	67	2	2	12	23,888	2	12	4,351	2	65	10,579	**38,817**	15.0	899	**36,207**	14.0	838	**2,610**	1.0	60
December	-21.2	35	0	0	0	0	0	0	0	0	35	5,621	**5,621**	2.1	126	**5,621**	2.1	126	**0**	0.0	0
Total	***4.6 (Avg)***	**877**	**429**	**374**	**347**	**702,872**	**384**	**337**	**124,326**	**419**	**256**	**41,504**	**868,702**	**27.1**	**1,629**	**794,106**	**24.8**	**1,489**	**74,595**	**2.3**	**140**

Post-Closure

				(40 mm Water Holding Capacity) Pits and Roads (Soil Group B)			(100 mm Water Holding Capacity) Mine & Industrial Waste (Soil Group B)			Lakes and Wetlands (Precip - PE)			Total Surplus			Runoff			Infiltration		
Month	Temperature (°C)	Precipitation (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Actual Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Potential Evapotranspiration (mm)	Surplus (mm)	Surplus (m^3)	Total Surplus (m^3)	Average Surplus (Runoff and Infiltration) (L/s)	Average Surplus (Runoff and Infiltration) (L/min)	Total Runoff (m^3)	Average Runoff (L/s)	Average Runoff (L/min)	Total Infiltration (m^3)	Average Infiltration (L/s)	Average Infiltration (L/min)
January	-28.4	19	0	0	0	0	0	0	0	0	19	3,127	**3,127**	1.2	70	**3,127**	1.2	70	**0**	0.0	0
February	-21.0	35	0	0	0	0	0	0	0	0	35	5,686	**5,686**	2.4	141	**5,686**	2.4	141	**0**	0.0	0
March	-10.7	42	0	0	8	16,600	0	8	3,023	0	42	6,723	**26,346**	9.8	590	**24,532**	9.2	550	**1,814**	0.7	41
April	-5.8	31	2	2	24	47,978	2	24	8,738	2	29	4,617	**61,333**	23.7	1,420	**56,091**	21.6	1,298	**5,243**	2.0	121
May	2.9	30	38	37	220	444,558	38	219	80,856	38	-8	-1,312	**524,102**	195.7	11,741	**475,588**	177.6	10,654	**48,514**	18.1	1,087
June	9.5	58	89	89	0	0	89	0	0	89	-32	-5,103	**-5,103**	-2.0	-118	**-5,103**	-2.0	-118	**0**	0.0	0
July	13.7	76	117	85	0	0	117	0	0	117	-41	-6,658	**-6,658**	-2.5	-149	**-6,658**	-2.5	-149	**0**	0.0	0
August	13.3	93	104	93	0	0	98	0	0	104	-11	-1,750	**-1,750**	-0.7	-39	**-1,750**	-0.7	-39	**0**	0.0	0
September	6.5	62	51	51	0	0	51	0	0	51	11	1,782	**1,782**	0.7	41	**1,782**	0.7	41	**0**	0.0	0
October	0.6	128	16	15	84	169,847	16	46	16,886	16	112	18,193	**204,926**	76.5	4,591	**194,794**	72.7	4,364	**10,132**	3.8	227
November	-6.9	67	2	2	12	23,888	2	12	4,351	2	65	10,579	**38,817**	15.0	899	**36,207**	14.0	838	**2,610**	1.0	60
December	-21.2	35	0	0	0	0	0	0	0	0	35	5,621	**5,621**	2.1	126	**5,621**	2.1	126	**0**	0.0	0
Total	***4.6 (Avg)***	**877**	**429**	**374**	**347**	**702,872**	**413**	**309**	**113,855**	**419**	**256**	**41,504**	**858,231**	**26.8**	**1,609**	**789,918**	**24.7**	**1,481**	**68,313**	**2.1**	**128**

APPENDIX B

Hydrological Model Details

Table B.1
Summary of Hydrologic Modelling Results

Existing Conditions		2-year			5-year			10-year			25-year			50-year			100-year		
	Area (ha)	Total Runoff (mm)	Peak Runoff (m^3/s)	Runoff Volume (m^3)	Total Runoff (mm)	Peak Runoff (m^3/s)	Runoff Volume (m^3)	Total Runoff (mm)	Peak Runoff (m^3/s)	Runoff Volume (m^3)	Total Runoff (mm)	Peak Runoff (m^3/s)	Runoff Volume (m^3)	Total Runoff (mm)	Peak Runoff (m^3/s)	Runoff Volume (m^3)	Total Runoff (mm)	Peak Runoff (m^3/s)	Runoff Volume (m^3)
Dumbell Lake Catchment	828.38	8.42	1.52	69750	12.72	2.9	105370	16.19	4.01	134115	21.2	5.99	175617	23.93	7.02	198232	27.69	9.53	229379
LegLakeUpstream	506.77	8.45	0.94	42822	12.77	1.79	64715	16.21	2.48	82147	21.22	3.7	107537	23.97	4.33	121473	27.72	5.89	140477
HarrieLakeCatchment	947.23	6.94	1.18	65738	10.86	2.2	102869	14.01	3.06	132707	18.69	4.57	177038	21.23	5.37	201097	24.86	7.24	235482
PumphouseLakeCatchment	76.12	9.54	0.28	7262	13.81	0.56	10512	17.26	0.78	13138	22.21	1.16	16906	24.96	1.36	19000	28.53	1.88	21717
DrumLakeCatchment	70.62	7.71	0.11	5445	11.83	0.21	8354	15.14	0.28	10692	19.99	0.43	14117	22.63	0.5	15981	26.34	0.68	18601
Harrie Lake Junction	1600.743	--	1.21	91300	--	2.237	148000	--	3.104	195000	--	4.633	266000	--	5.449	304000	--	7.316	359000

Phase 1		2-year			5-year			10-year			25-year			50-year			100-year		
	Area (ha)	Total Runoff (mm)	Peak Runoff (m^3/s)	Runoff Volume (m^3)	Total Runoff (mm)	Peak Runoff (m^3/s)	Runoff Volume (m^3)	Total Runoff (mm)	Peak Runoff (m^3/s)	Runoff Volume (m^3)	Total Runoff (mm)	Peak Runoff (m^3/s)	Runoff Volume (m^3)	Total Runoff (mm)	Peak Runoff (m^3/s)	Runoff Volume (m^3)	Total Runoff (mm)	Peak Runoff (m^3/s)	Runoff Volume (m^3)
Dumbell Lake Catchment	711.45	9.09	1.53	64671	13.58	2.94	96616	17.16	4.06	122086	22.32	6.05	158797	25.15	7.07	178931	28.97	9.63	206108
LegLakeUpstream	559.62	5.31	0.56	29716	8.32	1.07	46560	10.8	1.51	60439	14.52	2.3	81257	16.59	2.72	92841	19.56	3.73	109462
HarrieLakeCatchment	911.36	7.01	1.17	63886	10.95	2.18	99794	14.1	3.03	128501	18.79	4.53	171244	21.33	5.32	194392	24.97	7.18	227566
PumphouseLakeCatchment	42.27	10.65	0.25	4502	15.2	0.52	6425	18.89	0.71	7985	24.12	1.04	10196	27.03	1.21	11426	30.71	1.68	12981
DrumLakeCatchment	44.86	8.9	0.1	3993	13.26	0.19	5948	16.74	0.26	7510	21.77	0.39	9766	24.54	0.46	11009	28.27	0.63	12682
Wabush3Phase1	229.98	17.6	0.67	40476	24.85	1.14	57150	30.29	1.49	69661	37.72	2.07	86748	41.66	2.35	95810	46.75	3.02	107516
Harrie Lake Junction	1558.107	--	1.177	78600	--	2.194	128000	--	3.046	169000	--	4.553	230000	--	5.353	265000	--	7.211	314000

Phase 3		2-year			5-year			10-year			25-year			50-year			100-year		
	Area (ha)	Total Runoff (mm)	Peak Runoff (m^3/s)	Runoff Volume (m^3)	Total Runoff (mm)	Peak Runoff (m^3/s)	Runoff Volume (m^3)	Total Runoff (mm)	Peak Runoff (m^3/s)	Runoff Volume (m^3)	Total Runoff (mm)	Peak Runoff (m^3/s)	Runoff Volume (m^3)	Total Runoff (mm)	Peak Runoff (m^3/s)	Runoff Volume (m^3)	Total Runoff (mm)	Peak Runoff (m^3/s)	Runoff Volume (m^3)
Dumbell Lake Catchment	703.03	9.11	1.52	64046	13.6	2.93	95612	17.18	4.04	120781	22.34	6.03	157057	25.17	7.05	176953	29	9.6	203879
LegLakeUpstream	532.59	5.18	0.52	27588	8.09	1.00	43087	10.5	4.04	55922	14.13	2.16	75255	16.15	2.56	86013	19.04	3.51	101405
HarrieLakeCatchment	899.81	7.11	1.15	63976	11.06	2.15	99519	14.23	2.99	128042	18.93	4.47	170333	21.49	5.25	193368	25.11	7.09	225941
PumphouseLakeCatchment	14.38	9.17	0.13	1319	13.24	0.27	1904	16.6	0.36	2387	21.38	0.53	3074	24.07	0.62	3461	27.42	0.86	3943
DrumLakeCatchment	29.32	9.1	0.08	2668	13.35	0.16	3914	16.77	0.22	4917	21.7	0.33	6362	24.44	0.39	7166	28.04	0.53	8221
Wabush3Phase1	328.65	16.64	0.75	54687	23.88	1.25	78482	29.28	1.63	96229	36.68	2.25	120549	40.59	2.57	133399	45.67	3.26	150094
Harrie Lake Junction	1476.096	--	1.156	73600	--	2.164	119000	--	3.005	156000	--	4.495	213000	--	5.285	244000	--	7.128	289000

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.001)

NOTE: The summary statistics displayed in this report are based on results found at every computational time step, not just on results from each reporting time step.

****
Analysis Options
****

Flow Units	CMS
Process Models:	
Rainfall/Runoff	YES
Snowmelt	NO
Groundwater	NO
Flow Routing	YES
Ponding Allowed	NO
Water Quality	NO
Infiltration Method	CURVE_NUMBER
Flow Routing Method	DYNWAVE
Starting Date	JAN-01-2014 00:00:00
Ending Date	JAN-04-2014 00:00:00
Antecedent Dry Days	0.0
Report Time Step	00:15:00
Wet Time Step	00:05:00
Dry Time Step	00:05:00
Routing Time Step	30.00 sec
Variable Time Step	YES
Maximum Trials	8
Head Tolerance	0.016404 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	83.020	34.480
Evaporation Loss	0.000	0.000
Infiltration Loss	62.906	26.126
Surface Runoff	18.953	7.872
Final Surface Storage	1.163	0.483
Continuity Error (%)	-0.002	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	18.951	189.508
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.000	0.000
Internal Outflow	8.780	87.805
Evaporation Loss	0.000	0.000
Seepage Loss	0.000	0.000
Initial Stored Volume	1491.048	14910.631
Final Stored Volume	1501.217	15012.323
Continuity Error (%)	0.000	

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
All links are stable.

****
Routing Time Step Summary
****

Minimum Time Step	:	30.00 sec
Average Time Step	:	30.00 sec
Maximum Time Step	:	30.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.00
Percent Not Converging	:	0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
DumbellLakeCatchment	34.48	0.00	0.00	25.62	8.42	69.78	1.52	0.244
LegLakeUpstream	34.48	0.00	0.00	25.60	8.45	42.81	0.94	0.245
HarrieLakeCatchment	34.48	0.00	0.00	26.97	6.94	64.24	1.18	0.201
PumphouseLakeCatchment	34.48	0.00	0.00	24.77	9.54	7.26	0.28	0.277
DrumLakeCatchment	34.48	0.00	0.00	26.27	7.71	5.45	0.11	0.224

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
HarrieLakeInflow	JUNCTION	0.83	1.00	531.00	0 12:59
1	OUTFALL	0.00	0.00	0.00	0 00:00

DOutfall	OUTFALL	0.00	0.00	0.00	0	00:00
LegLake	STORAGE	24.81	24.83	736.08	1	05:50
DumbellLake	STORAGE	31.06	31.08	31.08	3	00:00
PumphouseLake	STORAGE	5.03	5.06	747.03	0	23:49
DrumLake	STORAGE	1.81	1.90	740.13	0	19:14

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
HarrieLakeInflow	JUNCTION	1.180	1.210	0 16:05	64.2	91.3	0.000
1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
DOutfall	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
LegLake	STORAGE	0.937	1.039	0 14:47	42.8	6.94e+003	0.002
DumbellLake	STORAGE	1.519	1.519	0 14:10	69.8	7.9e+003	-0.876
PumphouseLake	STORAGE	0.280	0.280	0 12:40	7.26	202	0.003
DrumLake	STORAGE	0.109	0.150	0 18:10	5.45	12	0.626

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
HarrieLakeInflow	JUNCTION	59.02	0.000	0.000
DumbellLake	STORAGE	72.00	31.079	3.421

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Maximum	Time of Max	Total Flood	Maximum Ponded

Node	Hours Flooded	Rate CMS	Occurrence days hr:min	Volume 10^6 ltr	Depth Meters
HarrieLakeInflow	59.02	1.210	0 16:05	87.806	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Infil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
LegLake	6915.484	91	0	0	6928.913	91	1 05:50	0.177
DumbellLake	7876.781	72	0	0	7897.395	72	3 00:00	0.000
PumphouseLake	196.615	46	0	0	198.857	46	0 23:49	0.064
DrumLake	0.607	4	0	0	0.941	6	0 19:14	0.149

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
1	0.00	0.000	0.000	0.000
DOutfall	0.00	0.000	0.000	0.000
System	0.00	0.000	0.000	0.000

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
1	CONDUIT	0.064	0 23:49	0.40	0.01	0.09
3	CONDUIT	0.149	0 19:14	0.69	0.04	0.11
4	CONDUIT	0.177	1 05:51	0.17	0.02	0.53

****
Flow Classification Summary

****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
1	1.00	0.09	0.01	0.00	0.90	0.00	0.00	0.00	0.90	0.00
3	1.00	0.09	0.00	0.00	0.63	0.00	0.00	0.29	0.56	0.00
4	1.00	0.07	0.04	0.00	0.89	0.00	0.00	0.00	0.89	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Apr 17 14:19:28 2014
Analysis ended on: Thu Apr 17 14:19:28 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.001)

NOTE: The summary statistics displayed in this report are based on results found at every computational time step, not just on results from each reporting time step.

Analysis Options

Flow Units	CMS
Process Models:	
Rainfall/Runoff	YES
Snowmelt	NO
Groundwater	NO
Flow Routing	YES
Ponding Allowed	NO
Water Quality	NO
Infiltration Method	CURVE_NUMBER
Flow Routing Method	DYNWAVE
Starting Date	JAN-01-2014 00:00:00
Ending Date	JAN-04-2014 00:00:00
Antecedent Dry Days	0.0
Report Time Step	00:15:00
Wet Time Step	00:05:00
Dry Time Step	00:05:00
Routing Time Step	30.00 sec
Variable Time Step	YES
Maximum Trials	8
Head Tolerance	0.016404 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	102.708	42.657
Evaporation Loss	0.000	0.000
Infiltration Loss	72.551	30.132
Surface Runoff	28.965	12.030
Final Surface Storage	1.195	0.497
Continuity Error (%)	-0.003	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	28.963	289.630
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.000	0.000
Internal Outflow	14.491	144.911
Evaporation Loss	0.000	0.000
Seepage Loss	0.000	0.000
Initial Stored Volume	1491.048	14910.631
Final Stored Volume	1505.516	15055.318
Continuity Error (%)	0.000	

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
All links are stable.

****
Routing Time Step Summary
****

Minimum Time Step	:	30.00 sec
Average Time Step	:	30.00 sec
Maximum Time Step	:	30.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.00
Percent Not Converging	:	0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
DumbellLakeCatchment	42.66	0.00	0.00	29.48	12.73	105.49	2.90	0.299
LegLakeUpstream	42.66	0.00	0.00	29.44	12.77	64.72	1.79	0.299
HarrieLakeCatchment	42.66	0.00	0.00	31.20	10.86	100.58	2.20	0.255
PumphouseLakeCatchment	42.66	0.00	0.00	28.68	13.81	10.51	0.56	0.324
DrumLakeCatchment	42.66	0.00	0.00	30.32	11.83	8.36	0.21	0.277

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
HarrieLakeInflow	JUNCTION	0.83	1.00	531.00	0 12:30
1	OUTFALL	0.00	0.00	0.00	0 00:00

DOutfall	OUTFALL	0.00	0.00	0.00	0	00:00
LegLake	STORAGE	24.82	24.86	736.11	1	04:34
DumbellLake	STORAGE	31.09	31.12	31.12	3	00:00
PumphouseLake	STORAGE	5.03	5.08	747.05	0	20:09
DrumLake	STORAGE	1.83	1.95	740.19	0	16:53

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
HarrieLakeInflow	JUNCTION	2.203	2.237	0 14:15	101	148	0.000
1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
DOutfall	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
LegLake	STORAGE	1.790	1.948	0 13:40	64.7	6.97e+003	0.003
DumbellLake	STORAGE	2.900	2.900	0 13:20	105	7.93e+003	-1.312
PumphouseLake	STORAGE	0.563	0.563	0 12:30	10.5	205	0.003
DrumLake	STORAGE	0.206	0.267	0 15:45	8.35	18.1	0.546

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
HarrieLakeInflow	JUNCTION	59.51	0.000	0.000
DumbellLake	STORAGE	72.00	31.119	3.381

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Maximum	Time of Max	Total Flood	Maximum Ponded

Node	Hours Flooded	Rate CMS	Occurrence days	hr:min	Volume 10^6 ltr	Depth Meters
HarrieLakeInflow	59.51	2.237	0	14:15	144.913	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Infil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days	hr:min	Maximum Outflow CMS
LegLake	6926.478	91	0	0	6948.316	91	1	04:34	0.337
DumbellLake	7903.805	72	0	0	7933.106	73	3	00:00	0.000
PumphouseLake	197.160	46	0	0	200.506	47	0	20:09	0.109
DrumLake	0.663	4	0	0	1.206	7	0	16:53	0.263

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
1	0.00	0.000	0.000	0.000
DOutfall	0.00	0.000	0.000	0.000
System	0.00	0.000	0.000	0.000

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
1	CONDUIT	0.109	0	20:09	0.47	0.02	0.13
3	CONDUIT	0.263	0	16:53	0.85	0.07	0.15
4	CONDUIT	0.337	1	04:34	0.31	0.03	0.55

****
Flow Classification Summary

****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
1	1.00	0.08	0.01	0.00	0.90	0.00	0.00	0.00	0.90	0.00
3	1.00	0.08	0.00	0.00	0.66	0.00	0.00	0.26	0.60	0.00
4	1.00	0.07	0.04	0.00	0.89	0.00	0.00	0.00	0.89	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Apr 17 14:20:46 2014
Analysis ended on: Thu Apr 17 14:20:46 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.001)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date JAN-01-2014 00:00:00
Ending Date JAN-04-2014 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:15:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Head Tolerance ..... 0.016404 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	117.465	48.786
Evaporation Loss	0.000	0.000
Infiltration Loss	79.280	32.927
Surface Runoff	36.986	15.361
Final Surface Storage	1.205	0.500
Continuity Error (%)	-0.004	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	36.983	369.836
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.000	0.000
Internal Outflow	19.187	191.873
Evaporation Loss	0.000	0.000
Seepage Loss	0.000	0.000
Initial Stored Volume	1491.048	14910.631
Final Stored Volume	1508.842	15088.580
Continuity Error (%)	0.000	

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
All links are stable.

****
Routing Time Step Summary
****

Minimum Time Step	:	30.00 sec
Average Time Step	:	30.00 sec
Maximum Time Step	:	30.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.00
Percent Not Converging	:	0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
DumbellLakeCatchment	48.79	0.00	0.00	32.15	16.19	134.12	4.01	0.332
LegLakeUpstream	48.79	0.00	0.00	32.13	16.21	82.16	2.48	0.332
HarrieLakeCatchment	48.79	0.00	0.00	34.18	14.01	129.74	3.06	0.287
PumphouseLakeCatchment	48.79	0.00	0.00	31.35	17.26	13.14	0.78	0.354
DrumLakeCatchment	48.79	0.00	0.00	33.13	15.14	10.69	0.28	0.310

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
HarrieLakeInflow	JUNCTION	0.84	1.00	531.00	0 12:18
1	OUTFALL	0.00	0.00	0.00	0 00:00

DOutfall	OUTFALL	0.00	0.00	0.00	0	00:00
LegLake	STORAGE	24.84	24.89	736.14	1	03:43
DumbellLake	STORAGE	31.11	31.15	31.15	3	00:00
PumphouseLake	STORAGE	5.04	5.09	747.06	0	19:08
DrumLake	STORAGE	1.83	1.99	740.23	0	16:21

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
HarrieLakeInflow	JUNCTION	3.058	3.104	0 13:55	130	195	0.000
1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
DOutfall	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
LegLake	STORAGE	2.475	2.687	0 13:25	82.2	6.99e+003	0.003
DumbellLake	STORAGE	4.010	4.010	0 13:05	134	7.96e+003	-1.657
PumphouseLake	STORAGE	0.778	0.778	0 12:25	13.1	208	0.004
DrumLake	STORAGE	0.285	0.369	0 15:12	10.7	23	0.504

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
HarrieLakeInflow	JUNCTION	59.70	0.000	0.000
DumbellLake	STORAGE	72.00	31.152	3.348

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Maximum	Time of Max	Total Flood	Maximum Ponded

Node	Hours Flooded	Rate CMS	Occurrence days	Occurrence hr:min	Volume 10^6 ltr	Depth Meters
HarrieLakeInflow	59.70	3.104	0	13:55	191.875	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Infil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days	Time of Max Occurrence hr:min	Maximum Outflow CMS
LegLake	6934.475	91	0	0	6963.414	91	1	03:43	0.485
DumbellLake	7925.511	73	0	0	7961.730	73	3	00:00	0.000
PumphouseLake	197.545	46	0	0	201.803	47	0	19:08	0.149
DrumLake	0.706	4	0	0	1.427	9	0	16:21	0.362

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
1	0.00	0.000	0.000	0.000
DOutfall	0.00	0.000	0.000	0.000
System	0.00	0.000	0.000	0.000

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days	Time of Max Occurrence hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
1	CONDUIT	0.149	0	19:08	0.52	0.03	0.16
3	CONDUIT	0.362	0	16:21	0.96	0.10	0.19
4	CONDUIT	0.485	1	03:43	0.43	0.05	0.56

****
Flow Classification Summary

****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
1	1.00	0.07	0.01	0.00	0.91	0.00	0.00	0.00	0.91	0.00
3	1.00	0.07	0.00	0.00	0.67	0.00	0.00	0.25	0.62	0.00
4	1.00	0.06	0.04	0.00	0.90	0.00	0.00	0.00	0.90	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Apr 17 14:21:11 2014
Analysis ended on: Thu Apr 17 14:21:11 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.001)

NOTE: The summary statistics displayed in this report are based on results found at every computational time step, not just on results from each reporting time step.

Analysis Options

Flow Units	CMS
Process Models:	
Rainfall/Runoff	YES
Snowmelt	NO
Groundwater	NO
Flow Routing	YES
Ponding Allowed	NO
Water Quality	NO
Infiltration Method	CURVE_NUMBER
Flow Routing Method	DYNWAVE
Starting Date	JAN-01-2014 00:00:00
Ending Date	JAN-04-2014 00:00:00
Antecedent Dry Days	0.0
Report Time Step	00:15:00
Wet Time Step	00:05:00
Dry Time Step	00:05:00
Routing Time Step	30.00 sec
Variable Time Step	YES
Maximum Trials	8
Head Tolerance	0.016404 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	136.908	56.861
Evaporation Loss	0.000	0.000
Infiltration Loss	86.976	36.123
Surface Runoff	48.717	20.233
Final Surface Storage	1.222	0.508
Continuity Error (%)	-0.005	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	48.715	487.154
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.000	0.000
Internal Outflow	26.218	262.178
Evaporation Loss	0.000	0.000
Seepage Loss	0.000	0.000
Initial Stored Volume	1491.048	14910.631
Final Stored Volume	1513.541	15135.564
Continuity Error (%)	0.000	

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
All links are stable.

****
Routing Time Step Summary
****

Minimum Time Step	:	30.00 sec
Average Time Step	:	30.00 sec
Maximum Time Step	:	30.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.00
Percent Not Converging	:	0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
DumbellLakeCatchment	56.86	0.00	0.00	35.21	21.20	175.59	5.99	0.373
LegLakeUpstream	56.86	0.00	0.00	35.19	21.22	107.54	3.70	0.373
HarrieLakeCatchment	56.86	0.00	0.00	37.57	18.69	173.02	4.57	0.329
PumphouseLakeCatchment	56.86	0.00	0.00	34.48	22.21	16.91	1.16	0.391
DrumLakeCatchment	56.86	0.00	0.00	36.34	19.99	14.12	0.43	0.352

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
HarrieLakeInflow	JUNCTION	0.84	1.00	531.00	0 12:09
1	OUTFALL	0.00	0.00	0.00	0 00:00

DOutfall	OUTFALL	0.00	0.00	0.00	0	00:00
LegLake	STORAGE	24.86	24.92	736.17	1	02:42
DumbellLake	STORAGE	31.15	31.20	31.20	3	00:00
PumphouseLake	STORAGE	5.04	5.12	747.09	0	17:55
DrumLake	STORAGE	1.85	2.05	740.29	0	16:03

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
HarrieLakeInflow	JUNCTION	4.571	4.633	0 13:30	173	266	0.000
1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
DOutfall	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
LegLake	STORAGE	3.697	3.991	0 13:10	108	7.03e+003	0.003
DumbellLake	STORAGE	5.989	5.989	0 12:55	176	8e+003	-2.147
PumphouseLake	STORAGE	1.165	1.165	0 12:20	16.9	211	0.004
DrumLake	STORAGE	0.426	0.543	0 14:32	14.1	30.1	0.461

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
HarrieLakeInflow	JUNCTION	59.85	0.000	0.000
DumbellLake	STORAGE	72.00	31.199	3.301

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Maximum	Time of Max	Total Flood	Maximum Ponded

Node	Hours Flooded	Rate CMS	Occurrence days	hr:min	Volume 10^6 ltr	Depth Meters
HarrieLakeInflow	59.85	4.633	0	13:30	262.180	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Infil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days	hr:min	Maximum Outflow CMS
LegLake	6945.261	91	0	0	6984.469	91	1	02:42	0.719
DumbellLake	7957.308	73	0	0	8003.207	73	3	00:00	0.000
PumphouseLake	198.032	46	0	0	203.683	47	0	17:55	0.216
DrumLake	0.772	5	0	0	1.889	11	0	16:03	0.520

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
1	0.00	0.000	0.000	0.000
DOutfall	0.00	0.000	0.000	0.000
System	0.00	0.000	0.000	0.000

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
1	CONDUIT	0.216	0	17:56	0.58	0.04	0.20
3	CONDUIT	0.520	0	16:04	1.09	0.14	0.24
4	CONDUIT	0.719	1	02:42	0.62	0.07	0.58

****
Flow Classification Summary

****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
1	1.00	0.07	0.01	0.00	0.92	0.00	0.00	0.00	0.92	0.00
3	1.00	0.07	0.00	0.00	0.69	0.00	0.00	0.24	0.64	0.00
4	1.00	0.05	0.04	0.00	0.91	0.00	0.00	0.00	0.91	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Apr 17 14:21:36 2014
Analysis ended on: Thu Apr 17 14:21:36 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.001)

NOTE: The summary statistics displayed in this report are based on results found at every computational time step, not just on results from each reporting time step.

****
Analysis Options
****

Flow Units	CMS
Process Models:	
Rainfall/Runoff	YES
Snowmelt	NO
Groundwater	NO
Flow Routing	YES
Ponding Allowed	NO
Water Quality	NO
Infiltration Method	CURVE_NUMBER
Flow Routing Method	DYNWAVE
Starting Date	JAN-01-2014 00:00:00
Ending Date	JAN-04-2014 00:00:00
Antecedent Dry Days	0.0
Report Time Step	00:15:00
Wet Time Step	00:05:00
Dry Time Step	00:05:00
Routing Time Step	30.00 sec
Variable Time Step	YES
Maximum Trials	8
Head Tolerance	0.016404 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	147.324	61.187
Evaporation Loss	0.000	0.000
Infiltration Loss	90.981	37.786
Surface Runoff	55.128	22.896
Final Surface Storage	1.224	0.508
Continuity Error (%)	-0.005	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	55.125	551.260
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.000	0.000
Internal Outflow	30.100	301.006
Evaporation Loss	0.000	0.000
Seepage Loss	0.000	0.000
Initial Stored Volume	1491.048	14910.631
Final Stored Volume	1516.068	15160.838
Continuity Error (%)	0.000	

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
All links are stable.

****
Routing Time Step Summary
****

Minimum Time Step	:	30.00 sec
Average Time Step	:	30.00 sec
Maximum Time Step	:	30.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.00
Percent Not Converging	:	0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
DumbellLakeCatchment	61.19	0.00	0.00	36.80	23.93	198.24	7.02	0.391
LegLakeUpstream	61.19	0.00	0.00	36.76	23.97	121.48	4.33	0.392
HarrieLakeCatchment	61.19	0.00	0.00	39.35	21.23	196.58	5.37	0.347
PumphouseLakeCatchment	61.19	0.00	0.00	36.06	24.96	19.00	1.36	0.408
DrumLakeCatchment	61.19	0.00	0.00	38.04	22.63	15.98	0.50	0.370

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
HarrieLakeInflow	JUNCTION	0.84	1.00	531.00	0 12:05
1	OUTFALL	0.00	0.00	0.00	0 00:00

DOutfall	OUTFALL	0.00	0.00	0.00	0	00:00
LegLake	STORAGE	24.87	24.94	736.19	1	02:18
DumbellLake	STORAGE	31.17	31.22	31.22	3	00:00
PumphouseLake	STORAGE	5.05	5.13	747.10	0	17:35
DrumLake	STORAGE	1.85	2.08	740.32	0	16:07

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
HarrieLakeInflow	JUNCTION	5.375	5.449	0 13:25	197	304	0.000
1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
DOutfall	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
LegLake	STORAGE	4.330	4.670	0 13:05	121	7.04e+003	0.003
DumbellLake	STORAGE	7.015	7.015	0 12:50	198	8.03e+003	-2.410
PumphouseLake	STORAGE	1.359	1.359	0 12:20	19	214	0.004
DrumLake	STORAGE	0.500	0.638	0 14:23	16	34.1	0.447

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
HarrieLakeInflow	JUNCTION	59.92	0.000	0.000
DumbellLake	STORAGE	72.00	31.224	3.276

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Type	Maximum	Time of Max	Total Flood	Maximum Ponded

Node	Hours Flooded	Rate CMS	Occurrence days	hr:min	Volume 10^6 ltr	Depth Meters
HarrieLakeInflow	59.92	5.449	0	13:25	301.009	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Infil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days	hr:min	Maximum Outflow CMS
LegLake	6950.835	91	0	0	6995.978	92	1	02:18	0.859
DumbellLake	7974.721	73	0	0	8025.857	73	3	00:00	0.000
PumphouseLake	198.284	46	0	0	204.658	47	0	17:35	0.254
DrumLake	0.818	5	0	0	2.230	13	0	16:07	0.602

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
1	0.00	0.000	0.000	0.000
DOutfall	0.00	0.000	0.000	0.000
System	0.00	0.000	0.000	0.000

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
1	CONDUIT	0.254	0	17:35	0.61	0.05	0.22
3	CONDUIT	0.602	0	16:07	1.15	0.16	0.26
4	CONDUIT	0.859	1	02:18	0.73	0.08	0.59

****
Flow Classification Summary

****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
1	1.00	0.06	0.01	0.00	0.92	0.00	0.00	0.00	0.92	0.00
3	1.00	0.06	0.00	0.00	0.70	0.00	0.00	0.24	0.64	0.00
4	1.00	0.05	0.04	0.00	0.91	0.00	0.00	0.00	0.91	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Apr 17 14:22:11 2014
Analysis ended on: Thu Apr 17 14:22:11 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.001)

NOTE: The summary statistics displayed in this report are based on results found at every computational time step, not just on results from each reporting time step.

Analysis Options

Flow Units	CMS
Process Models:	
Rainfall/Runoff	YES
Snowmelt	NO
Groundwater	NO
Flow Routing	YES
Ponding Allowed	NO
Water Quality	NO
Infiltration Method	CURVE_NUMBER
Flow Routing Method	DYNWAVE
Starting Date	JAN-01-2014 00:00:00
Ending Date	JAN-04-2014 00:00:00
Antecedent Dry Days	0.0
Report Time Step	00:15:00
Wet Time Step	00:05:00
Dry Time Step	00:05:00
Routing Time Step	30.00 sec
Variable Time Step	YES
Maximum Trials	8
Head Tolerance	0.016404 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	159.751	66.348
Evaporation Loss	0.000	0.000
Infiltration Loss	94.481	39.240
Surface Runoff	64.035	26.595
Final Surface Storage	1.246	0.518
Continuity Error (%)	-0.008	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	64.033	640.335
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.000	0.000
Internal Outflow	35.589	355.895
Evaporation Loss	0.000	0.000
Seepage Loss	0.000	0.000
Initial Stored Volume	1491.048	14910.631
Final Stored Volume	1519.486	15195.015
Continuity Error (%)	0.000	

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
All links are stable.

****
Routing Time Step Summary
****

Minimum Time Step	:	30.00 sec
Average Time Step	:	30.00 sec
Maximum Time Step	:	30.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.00
Percent Not Converging	:	0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
DumbellLakeCatchment	66.35	0.00	0.00	38.20	27.69	229.37	9.53	0.417
LegLakeUpstream	66.35	0.00	0.00	38.17	27.72	140.49	5.89	0.418
HarrieLakeCatchment	66.35	0.00	0.00	40.87	24.86	230.19	7.24	0.375
PumphouseLakeCatchment	66.35	0.00	0.00	37.65	28.53	21.72	1.88	0.430
DrumLakeCatchment	66.35	0.00	0.00	39.48	26.34	18.60	0.68	0.397

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
HarrieLakeInflow	JUNCTION	0.84	1.00	531.00	0 12:04
1	OUTFALL	0.00	0.00	0.00	0 00:00

DOutfall	OUTFALL	0.00	0.00	0.00	0	00:00
LegLake	STORAGE	24.88	24.97	736.22	1	01:33
DumbellLake	STORAGE	31.19	31.26	31.26	3	00:00
PumphouseLake	STORAGE	5.05	5.15	747.12	0	16:41
DrumLake	STORAGE	1.86	2.13	740.36	0	15:54

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
HarrieLakeInflow	JUNCTION	7.241	7.316	0 13:05	230	359	0.000
1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
DOutfall	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
LegLake	STORAGE	5.888	6.280	0 12:50	140	7.07e+003	0.004
DumbellLake	STORAGE	9.534	9.534	0 12:40	229	8.06e+003	-2.768
PumphouseLake	STORAGE	1.884	1.884	0 12:15	21.7	216	0.004
DrumLake	STORAGE	0.677	0.836	0 13:50	18.6	39.4	0.432

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
HarrieLakeInflow	JUNCTION	59.93	0.000	0.000
DumbellLake	STORAGE	72.00	31.259	3.241

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Type	Maximum Flooding Rate CMS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters

Node	Hours Flooded	Rate CMS	Occurrence days	Occurrence hr:min	Volume 10^6 ltr	Depth Meters
HarrieLakeInflow	59.93	7.316	0	13:05	355.898	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Infil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days	Time of Max Occurrence hr:min	Maximum Outflow CMS
LegLake	6958.167	91	0	0	7010.593	92	1	01:33	1.048
DumbellLake	7999.134	73	0	0	8056.980	74	3	00:00	0.000
PumphouseLake	198.574	46	0	0	206.271	48	0	16:41	0.321
DrumLake	0.897	5	0	0	3.010	18	0	15:54	0.752

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
1	0.00	0.000	0.000	0.000
DOutfall	0.00	0.000	0.000	0.000
System	0.00	0.000	0.000	0.000

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days	Time of Max Occurrence hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
1	CONDUIT	0.321	0	16:42	0.65	0.06	0.26
3	CONDUIT	0.752	0	15:54	1.24	0.20	0.30
4	CONDUIT	1.048	1	01:33	0.87	0.10	0.60

****
Flow Classification Summary

****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
1	1.00	0.07	0.01	0.00	0.92	0.00	0.00	0.00	0.92	0.00
3	1.00	0.07	0.00	0.00	0.71	0.00	0.00	0.23	0.66	0.00
4	1.00	0.05	0.04	0.00	0.91	0.00	0.00	0.00	0.91	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Apr 17 14:22:33 2014
Analysis ended on: Thu Apr 17 14:22:33 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.001)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date JAN-01-2014 00:00:00
Ending Date JAN-04-2014 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:15:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Head Tolerance ..... 0.016404 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	85.599	34.480
Evaporation Loss	0.000	0.000
Infiltration Loss	63.703	25.660
Surface Runoff	20.610	8.302
Final Surface Storage	1.288	0.519
Continuity Error (%)	-0.002	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	20.608	206.082
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.000	0.000
Internal Outflow	11.555	115.550
Evaporation Loss	0.000	0.000
Seepage Loss	0.000	0.000
Initial Stored Volume	708.373	7083.802
Final Stored Volume	717.424	7174.311
Continuity Error (%)	0.000	

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
All links are stable.

****
Routing Time Step Summary
****

Minimum Time Step	:	30.00 sec
Average Time Step	:	30.00 sec
Maximum Time Step	:	30.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.00
Percent Not Converging	:	0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
DumbellLakeCatchment	34.48	0.00	0.00	25.00	9.09	64.69	1.53	0.264
LegLakeUpstream	34.48	0.00	0.00	28.72	5.31	29.73	0.56	0.154
HarrieLakeCatchment	34.48	0.00	0.00	26.91	7.01	62.71	1.17	0.203
PumphouseLakeCatchment	34.48	0.00	0.00	23.71	10.65	4.50	0.25	0.309
DrumLakeCatchment	34.48	0.00	0.00	25.23	8.90	3.99	0.10	0.258
Wabush3Phase1	34.48	0.00	0.00	15.85	17.60	40.49	0.67	0.511

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min

HarrieLakeInflow	JUNCTION	0.83	1.00	531.00	0	13:00
PitInflow	JUNCTION	0.00	0.00	0.00	0	00:00
1	OUTFALL	0.00	0.00	0.00	0	00:00
DOutfall	OUTFALL	0.00	0.00	0.00	0	00:00
LegLake	STORAGE	24.79	24.81	736.06	1	07:58
DumbellLake	STORAGE	7.13	8.92	8.92	3	00:00
PumphouseLake	STORAGE	5.02	5.04	747.01	0	23:49
DrumLake	STORAGE	1.80	1.87	740.11	0	16:30

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
HarrieLakeInflow	JUNCTION	1.166	1.177	0 15:40	62.7	78.6	0.000
PitInflow	JUNCTION	0.671	0.671	0 14:40	40.5	40.5	0.000
1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
DOutfall	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
LegLake	STORAGE	0.561	0.666	0 15:40	29.7	6.93e+003	0.002
DumbellLake	STORAGE	1.530	1.530	0 13:50	64.7	64.7	-49.997
PumphouseLake	STORAGE	0.255	0.255	0 12:25	4.5	199	0.003
DrumLake	STORAGE	0.099	0.113	0 14:40	3.99	8.02	0.692

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
HarrieLakeInflow	JUNCTION	59.01	0.000	0.000
PitInflow	JUNCTION	72.00	0.000	0.000
DumbellLake	STORAGE	72.00	8.915	22.085

****
Node Flooding Summary

****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CMS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
HarrieLakeInflow	59.01	1.177	0 15:40	75.069	0.000
PitInflow	69.65	0.671	0 14:40	40.482	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Infil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
LegLake	6908.209	90	0	0	6916.688	91	1 07:58	0.097
DumbellLake	46.033	1	0	0	64.681	1	3 00:00	0.000
PumphouseLake	196.062	46	0	0	197.474	46	0 23:49	0.034
DrumLake	0.564	3	0	0	0.839	5	0 16:30	0.108

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
1	0.00	0.000	0.000	0.000
DOutfall	0.00	0.000	0.000	0.000
System	0.00	0.000	0.000	0.000

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth

1	CONDUIT	0.034	0	23:49	0.32	0.01	0.07
3	CONDUIT	0.108	0	16:30	0.61	0.03	0.09
4	CONDUIT	0.097	1	07:59	0.09	0.01	0.52

****
Flow Classification Summary
****

Inlet Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Ctrl
1	1.00	0.08	0.01	0.00	0.90	0.00	0.00	0.00	0.90	0.00
3	1.00	0.08	0.00	0.00	0.63	0.00	0.00	0.29	0.55	0.00
4	1.00	0.07	0.06	0.00	0.87	0.00	0.00	0.00	0.87	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Apr 17 14:23:02 2014
Analysis ended on: Thu Apr 17 14:23:02 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.001)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date JAN-01-2014 00:00:00
Ending Date JAN-04-2014 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:15:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Head Tolerance ..... 0.016404 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	105.899	42.657
Evaporation Loss	0.000	0.000
Infiltration Loss	73.505	29.608
Surface Runoff	31.064	12.513
Final Surface Storage	1.334	0.537
Continuity Error (%)	-0.003	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	31.062	310.619
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.000	0.000
Internal Outflow	18.143	181.436
Evaporation Loss	0.000	0.000
Seepage Loss	0.000	0.000
Initial Stored Volume	708.373	7083.802
Final Stored Volume	721.290	7212.970
Continuity Error (%)	0.000	

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
All links are stable.

****
Routing Time Step Summary
****
Minimum Time Step : 30.00 sec
Average Time Step : 30.00 sec
Maximum Time Step : 30.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 2.00
Percent Not Converging : 0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
DumbellLakeCatchment	42.66	0.00	0.00	28.68	13.58	96.63	2.94	0.318
LegLakeUpstream	42.66	0.00	0.00	33.88	8.32	46.56	1.07	0.195
HarrieLakeCatchment	42.66	0.00	0.00	31.13	10.95	97.92	2.18	0.257
PumphouseLakeCatchment	42.66	0.00	0.00	27.34	15.20	6.43	0.52	0.356
DrumLakeCatchment	42.66	0.00	0.00	29.04	13.26	5.95	0.19	0.311
Wabush3Phase1	42.66	0.00	0.00	16.70	24.85	57.16	1.14	0.583

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min

HarrieLakeInflow	JUNCTION	0.83	1.00	531.00	0	12:30
PitInflow	JUNCTION	0.00	0.00	0.00	0	00:00
1	OUTFALL	0.00	0.00	0.00	0	00:00
DOutfall	OUTFALL	0.00	0.00	0.00	0	00:00
LegLake	STORAGE	24.81	24.83	736.08	1	04:51
DumbellLake	STORAGE	7.92	9.82	9.82	3	00:00
PumphouseLake	STORAGE	5.02	5.05	747.02	0	19:45
DrumLake	STORAGE	1.81	1.92	740.16	0	15:14

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
HarrieLakeInflow	JUNCTION	2.181	2.194	0 14:05	97.9	128	0.000
PitInflow	JUNCTION	1.142	1.142	0 13:40	57.2	57.2	0.000
1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
DOutfall	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
LegLake	STORAGE	1.074	1.256	0 14:20	46.6	6.95e+003	0.002
DumbellLake	STORAGE	2.941	2.941	0 13:05	96.6	96.6	-49.997
PumphouseLake	STORAGE	0.516	0.516	0 12:15	6.43	201	0.003
DrumLake	STORAGE	0.191	0.212	0 13:35	5.95	11.8	0.624

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
HarrieLakeInflow	JUNCTION	59.51	0.000	0.000
PitInflow	JUNCTION	72.00	0.000	0.000
DumbellLake	STORAGE	72.00	9.821	21.179

****
Node Flooding Summary

****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CMS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
HarrieLakeInflow	59.51	2.194	0 14:05	124.281	0.000
PitInflow	69.68	1.142	0 13:40	57.156	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Infil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
LegLake	6917.121	91	0	0	6932.057	91	1 04:51	0.200
DumbellLake	70.409	1	0	0	96.622	1	3 00:00	0.000
PumphouseLake	196.461	46	0	0	198.569	46	0 19:45	0.057
DrumLake	0.601	4	0	0	1.053	6	0 15:14	0.197

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
1	0.00	0.000	0.000	0.000
DOutfall	0.00	0.000	0.000	0.000
System	0.00	0.000	0.000	0.000

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth

1	CONDUIT	0.057	0	19:45	0.39	0.01	0.10
3	CONDUIT	0.197	0	15:14	0.77	0.05	0.13
4	CONDUIT	0.200	1	04:51	0.19	0.02	0.54

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
1	1.00	0.08	0.01	0.00	0.91	0.00	0.00	0.00	0.91	0.00
3	1.00	0.08	0.00	0.00	0.66	0.00	0.00	0.26	0.61	0.00
4	1.00	0.07	0.06	0.00	0.87	0.00	0.00	0.00	0.87	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Apr 17 14:23:25 2014
Analysis ended on: Thu Apr 17 14:23:25 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.001)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date JAN-01-2014 00:00:00
Ending Date JAN-04-2014 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:15:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Head Tolerance ..... 0.016404 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	121.115	48.786
Evaporation Loss	0.000	0.000
Infiltration Loss	80.386	32.380
Surface Runoff	39.385	15.865
Final Surface Storage	1.349	0.543
Continuity Error (%)	-0.004	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	39.382	393.828
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.000	0.000
Internal Outflow	23.475	234.750
Evaporation Loss	0.000	0.000
Seepage Loss	0.000	0.000
Initial Stored Volume	708.373	7083.802
Final Stored Volume	724.281	7242.885
Continuity Error (%)	-0.000	

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
All links are stable.

****
Routing Time Step Summary
****
Minimum Time Step : 30.00 sec
Average Time Step : 30.00 sec
Maximum Time Step : 30.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 2.00
Percent Not Converging : 0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
DumbellLakeCatchment	48.79	0.00	0.00	31.23	17.16	122.09	4.06	0.352
LegLakeUpstream	48.79	0.00	0.00	37.52	10.80	60.46	1.51	0.221
HarrieLakeCatchment	48.79	0.00	0.00	34.10	14.10	126.14	3.03	0.289
PumphouseLakeCatchment	48.79	0.00	0.00	29.78	18.89	7.99	0.71	0.387
DrumLakeCatchment	48.79	0.00	0.00	31.69	16.74	7.51	0.26	0.343
Wabush3Phase1	48.79	0.00	0.00	17.36	30.29	69.67	1.49	0.621

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min

HarrieLakeInflow	JUNCTION	0.84	1.00	531.00	0	12:18
PitInflow	JUNCTION	0.00	0.00	0.00	0	00:00
1	OUTFALL	0.00	0.00	0.00	0	00:00
DOutfall	OUTFALL	0.00	0.00	0.00	0	00:00
LegLake	STORAGE	24.82	24.85	736.10	1	04:06
DumbellLake	STORAGE	8.43	10.38	10.38	3	00:00
PumphouseLake	STORAGE	5.03	5.06	747.03	0	18:47
DrumLake	STORAGE	1.82	1.95	740.19	0	14:53

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
HarrieLakeInflow	JUNCTION	3.028	3.046	0 13:45	126	169	0.000
PitInflow	JUNCTION	1.491	1.491	0 13:25	69.7	69.7	0.000
1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
DOutfall	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
LegLake	STORAGE	1.511	1.757	0 14:00	60.5	6.96e+003	0.003
DumbellLake	STORAGE	4.057	4.057	0 12:55	122	122	-49.997
PumphouseLake	STORAGE	0.707	0.707	0 12:15	7.99	203	0.003
DrumLake	STORAGE	0.264	0.293	0 13:20	7.51	14.9	0.579

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
HarrieLakeInflow	JUNCTION	59.70	0.000	0.000
PitInflow	JUNCTION	72.00	0.000	0.000
DumbellLake	STORAGE	72.00	10.380	20.620

****
Node Flooding Summary

****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CMS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
HarrieLakeInflow	59.70	3.046	0 13:45	165.087	0.000
PitInflow	70.00	1.491	0 13:25	69.665	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Infil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
LegLake	6923.800	91	0	0	6944.265	91	1 04:06	0.300
DumbellLake	89.874	1	0	0	122.083	2	3 00:00	0.000
PumphouseLake	196.745	46	0	0	199.426	46	0 18:47	0.079
DrumLake	0.630	4	0	0	1.219	7	0 14:53	0.269

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
1	0.00	0.000	0.000	0.000
DOutfall	0.00	0.000	0.000	0.000
System	0.00	0.000	0.000	0.000

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth

1	CONDUIT	0.079	0	18:47	0.43	0.02	0.12
3	CONDUIT	0.269	0	14:53	0.86	0.07	0.16
4	CONDUIT	0.300	1	04:06	0.27	0.03	0.55

****
Flow Classification Summary
****

Inlet Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Ctrl
1	1.00	0.07	0.01	0.00	0.91	0.00	0.00	0.00	0.92	0.00
3	1.00	0.07	0.00	0.00	0.68	0.00	0.00	0.25	0.63	0.00
4	1.00	0.06	0.06	0.00	0.88	0.00	0.00	0.00	0.88	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Apr 17 14:23:53 2014
Analysis ended on: Thu Apr 17 14:23:53 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.001)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date JAN-01-2014 00:00:00
Ending Date JAN-04-2014 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:15:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Head Tolerance ..... 0.016404 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	141.162	56.861
Evaporation Loss	0.000	0.000
Infiltration Loss	88.304	35.570
Surface Runoff	51.489	20.740
Final Surface Storage	1.376	0.554
Continuity Error (%)	-0.005	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	51.486	514.865
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.000	0.000
Internal Outflow	31.365	313.649
Evaporation Loss	0.000	0.000
Seepage Loss	0.000	0.000
Initial Stored Volume	708.373	7083.802
Final Stored Volume	728.492	7284.998
Continuity Error (%)	0.000	

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
All links are stable.

****
Routing Time Step Summary
****
Minimum Time Step : 30.00 sec
Average Time Step : 30.00 sec
Maximum Time Step : 30.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 2.00
Percent Not Converging : 0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
DumbellLakeCatchment	56.86	0.00	0.00	34.14	22.32	158.82	6.05	0.393
LegLakeUpstream	56.86	0.00	0.00	41.87	14.52	81.27	2.30	0.255
HarrieLakeCatchment	56.86	0.00	0.00	37.47	18.79	168.09	4.53	0.331
PumphouseLakeCatchment	56.86	0.00	0.00	32.63	24.12	10.19	1.04	0.424
DrumLakeCatchment	56.86	0.00	0.00	34.73	21.77	9.77	0.39	0.383
Wabush3Phase1	56.86	0.00	0.00	17.96	37.72	86.76	2.07	0.663

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min

HarrieLakeInflow	JUNCTION	0.84	1.00	531.00	0	12:09
PitInflow	JUNCTION	0.00	0.00	0.00	0	00:00
1	OUTFALL	0.00	0.00	0.00	0	00:00
DOutfall	OUTFALL	0.00	0.00	0.00	0	00:00
LegLake	STORAGE	24.84	24.88	736.13	1	03:14
DumbellLake	STORAGE	9.04	11.06	11.06	3	00:00
PumphouseLake	STORAGE	5.03	5.08	747.05	0	17:34
DrumLake	STORAGE	1.83	2.00	740.24	0	14:30

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
HarrieLakeInflow	JUNCTION	4.528	4.553	0 13:25	168	230	0.000
PitInflow	JUNCTION	2.069	2.069	0 13:10	86.8	86.8	0.000
1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
DOutfall	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
LegLake	STORAGE	2.300	2.646	0 13:37	81.3	6.99e+003	0.003
DumbellLake	STORAGE	6.048	6.048	0 12:45	159	159	-49.997
PumphouseLake	STORAGE	1.040	1.040	0 12:15	10.2	205	0.003
DrumLake	STORAGE	0.395	0.437	0 13:05	9.77	19.3	0.535

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
HarrieLakeInflow	JUNCTION	59.85	0.000	0.000
PitInflow	JUNCTION	72.00	0.000	0.000
DumbellLake	STORAGE	72.00	11.057	19.943

****
Node Flooding Summary

****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CMS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
HarrieLakeInflow	59.85	4.553	0 13:25	226.899	0.000
PitInflow	70.20	2.069	0 13:10	86.752	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Infil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
LegLake	6933.016	91	0	0	6961.700	91	1 03:14	0.467
DumbellLake	118.232	2	0	0	158.809	2	3 00:00	0.000
PumphouseLake	197.103	46	0	0	200.664	47	0 17:34	0.113
DrumLake	0.668	4	0	0	1.495	9	0 14:30	0.392

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
1	0.00	0.000	0.000	0.000
DOutfall	0.00	0.000	0.000	0.000
System	0.00	0.000	0.000	0.000

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth

1	CONDUIT	0.113	0	17:34	0.47	0.02	0.16
3	CONDUIT	0.392	0	14:31	0.99	0.10	0.20
4	CONDUIT	0.467	1	03:15	0.42	0.05	0.56

****
Flow Classification Summary
****

Inlet Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
1	1.00	0.07	0.01	0.00	0.92	0.00	0.00	0.00	0.92	0.00
3	1.00	0.07	0.00	0.00	0.70	0.00	0.00	0.23	0.65	0.00
4	1.00	0.05	0.05	0.00	0.89	0.00	0.00	0.00	0.89	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Apr 17 14:24:15 2014
Analysis ended on: Thu Apr 17 14:24:15 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.001)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date JAN-01-2014 00:00:00
Ending Date JAN-04-2014 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:15:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Head Tolerance ..... 0.016404 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	151.902	61.187
Evaporation Loss	0.000	0.000
Infiltration Loss	92.456	37.242
Surface Runoff	58.079	23.395
Final Surface Storage	1.375	0.554
Continuity Error (%)	-0.005	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	58.077	580.773
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.000	0.000
Internal Outflow	35.686	356.861
Evaporation Loss	0.000	0.000
Seepage Loss	0.000	0.000
Initial Stored Volume	708.373	7083.802
Final Stored Volume	730.762	7307.694
Continuity Error (%)	0.000	

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
All links are stable.

****
Routing Time Step Summary
****
Minimum Time Step : 30.00 sec
Average Time Step : 30.00 sec
Maximum Time Step : 30.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 2.00
Percent Not Converging : 0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
DumbellLakeCatchment	61.19	0.00	0.00	35.64	25.15	178.93	7.07	0.411
LegLakeUpstream	61.19	0.00	0.00	44.13	16.59	92.86	2.72	0.271
HarrieLakeCatchment	61.19	0.00	0.00	39.27	21.33	190.77	5.32	0.349
PumphouseLakeCatchment	61.19	0.00	0.00	34.05	27.03	11.43	1.21	0.442
DrumLakeCatchment	61.19	0.00	0.00	36.29	24.54	11.01	0.46	0.401
Wabush3Phase1	61.19	0.00	0.00	18.34	41.66	95.81	2.35	0.681

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min

HarrieLakeInflow	JUNCTION	0.84	1.00	531.00	0	12:05
PitInflow	JUNCTION	0.00	0.00	0.00	0	00:00
1	OUTFALL	0.00	0.00	0.00	0	00:00
DOutfall	OUTFALL	0.00	0.00	0.00	0	00:00
LegLake	STORAGE	24.84	24.90	736.15	1	02:50
DumbellLake	STORAGE	9.33	11.38	11.38	3	00:00
PumphouseLake	STORAGE	5.04	5.09	747.06	0	17:15
DrumLake	STORAGE	1.83	2.03	740.26	0	14:29

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
HarrieLakeInflow	JUNCTION	5.324	5.353	0 13:20	191	265	0.000
PitInflow	JUNCTION	2.353	2.353	0 13:05	95.8	95.8	0.000
1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
DOutfall	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
LegLake	STORAGE	2.725	3.123	0 13:30	92.9	7e+003	0.003
DumbellLake	STORAGE	7.069	7.069	0 12:40	179	179	-49.997
PumphouseLake	STORAGE	1.210	1.210	0 12:10	11.4	206	0.003
DrumLake	STORAGE	0.462	0.512	0 13:00	11	21.7	0.518

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
HarrieLakeInflow	JUNCTION	59.92	0.000	0.000
PitInflow	JUNCTION	72.00	0.000	0.000
DumbellLake	STORAGE	72.00	11.379	19.621

****
Node Flooding Summary

****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CMS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
HarrieLakeInflow	59.92	5.353	0 13:20	261.055	0.000
PitInflow	70.38	2.353	0 13:05	95.808	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Infil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
LegLake	6937.823	91	0	0	6971.290	91	1 02:50	0.569
DumbellLake	133.766	2	0	0	178.919	2	3 00:00	0.000
PumphouseLake	197.289	46	0	0	201.302	47	0 17:15	0.133
DrumLake	0.690	4	0	0	1.658	10	0 14:29	0.453

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
1	0.00	0.000	0.000	0.000
DOutfall	0.00	0.000	0.000	0.000
System	0.00	0.000	0.000	0.000

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth

1	CONDUIT	0.133	0	17:15	0.50	0.03	0.17
3	CONDUIT	0.453	0	14:29	1.04	0.12	0.22
4	CONDUIT	0.569	1	02:50	0.50	0.06	0.57

****
Flow Classification Summary
****

Inlet Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Ctrl
1	1.00	0.06	0.01	0.00	0.93	0.00	0.00	0.00	0.93	0.00
3	1.00	0.06	0.00	0.00	0.71	0.00	0.00	0.23	0.66	0.00
4	1.00	0.05	0.05	0.00	0.90	0.00	0.00	0.00	0.90	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Apr 17 14:24:41 2014
Analysis ended on: Thu Apr 17 14:24:41 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.001)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date JAN-01-2014 00:00:00
Ending Date JAN-04-2014 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:15:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Head Tolerance ..... 0.016404 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	164.714	66.348
Evaporation Loss	0.000	0.000
Infiltration Loss	96.104	38.711
Surface Runoff	67.209	27.072
Final Surface Storage	1.414	0.570
Continuity Error (%)	-0.007	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	67.206	672.067
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.000	0.000
Internal Outflow	41.782	417.822
Evaporation Loss	0.000	0.000
Seepage Loss	0.000	0.000
Initial Stored Volume	708.373	7083.802
Final Stored Volume	733.794	7338.018
Continuity Error (%)	0.000	

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
All links are stable.

****
Routing Time Step Summary
****

Minimum Time Step	:	30.00 sec
Average Time Step	:	30.00 sec
Maximum Time Step	:	30.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.00
Percent Not Converging	:	0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
DumbellLakeCatchment	66.35	0.00	0.00	36.98	28.97	206.09	9.63	0.437
LegLakeUpstream	66.35	0.00	0.00	46.31	19.56	109.46	3.73	0.295
HarrieLakeCatchment	66.35	0.00	0.00	40.77	24.97	223.35	7.18	0.376
PumphouseLakeCatchment	66.35	0.00	0.00	35.54	30.71	12.98	1.68	0.463
DrumLakeCatchment	66.35	0.00	0.00	37.72	28.27	12.68	0.63	0.426
Wabush3Phase1	66.35	0.00	0.00	18.35	46.75	107.53	3.02	0.705

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min

HarrieLakeInflow	JUNCTION	0.84	1.00	531.00	0	12:04
PitInflow	JUNCTION	0.00	0.00	0.00	0	00:00
1	OUTFALL	0.00	0.00	0.00	0	00:00
DOutfall	OUTFALL	0.00	0.00	0.00	0	00:00
LegLake	STORAGE	24.85	24.92	736.17	1	02:14
DumbellLake	STORAGE	9.66	11.77	11.77	3	00:00
PumphouseLake	STORAGE	5.04	5.10	747.07	0	16:18
DrumLake	STORAGE	1.83	2.07	740.30	0	14:25

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
HarrieLakeInflow	JUNCTION	7.179	7.211	0 13:00	223	314	0.000
PitInflow	JUNCTION	3.016	3.016	0 12:55	108	108	0.000
1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
DOutfall	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
LegLake	STORAGE	3.727	4.193	0 13:10	109	7.02e+003	0.003
DumbellLake	STORAGE	9.632	9.632	0 12:35	206	206	-49.997
PumphouseLake	STORAGE	1.683	1.683	0 12:10	13	208	0.003
DrumLake	STORAGE	0.632	0.692	0 12:46	12.7	24.9	0.502

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
HarrieLakeInflow	JUNCTION	59.93	0.000	0.000
PitInflow	JUNCTION	72.00	0.000	0.000
DumbellLake	STORAGE	72.00	11.770	19.230

****
Node Flooding Summary

****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CMS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
HarrieLakeInflow	59.93	7.210	0 13:00	310.304	0.000
PitInflow	70.20	3.016	0 12:55	107.520	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Infil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
LegLake	6944.374	91	0	0	6983.738	91	1 02:14	0.710
DumbellLake	155.278	2	0	0	206.086	3	3 00:00	0.000
PumphouseLake	197.497	46	0	0	202.364	47	0 16:18	0.168
DrumLake	0.722	4	0	0	2.090	13	0 14:25	0.570

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
1	0.00	0.000	0.000	0.000
DOutfall	0.00	0.000	0.000	0.000
System	0.00	0.000	0.000	0.000

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth

1	CONDUIT	0.168	0	16:18	0.53	0.03	0.20
3	CONDUIT	0.570	0	14:25	1.13	0.15	0.25
4	CONDUIT	0.710	1	02:15	0.61	0.07	0.58

****
Flow Classification Summary
****

Inlet Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
1	1.00	0.07	0.01	0.00	0.92	0.00	0.00	0.00	0.92	0.00
3	1.00	0.07	0.00	0.00	0.72	0.00	0.00	0.21	0.68	0.00
4	1.00	0.05	0.05	0.00	0.89	0.00	0.00	0.00	0.89	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Apr 17 14:25:13 2014
Analysis ended on: Thu Apr 17 14:25:13 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.001)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date JAN-01-2014 00:00:00
Ending Date JAN-04-2014 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:15:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Head Tolerance ..... 0.016404 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	84.820	34.480
Evaporation Loss	0.000	0.000
Infiltration Loss	62.357	25.349
Surface Runoff	21.089	8.573
Final Surface Storage	1.376	0.559
Continuity Error (%)	-0.002	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	21.086	210.865
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	5.512	55.123
Internal Outflow	7.007	70.073
Evaporation Loss	0.000	0.000
Seepage Loss	0.000	0.000
Initial Stored Volume	688.877	6888.845
Final Stored Volume	697.494	6975.013
Continuity Error (%)	-0.007	

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
Link 3 (5)

****
Routing Time Step Summary
****
Minimum Time Step : 30.00 sec
Average Time Step : 30.00 sec
Maximum Time Step : 30.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 2.00
Percent Not Converging : 0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
DumbellLakeCatchment	34.48	0.00	0.00	24.98	9.11	64.07	1.52	0.264
LegLakeUpstream	34.48	0.00	0.00	28.87	5.18	27.57	0.52	0.150
HarrieLakeCatchment	34.48	0.00	0.00	26.83	7.11	60.57	1.15	0.206
PumphouseLakeCatchment	34.48	0.00	0.00	25.24	9.10	1.31	0.06	0.264
DrumLakeCatchment	34.48	0.00	0.00	25.14	9.10	2.67	0.08	0.264
Wabush3Phase1	34.48	0.00	0.00	16.61	16.64	54.70	0.75	0.483

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min

HarrieLakeInflow	JUNCTION	0.83	1.00	531.00	0	13:00
1	OUTFALL	0.00	0.00	0.00	0	00:00
DOutfall	OUTFALL	0.00	0.00	0.00	0	00:00
LegLake	STORAGE	24.79	24.80	736.05	1	05:00
DumbellLake	STORAGE	7.11	8.89	8.89	3	00:00
Pond1	STORAGE	0.58	1.12	1.12	1	09:38

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
HarrieLakeInflow	JUNCTION	1.146	1.156	0 15:25	60.6	73.6	0.000
1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000
DOutfall	OUTFALL	0.000	0.250	0 11:55	0	55.1	0.000
LegLake	STORAGE	0.628	0.628	0 14:20	31.5	6.92e+003	0.002
DumbellLake	STORAGE	1.524	1.524	0 13:45	64.1	64.1	-49.997
Pond1	STORAGE	0.749	0.749	0 15:50	54.7	54.7	-0.893

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
HarrieLakeInflow	JUNCTION	59.01	0.000	0.000
DumbellLake	STORAGE	72.00	8.894	22.106
Pond1	STORAGE	72.00	1.120	3.880

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Type	Maximum Flooding Rate CMS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters

Node	Hours Flooded	Rate CMS	Occurrence days hr:min	Volume 10^6 ltr	Depth Meters
HarrieLakeInflow	59.01	1.156	0 15:25	70.074	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Infil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
LegLake	6906.120	90	0	0	6913.737	90	1 05:00	0.080
DumbellLake	45.622	1	0	0	64.067	1	3 00:00	0.000
Pond1	12.084	12	0	0	23.528	22	1 09:38	0.250

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
1	0.00	0.000	0.000	0.000
DOutfall	86.73	0.245	0.250	55.123
System	43.36	0.245	0.250	55.123

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
4	CONDUIT	0.080	1 05:00	0.08	0.01	0.52
3	DUMMY	0.250	0 11:55			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
4	1.00	0.07	0.05	0.00	0.88	0.00	0.00	0.00	0.88	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Apr 17 14:25:44 2014
Analysis ended on: Thu Apr 17 14:25:44 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.001)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date JAN-01-2014 00:00:00
Ending Date JAN-04-2014 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:15:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Head Tolerance ..... 0.016404 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	104.935	42.657
Evaporation Loss	0.000	0.000
Infiltration Loss	71.691	29.143
Surface Runoff	31.724	12.896
Final Surface Storage	1.524	0.619
Continuity Error (%)	-0.003	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	31.721	317.212
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	5.528	55.284
Internal Outflow	11.519	115.196
Evaporation Loss	0.000	0.000
Seepage Loss	0.000	0.000
Initial Stored Volume	688.877	6888.845
Final Stored Volume	703.600	7036.071
Continuity Error (%)	-0.007	

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
Link 3 (5)

****
Routing Time Step Summary
****
Minimum Time Step : 30.00 sec
Average Time Step : 30.00 sec
Maximum Time Step : 30.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 2.00
Percent Not Converging : 0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
DumbellLakeCatchment	42.66	0.00	0.00	28.66	13.60	95.63	2.93	0.319
LegLakeUpstream	42.66	0.00	0.00	34.12	8.09	43.09	1.00	0.190
HarrieLakeCatchment	42.66	0.00	0.00	31.04	11.06	94.22	2.15	0.259
PumphouseLakeCatchment	42.66	0.00	0.00	29.41	13.12	1.89	0.13	0.307
DrumLakeCatchment	42.66	0.00	0.00	29.06	13.35	3.92	0.16	0.313
Wabush3Phase1	42.66	0.00	0.00	17.17	23.88	78.49	1.25	0.560

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min

HarrieLakeInflow	JUNCTION	0.83	1.00	531.00	0	12:30
1	OUTFALL	0.00	0.00	0.00	0	00:00
DOutfall	OUTFALL	0.00	0.00	0.00	0	00:00
LegLake	STORAGE	24.80	24.83	736.08	1	04:00
DumbellLake	STORAGE	7.91	9.80	9.80	3	00:00
Pond1	STORAGE	1.33	2.09	2.09	1	12:38

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
HarrieLakeInflow	JUNCTION	2.151	2.164	0 14:00	94.2	119	0.000
1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
DOutfall	OUTFALL	0.000	0.250	0 11:46	0	55.3	0.000
LegLake	STORAGE	1.229	1.229	0 13:20	48.9	6.94e+003	0.002
DumbellLake	STORAGE	2.931	2.931	0 13:05	95.6	95.6	-49.997
Pond1	STORAGE	1.247	1.247	0 14:20	78.5	78.5	-0.604

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
HarrieLakeInflow	JUNCTION	59.51	0.000	0.000
DumbellLake	STORAGE	72.00	9.797	21.203
Pond1	STORAGE	72.00	2.090	2.910

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Type	Maximum Flooding Rate CMS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters

Node	Hours Flooded	Rate CMS	Occurrence days hr:min	Volume 10^6 ltr	Depth Meters
HarrieLakeInflow	59.51	2.164	0 14:00	115.197	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Infil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
LegLake	6913.996	90	0	0	6927.350	91	1 04:00	0.166
DumbellLake	69.724	1	0	0	95.620	1	3 00:00	0.000
Pond1	28.009	27	0	0	43.886	42	1 12:38	0.250

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
1	0.00	0.000	0.000	0.000
DOutfall	87.06	0.245	0.250	55.284
System	43.53	0.245	0.250	55.284

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
4	CONDUIT	0.166	1 04:01	0.16	0.02	0.53
3	DUMMY	0.250	0 11:46			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
4	1.00	0.07	0.05	0.00	0.88	0.00	0.00	0.00	0.88	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Apr 17 14:26:17 2014
Analysis ended on: Thu Apr 17 14:26:17 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.001)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date JAN-01-2014 00:00:00
Ending Date JAN-04-2014 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:15:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Head Tolerance ..... 0.016404 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	120.013	48.786
Evaporation Loss	0.000	0.000
Infiltration Loss	78.276	31.820
Surface Runoff	40.151	16.322
Final Surface Storage	1.590	0.646
Continuity Error (%)	-0.004	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	40.148	401.485
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	5.565	55.648
Internal Outflow	15.264	152.638
Evaporation Loss	0.000	0.000
Seepage Loss	0.000	0.000
Initial Stored Volume	688.877	6888.845
Final Stored Volume	708.251	7082.581
Continuity Error (%)	-0.007	

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
Link 3 (6)

****
Routing Time Step Summary
****
Minimum Time Step : 30.00 sec
Average Time Step : 30.00 sec
Maximum Time Step : 30.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 2.00
Percent Not Converging : 0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
DumbellLakeCatchment	48.79	0.00	0.00	31.21	17.18	120.79	4.04	0.352
LegLakeUpstream	48.79	0.00	0.00	37.84	10.50	55.92	1.42	0.215
HarrieLakeCatchment	48.79	0.00	0.00	33.99	14.23	121.28	2.99	0.292
PumphouseLakeCatchment	48.79	0.00	0.00	32.25	16.41	2.36	0.17	0.336
DrumLakeCatchment	48.79	0.00	0.00	31.77	16.77	4.92	0.22	0.344
Wabush3Phase1	48.79	0.00	0.00	17.73	29.28	96.24	1.63	0.600

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min

HarrieLakeInflow	JUNCTION	0.84	1.00	531.00	0	12:18
1	OUTFALL	0.00	0.00	0.00	0	00:00
DOutfall	OUTFALL	0.00	0.00	0.00	0	00:00
LegLake	STORAGE	24.81	24.84	736.09	1	03:23
DumbellLake	STORAGE	8.41	10.35	10.35	3	00:00
Pond1	STORAGE	1.90	2.85	2.85	1	14:21

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
HarrieLakeInflow	JUNCTION	2.986	3.005	0 13:40	121	156	0.000
1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
DOutfall	OUTFALL	0.000	0.250	0 11:25	0	55.6	0.000
LegLake	STORAGE	1.728	1.728	0 13:10	63.2	6.95e+003	0.003
DumbellLake	STORAGE	4.043	4.043	0 12:55	121	121	-49.997
Pond1	STORAGE	1.628	1.628	0 14:05	96.2	96.2	-0.515

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
HarrieLakeInflow	JUNCTION	59.70	0.000	0.000
DumbellLake	STORAGE	72.00	10.354	20.646
Pond1	STORAGE	72.00	2.847	2.153

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Maximum	Time of Max	Total Flood	Maximum Ponded

Node	Hours Flooded	Rate CMS	Occurrence days hr:min	Volume 10^6 ltr	Depth Meters
HarrieLakeInflow	59.70	3.005	0 13:40	152.639	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Infil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days	hr:min	Maximum Outflow CMS
LegLake	6919.922	91	0	0	6938.191	91	1	03:23	0.249
DumbellLake	88.973	1	0	0	120.786	2	3	00:00	0.000
Pond1	39.998	38	0	0	59.787	57	1	14:21	0.250

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
1	0.00	0.000	0.000	0.000
DOutfall	87.93	0.244	0.250	55.648
System	43.96	0.244	0.250	55.648

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days	hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
4	CONDUIT	0.249	1	03:23	0.23	0.02	0.54
3	DUMMY	0.250	0	11:25			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
4	1.00	0.06	0.05	0.00	0.89	0.00	0.00	0.00	0.89	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Apr 17 14:26:46 2014
Analysis ended on: Thu Apr 17 14:26:46 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.001)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CMS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... CURVE_NUMBER
Flow Routing Method ..... DYNWAVE
Starting Date JAN-01-2014 00:00:00
Ending Date JAN-04-2014 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:15:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00
Routing Time Step ..... 30.00 sec
Variable Time Step ..... YES
Maximum Trials 8
Head Tolerance ..... 0.016404 m

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	139.877	56.861
Evaporation Loss	0.000	0.000
Infiltration Loss	85.848	34.898
Surface Runoff	52.352	21.282
Final Surface Storage	1.683	0.684
Continuity Error (%)	-0.005	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	52.349	523.494
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	5.601	56.012
Internal Outflow	20.915	209.156
Evaporation Loss	0.000	0.000
Seepage Loss	0.000	0.000
Initial Stored Volume	688.877	6888.845
Final Stored Volume	714.761	7147.685
Continuity Error (%)	-0.007	

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
Link 3 (6)

****
Routing Time Step Summary
****
Minimum Time Step : 30.00 sec
Average Time Step : 30.00 sec
Maximum Time Step : 30.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 2.00
Percent Not Converging : 0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
DumbellLakeCatchment	56.86	0.00	0.00	34.12	22.34	157.08	6.03	0.393
LegLakeUpstream	56.86	0.00	0.00	42.28	14.13	75.25	2.16	0.248
HarrieLakeCatchment	56.86	0.00	0.00	37.36	18.93	161.26	4.47	0.333
PumphouseLakeCatchment	56.86	0.00	0.00	35.64	21.10	3.03	0.26	0.371
DrumLakeCatchment	56.86	0.00	0.00	34.91	21.70	6.36	0.33	0.382
Wabush3Phase1	56.86	0.00	0.00	18.17	36.68	120.54	2.25	0.645

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min

HarrieLakeInflow	JUNCTION	0.84	1.00	531.00	0	12:09
1	OUTFALL	0.00	0.00	0.00	0	00:00
DOutfall	OUTFALL	0.00	0.00	0.00	0	00:00
LegLake	STORAGE	24.83	24.87	736.12	1	02:40
DumbellLake	STORAGE	9.01	11.03	11.03	3	00:00
Pond1	STORAGE	2.70	3.91	3.91	1	16:04

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
HarrieLakeInflow	JUNCTION	4.468	4.495	0 13:20	161	213	0.000
1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
DOutfall	OUTFALL	0.000	0.250	0 11:02	0	56	0.000
LegLake	STORAGE	2.637	2.637	0 12:55	84.6	6.97e+003	0.003
DumbellLake	STORAGE	6.028	6.028	0 12:45	157	157	-49.997
Pond1	STORAGE	2.252	2.252	0 13:40	121	121	-0.409

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
HarrieLakeInflow	JUNCTION	59.85	0.000	0.000
DumbellLake	STORAGE	72.00	11.027	19.973
Pond1	STORAGE	72.00	3.910	1.090

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Type	Maximum Flooding Rate CMS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters

Node	Hours Flooded	Rate CMS	Occurrence days hr:min	Volume 10^6 ltr	Depth Meters
HarrieLakeInflow	59.85	4.495	0 13:20	209.158	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Infil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
LegLake	6928.158	91	0	0	6953.695	91	1 02:40	0.387
DumbellLake	117.011	1	0	0	157.077	2	3 00:00	0.000
Pond1	56.790	54	0	0	82.108	78	1 16:04	0.250

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
1	0.00	0.000	0.000	0.000
DOutfall	88.65	0.244	0.250	56.012
System	44.32	0.244	0.250	56.012

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
4	CONDUIT	0.387	1 02:40	0.35	0.04	0.56
3	DUMMY	0.250	0 11:02			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
4	1.00	0.05	0.05	0.00	0.90	0.00	0.00	0.00	0.90	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Apr 17 14:27:14 2014
Analysis ended on: Thu Apr 17 14:27:14 2014
Total elapsed time: < 1 sec

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.001)
--------------------------------------------------------------


***********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
***********************************************************

****************
Analysis Options
****************
Flow Units ............... CMS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ JAN-01-2014 00:00:00
Ending Date .............. JAN-04-2014 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:15:00
Wet Time Step ............ 00:05:00
Dry Time Step ............ 00:05:00
Routing Time Step ........ 30.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Head Tolerance ........... 0.016404 m


**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......       150.519        61.187
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........        89.828        36.516
Surface Runoff ...........        59.001        23.984
Final Surface Storage ....         1.698         0.690
Continuity Error (%) .....        -0.005


**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......        58.997       589.979
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         5.633        56.327
Internal Outflow .........        24.056       240.559
Evaporation Loss .........         0.000         0.000
Seepage Loss .............         0.000         0.000
Initial Stored Volume ....       688.877      6888.845
Final Stored Volume ......       718.237      7182.445
Continuity Error (%) .....        -0.007
```

****
Time-Step Critical Elements
****
None

****
Highest Flow Instability Indexes
****
Link 3 (6)

****
Routing Time Step Summary
****
Minimum Time Step : 30.00 sec
Average Time Step : 30.00 sec
Maximum Time Step : 30.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 2.00
Percent Not Converging : 0.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
DumbellLakeCatchment	61.19	0.00	0.00	35.62	25.17	176.96	7.05	0.411
LegLakeUpstream	61.19	0.00	0.00	44.59	16.15	86.01	2.56	0.264
HarrieLakeCatchment	61.19	0.00	0.00	39.13	21.49	183.06	5.25	0.351
PumphouseLakeCatchment	61.19	0.00	0.00	37.33	23.74	3.41	0.30	0.388
DrumLakeCatchment	61.19	0.00	0.00	36.50	24.44	7.17	0.39	0.399
Wabush3Phase1	61.19	0.00	0.00	18.54	40.59	133.40	2.57	0.663

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min

HarrieLakeInflow	JUNCTION	0.84	1.00	531.00	0	12:05
1	OUTFALL	0.00	0.00	0.00	0	00:00
DOutfall	OUTFALL	0.00	0.00	0.00	0	00:00
LegLake	STORAGE	24.83	24.89	736.14	1	02:19
DumbellLake	STORAGE	9.31	11.35	11.35	3	00:00
Pond1	STORAGE	3.13	4.48	4.48	1	16:48

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
HarrieLakeInflow	JUNCTION	5.252	5.285	0 13:15	183	244	0.000
1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000ltr
DOutfall	OUTFALL	0.000	0.250	0 10:54	0	56.3	0.000
LegLake	STORAGE	3.119	3.119	0 12:50	96.6	6.99e+003	0.003
DumbellLake	STORAGE	7.046	7.046	0 12:40	177	177	-49.997
Pond1	STORAGE	2.566	2.566	0 13:35	133	133	-0.362

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
HarrieLakeInflow	JUNCTION	59.92	0.000	0.000
DumbellLake	STORAGE	72.00	11.349	19.651
Pond1	STORAGE	72.00	4.481	0.519

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Maximum	Time of Max	Total Flood	Maximum Ponded

Node	Hours Flooded	Rate CMS	Occurrence days hr:min	Volume 10^6 ltr	Depth Meters
HarrieLakeInflow	59.92	5.285	0 13:15	240.561	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Infil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
LegLake	6932.462	91	0	0	6962.251	91	1 02:19	0.473
DumbellLake	132.373	2	0	0	176.956	2	3 00:00	0.000
Pond1	65.686	63	0	0	94.110	90	1 16:48	0.250

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
1	0.00	0.000	0.000	0.000
DOutfall	89.28	0.243	0.250	56.327
System	44.64	0.243	0.250	56.327

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
4	CONDUIT	0.473	1 02:19	0.42	0.05	0.56
3	DUMMY	0.250	0 10:54			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
4	1.00	0.05	0.05	0.00	0.90	0.00	0.00	0.00	0.90	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Thu Apr 17 14:27:50 2014
Analysis ended on: Thu Apr 17 14:27:50 2014
Total elapsed time: < 1 sec

APPENDIX C

Stage Storage Curves based on Provided Bathymetry Data

Project No: 13-1151-0293
Date: APR.8, 2014
Rev:A
By: TDR

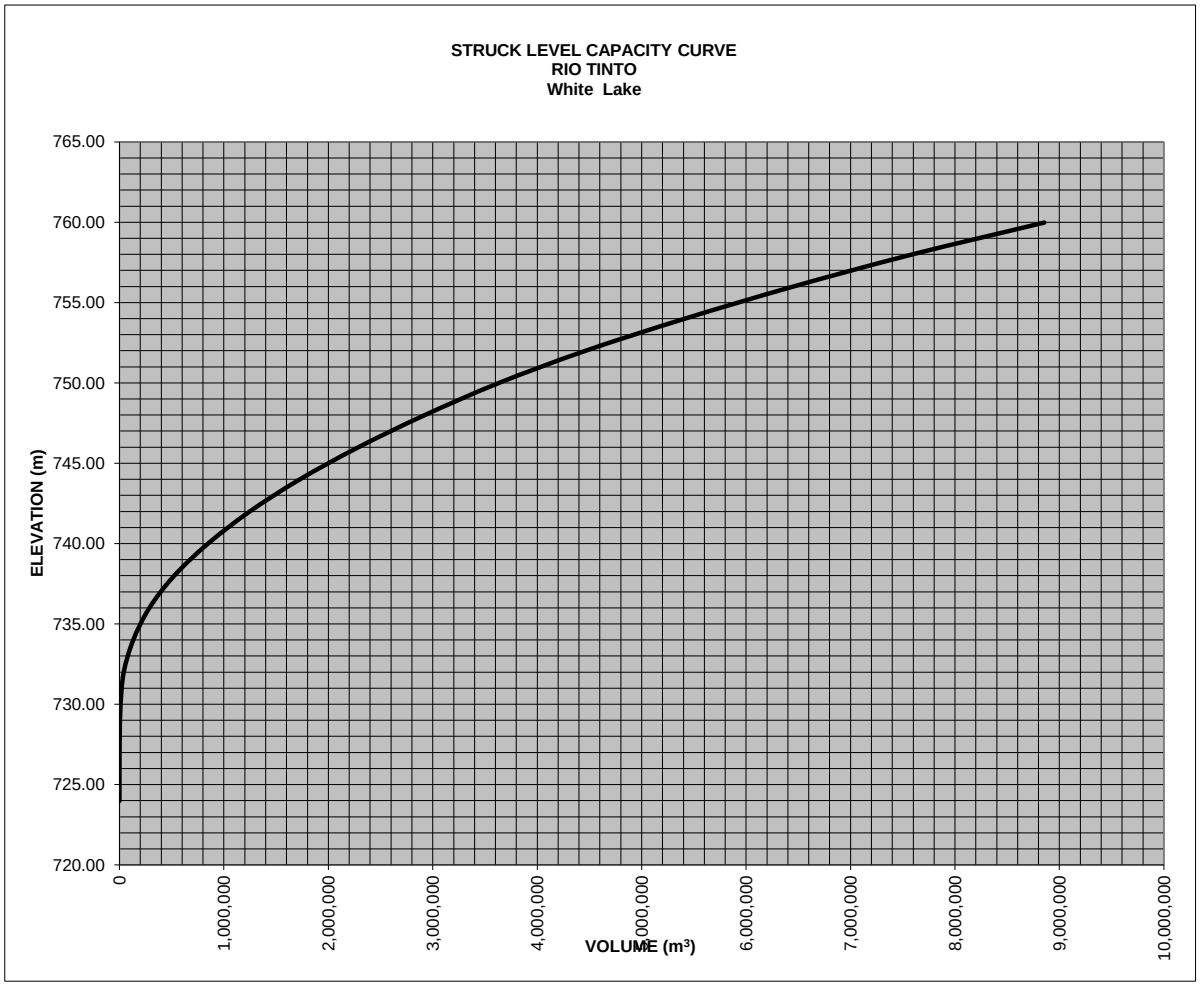
Notes:
1. Bathymetry provided by client. 2m interval

Facility Properties:

Name:	White Lake
Area:	676,556.2
Perimeter:	4,193.4
Max. Elev:	759.98
Min. Elev:	723.98
Max. Depth:	36.00

STRUCK LEVEL CAPACITY CURVE
RIO TINTO
White Lake

Elev. (m)	Volume (m^3)	Area ($m^{2)}$
759.98	8,855,577	676,556
757.98	7,581,145	600,072
755.98	6,442,397	540,808
753.98	5,404,807	497,199
751.98	4,454,096	453,843
749.98	3,627,330	374,867
747.98	2,917,685	335,326
745.98	2,283,141	299,475
743.98	1,722,901	259,693
741.98	1,243,610	220,499
739.98	844,564	180,301
737.98	521,698	140,514
735.98	284,789	96,277
733.98	130,827	60,612
731.98	40,551	27,170
729.98	10,333	7,111
727.98	2,414	2,196
725.98	121	344
723.98	0	3



Project No: 13-1151-0293
Date: APR.4, 2014
Rev:A
By: TDR

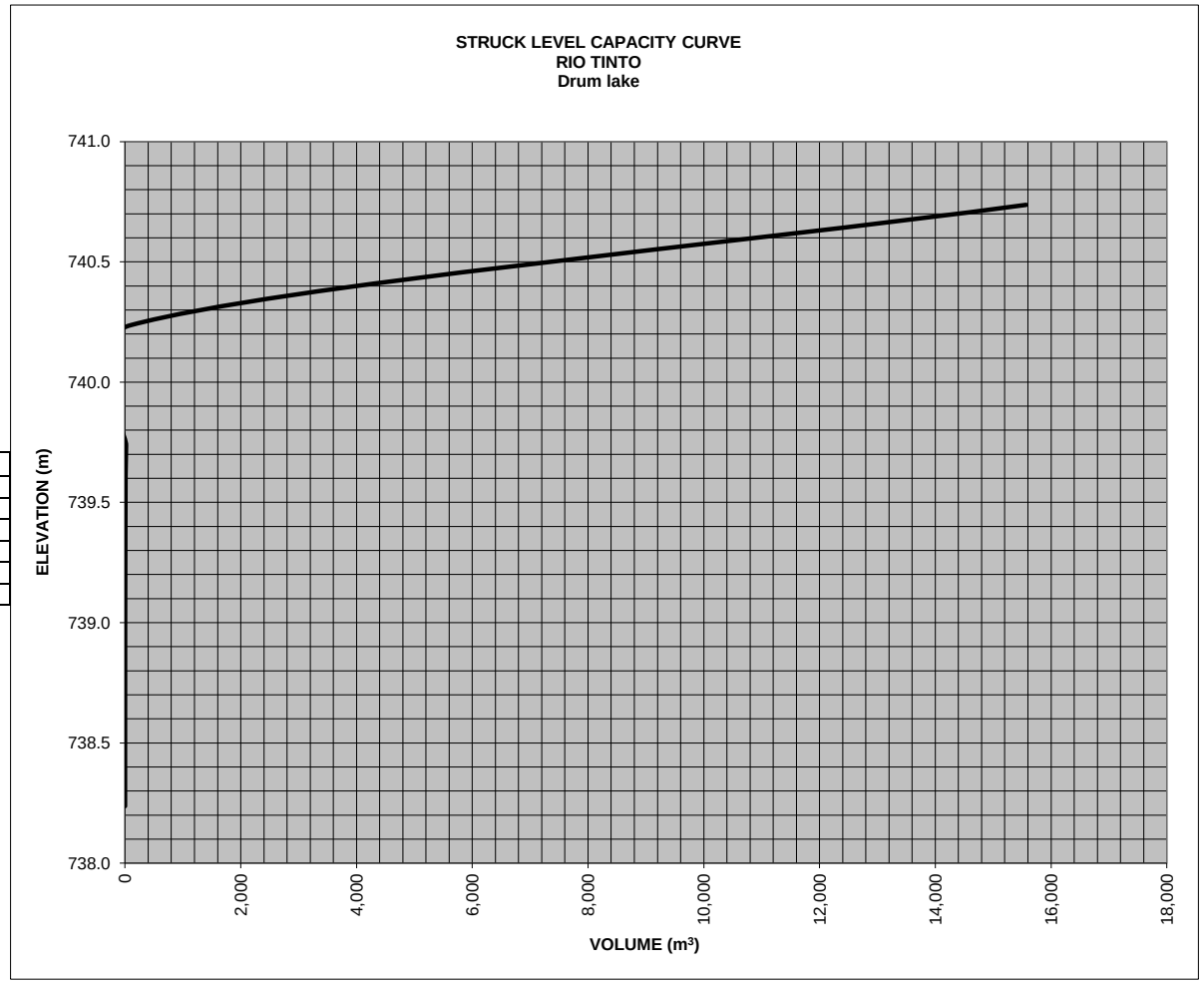
Notes:
1. Bathymetry provided by client

Facility Properties:

Name:	Dumbell Lake
Area:	55,177.9
Perimeter:	1,089.0
Max. Elev:	740.7
Min. Elev:	738.2
Max. Depth:	2.5

STRUCK LEVEL CAPACITY CURVE
RIO TINTO
Drum lake

Elev. (m)	Volume (m^3)	Area ($m^{2)}$
740.7	15,568	55,178
740.2	101	5,779
739.7	19	49
739.2	4	12
738.7	1	4
738.2	0	1



Project No: 13-1151-0293
Date: APR.7, 2014
Rev:A
By: TDR

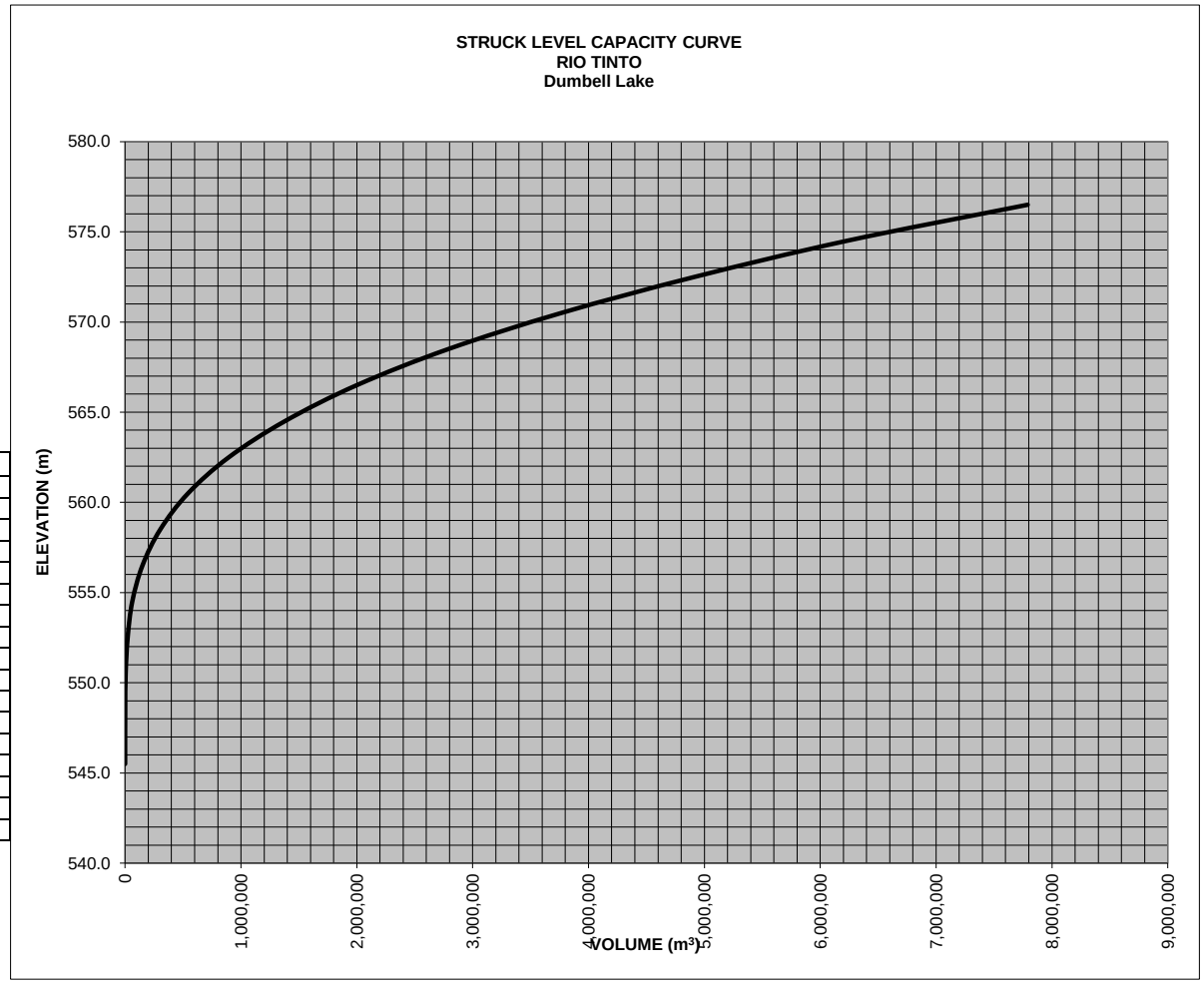
Notes:
1. Bathymetry provided by client

Facility Properties:

Name:	Dumbell Lake
Area:	884,311.2
Perimeter:	6,435.0
Max. Elev:	576.5
Min. Elev:	545.5
Max. Depth:	31.0

STRUCK LEVEL CAPACITY CURVE
RIO TINTO
Drum lake

Elev. (m)	Volume (m^3)	Area ($m^{2)}$
576.5	7,791,184	884,311
574.5	6,230,021	697,331
572.5	4,915,841	617,651
570.5	3,764,791	532,594
568.5	2,790,194	442,150
566.5	2,000,513	350,143
564.5	1,378,650	274,134
562.5	895,076	208,875
560.5	543,017	144,973
558.5	303,524	96,927
556.5	149,657	58,259
554.5	61,667	30,016
552.5	21,969	13,250
550.5	4,521	4,490
548.5	906	714
546.5	106	168
545.5	0	51



Project No: 13-1151-0293
Date: APR.8, 2014
Rev:A
By: TDR

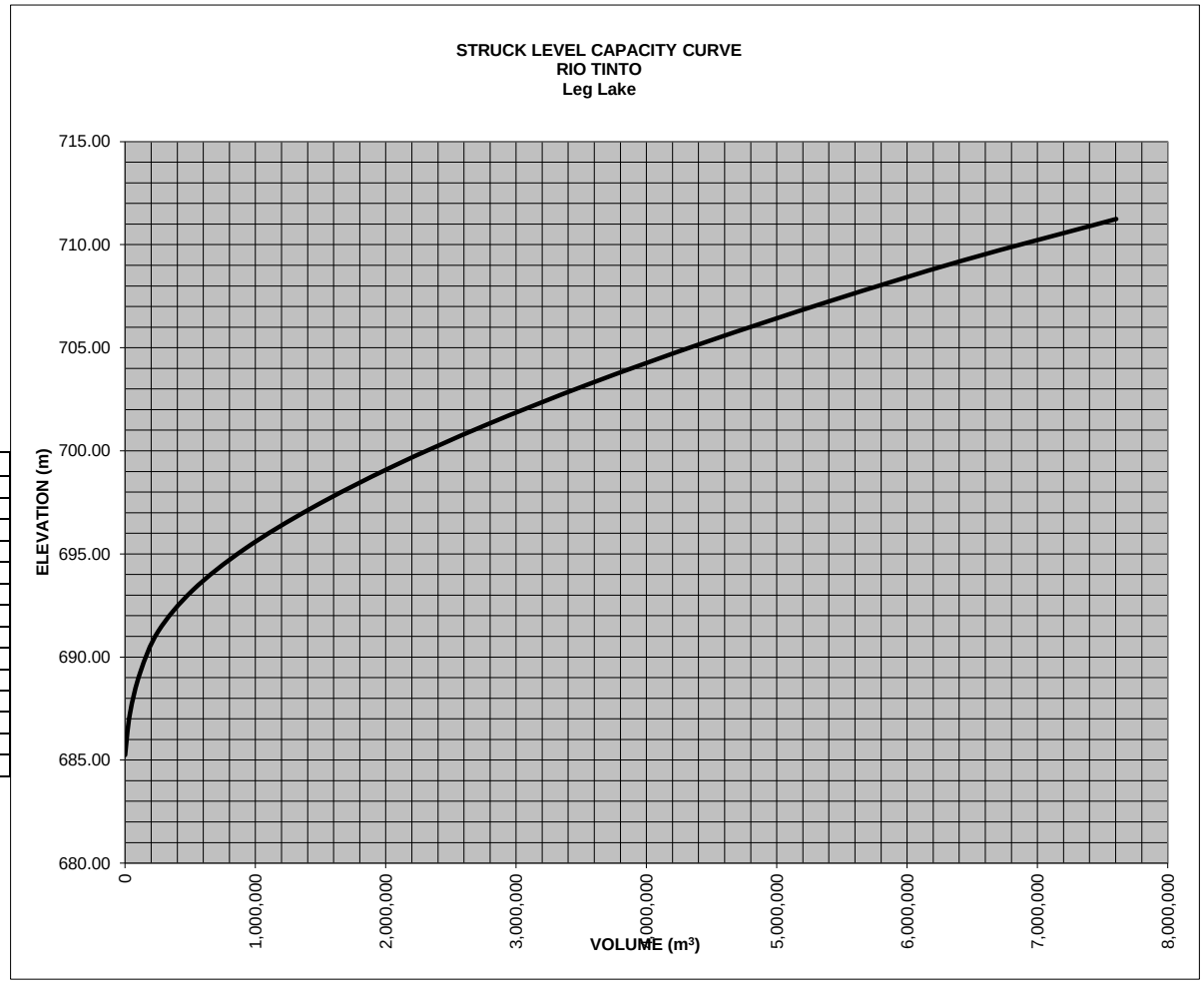
Notes:
1. Bathymetry provided by client. 2m interval

Facility Properties:

Name:	Leg Lake
Area:	635,433.7
Perimeter:	5,519.5
Max. Elev:	711.25
Min. Elev:	685.25
Max. Depth:	26.00

STRUCK LEVEL CAPACITY CURVE
RIO TINTO
Leg Lake

Elev. (m)	Volume (m^3)	Area ($m^{2)}$
711.25	7,604,692	635,434
709.25	6,434,016	537,741
707.25	5,398,770	498,366
705.25	4,440,852	459,932
703.25	3,561,369	419,748
701.25	2,764,430	377,403
699.25	2,054,413	332,947
697.25	1,436,411	285,792
695.25	917,915	232,832
693.25	519,882	168,411
691.25	254,051	103,150
689.25	115,604	51,485
687.25	36,714	29,083
685.25	0	10,714



Project No: 13-1151-0293
Date: APR.8, 2014
Rev:A
By: TDR

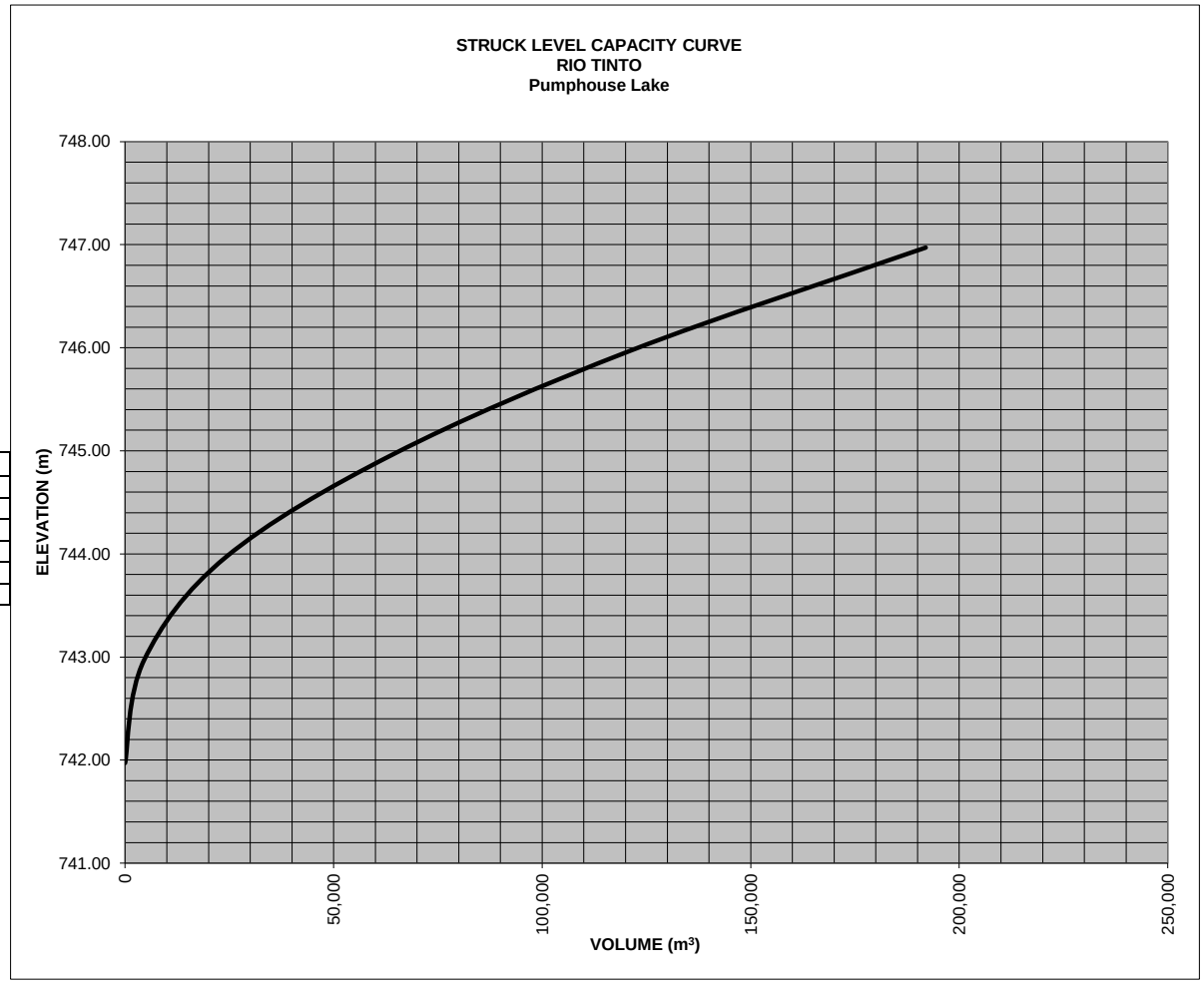
Notes:
1. Bathymetry provided by client. 1m interval

Facility Properties:

Name:	Pumphouse Lake
Area:	78,001.1
Perimeter:	1,724.3
Max. Elev:	746.97
Min. Elev:	-5.0
Max. Depth:	741.97

STRUCK LEVEL CAPACITY CURVE
RIO TINTO
Pumphouse Lake

Elev. (m)	Volume (m^3)	Area ($m^{2)}$
746.97	191,965	78,001.1
745.97	121,186	64,316
744.97	64,516	50,048
743.97	24,242	30,354
742.97	4,571	10,193
741.97	0	1,272



APPENDIX D

2011 Water Quality Tables

Table D.1:
Summary of Groundwater Quality

					Dumbell Lake Watershed									Leg Lake Watershed	
					11/10/2011	11/10/2011	11/10/2011	11/1/2011	10/31/2011	11/1/2011	11/8/2011	11/8/2011	11/8/2011	11/11/2011	11/11/2011
Parameter	**Units**	**RDL**	**CCME [1,2]**	**Metal Mining Effluent Regulations [3]**	W3-11-53(P-03)-DEEP	DUP1-P-03 DEEP	W3-11-53(P-03)-MIDDLE	W-3-11-49 (P-08)-DEEP	W-3-11-49 (P-08))-MIDDLE	W-3-11-49 (P-08)-SHALLOW	W3-11-76(P-16)-DEEP	W3-11-71(P-49)-DEEP	W3-11-71(P-49)-DEEP Lab-Dup	W3-11-40(P-18)-DEEP	W3-11-40(P-18)-DEEP Lab-Dup
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1			65	65	48	96	60	50	60	43	-	135	-
Carb. Alkalinity (calc. as CaCO3)	mg/L	1			ND	ND	ND	ND	ND	ND	ND	ND	-	4	-
Total Alkalinity (Total as CaCO3)	mg/L	5			65	65	48	96	60	50	60	43	-	140	-
Hardness (CaCO3)	mg/L	1			64	65	31	70	32	21	59	41	-	150	-
Calculated TDS	mg/L	1			70	71	54	104	68	61	64	50	-	151	-
Conductivity	uS/cm	1			110	110	84	160	110	92	110	80	-	260	260
Dissolved Chloride (Cl)	mg/L	1	120		ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-
pH	pH	n/a	6.5 to 9.0		7.85	7.84	7.73	7.44	6.99	7.28	8.01	7.79	-	8.46	8.36
Orthophosphate (P)	mg/L	0.01			ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-
Total Organic Carbon (C)	mg/L	0.5			2.8	3.2	5.1	22	55	27	0.7	0.8	-	ND	-
Dissolved Sulphate (SO4)	mg/L	2			ND	ND	ND	ND	ND	2	ND	ND	-	7	-
Turbidity	NTU	0.1			2.6	2.6	13	31	160	74	0.5	4.2	-	81	-
Colour	TCU	5			ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-
Dissolved Fluoride (F-)	mg/L	0.1	0.12		ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-
Total Suspended Solids	mg/L	1		30	4	5	**43**	**80**	**240**	**160**	8	21	-	**260**	-
Bromide (Br-)	mg/L	1			ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-
Nitrate + Nitrite	mg/L	0.05			0.12	0.13	ND	ND	ND	ND	ND	ND	-	ND	-
Nitrite (N)	mg/L	0.01	0.06		ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-
Nitrate (N)	mg/L	0.05	13		0.12	0.13	ND	ND	ND	ND	ND	ND	-	ND	-
Total Ammonia - N	mg/L	0.05			ND	ND	ND	ND	ND	ND	ND	ND	-	ND	ND
Metals [5]															
Dissolved Aluminum (Al)	ug/L	5.0	5 - 100 [6]		8.4	12.1	24.5	13.8	40.1	**223**	12.4	15.8	12.9	**141**	-
Dissolved Antimony (Sb)	ug/L	1.0			1.2	1.5	1.7	2.3	2.2	2.3	ND	ND	ND	ND	-
Dissolved Arsenic (As)	ug/L	1.0	5	1000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Dissolved Barium (Ba)	ug/L	1.0			2.9	2.6	8.6	7	11.4	61.8	72.9	26.8	25.8	34.1	-
Dissolved Beryllium (Be)	ug/L	1.0			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Dissolved Bismuth (Bi)	ug/L	2.0			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Dissolved Boron (B)	ug/L	50	1500		ND	ND	ND	ND	ND	ND	ND	66	ND	ND	-
Dissolved Cadmium (Cd)	ug/L	0.017	90		ND	ND	ND	0.03	0.048	0.047	ND	ND	ND	0.057	-
Dissolved Calcium (Ca)	ug/L	100			15500	15700	7950	16600	8330	5960	12100	11700	11900	25400	-
Dissolved Chromium (Cr)	ug/L	1.0	1 [8]		ND	ND	**1.2**	**1.2**	**3.4**	**1.2**	ND	ND	ND	ND	-
Dissolved Cobalt (Co)	ug/L	0.40			19.3	12	12.5	27.2	34.9	23.9	10.1	6.51	6.22	6.56	-
Dissolved Copper (Cu)	ug/L	2.0	2 - 4 [9]	600	ND	ND	ND	ND	**8.4**	**5.5**	ND	ND	ND	ND	-
Dissolved Iron (Fe)	ug/L	50	300		ND	59	ND	ND	142	**432**	ND	ND	ND	97	-
Dissolved Lead (Pb)	ug/L	0.50	1 - 7 [10]	400	ND	ND	ND	ND	ND	0.81	ND	ND	ND	ND	-
Dissolved Magnesium (Mg)	ug/L	100			6190	6270	2660	6800	2640	1530	7090	2810	2730	21100	-
Dissolved Manganese (Mn)	ug/L	2.0			305	306	824	3850	4040	2110	130	115	112	87.2	-
Dissolved Molybdenum (Mo)	ug/L	2.0	73		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Dissolved Nickel (Ni)	ug/L	2.0	25 - 150 [11]	1000	2.7	ND	3.3	4	7.6	5.5	2.1	ND	ND	ND	-
Dissolved Phosphorus (P)	ug/L	100			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Dissolved Potassium (K)	ug/L	100			784	803	452	1210	913	749	958	762	701	2420	-
Dissolved Selenium (Se)	ug/L	1.0	1		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Dissolved Silver (Ag)	ug/L	0.10	0.1		ND	ND	ND	ND	**0.21**	**0.46**	ND	ND	ND	ND	-
Dissolved Sodium (Na)	ug/L	100			984	1010	7660	11000	11500	14000	1340	1910	1850	2010	-
Dissolved Strontium (Sr)	ug/L	2.0			15.8	15.9	33.4	22.5	15.9	23.2	22.7	21.3	20.4	53.1	-
Dissolved Thallium (Tl)	ug/L	0.10	0.8		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Dissolved Tin (Sn)	ug/L	2.0			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Dissolved Titanium (Ti)	ug/L	2.0			ND	ND	ND	ND	ND	4.1	ND	ND	ND	ND	-
Dissolved Uranium (U)	ug/L	0.10	15		ND	ND	ND	ND	ND	0.16	ND	ND	ND	0.25	-
Dissolved Vanadium (V)	ug/L	2.0			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Dissolved Zinc (Zn)	ug/L	5.0	30	1000	**46.7**	**32.5**	**31.3**	**37**	**36.9**	**63.7**	**34.8**	23.8	21.7	**33.5**	-
Dissolved Mercury (Hg)	ug/L	0.013	0.026		ND	ND	ND	ND	ND	ND	ND	ND	-	ND	-

Notes
1. CCME = Canadian Council Minister's of the Environment Canadian Environmental Quality Guidelines for Aquatic Life Long Term Exposure Limits
2. **Exceeds CCME**
3. Maximum Authorized Concentrations described in Schedule 4 of the Metal Mining Effluent Regulations - Metal Criteria are based on Total and not Dissolved concentrations
4. Exceeds Metal Mining Effluent Regulations
5. All groundwater samples were filtered in the field for metals only; therefore, the concentrations of metals are dissolved (not total).
6. 5 µg/L for pH <6.5, 100 µg/L for pH >6.5
7. The limit for Cadmium is based on hardness. Limits were estimated using the equation: Limit = $10^{0.83*[Log10(hardness)] - 2.46}$ µg/L
8. Limit is 1.0 µg/L for hexavalent chromium and 8.9 µg/L for trivalent chromium. Hexavalent is assumed as a conservative measure
9. The minimum limit for Copper is 2.0 µg/L. The upper limit is based on hardness using the equation: Limit = $e^{0.8545[ln(hardness)] - 1.465}$ * 0.2 µg/L
10. The minimum limit for Lead is 1.0 µg/L. The upper limit is based on hardness using the equation: Limit = $e^{1.273[ln(hardness)]-4.705}$ µg/L
11. The limit for Nickel is based on hardness. Limits were estimated using the equation: Limit = $e^{0.76[ln(hardness)] + 1.06}$ µg/L
TCU = True Colour Unit
ND = Not detected
n/a = not applicable

Table D.2:
Groundwater Quality Results (AMEC, October 2013)

Calculated Parameters	Units	CCME [1,2]	Metal Mining Effluent Regulations [3]	RDL	TW-13-01A	TW-13-01B	TW-13-01C	TW-13-01D	TW-13-01E	TW-13-01F	TW-13-01G	TW-13-01H
Date Sampled					10/11/2013	10/11/2013	10/12/2013	10/13/2013	10/14/2013	10/15/2013	10/16/2013	10/17/2013
Anion Sum	me/L			N/A	0.580	0.570	0.590	0.580	0.560	0.520	0.550	0.550
Bicarb. Alkalinity (calc. as CaCO3)	mg/L			1.0	28	28	29	29	28	25	27	27
Calculated TDS	mg/L			1.0	34	34	35	34	33	30	32	32
Carb. Alkalinity (calc. as CaCO3)	mg/L			1.0	ND	ND	ND	ND	ND	ND	ND	ND
Cation Sum	me/L			N/A	0.600	0.610	0.640	0.600	0.590	0.540	0.560	0.570
Hardness (CaCO3)	mg/L			1.0	27	28	30	28	28	25	26	27
Ion Balance (% Difference)	%			N/A	1.69	3.39	4.07	1.69	2.61	1.89	0.900	1.79
Langelier Index (@20C)	N/A				-1.99	-1.89	-1.85	-1.93	-1.88	-2.06	-1.94	-1.99
Langelier Index (@4C)	N/A				-2.24	-2.15	-2.11	-2.18	-2.14	-2.31	-2.19	-2.25
Nitrate (N)	mg/L	13		0.050	0.098	0.088	0.092	0.095	0.10	0.15	0.11	0.10
Saturation pH (@20)	N/A				9.02	9.02	8.98	9.02	9.04	9.12	9.07	9.06
Saturation pH (@4C)	N/A				9.28	9.28	9.24	9.27	9.30	9.37	9.32	9.32
Inorganics												
Total Alkalinity (Total as CaCO3)	mg/L			5.0	29	28	29	29	28	25	27	27
Dissolved Chloride (Cl)	mg/L	120		1.0	ND	ND	ND	ND	ND	ND	ND	ND
Colour	TCU			5.0	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Fluoride (F-)	mg/L	0.12		0.10	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate + Nitrite	mg/L			0.050	0.098	0.088	0.092	0.095	0.10	0.15	0.11	0.10
Nitrite (N)	mg/L	0.06		0.010	ND	ND	ND	ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L			0.050	0.072	0.10	0.097	ND	0.062	0.11	ND	0.065
Total Organic Carbon (C)	mg/L			0.50	ND	ND	ND	ND	ND	ND	ND	ND
Orthophosphate (P)	mg/L			0.010	ND	ND	ND	ND	ND	ND	ND	ND
pH	-	6.5 to 9.0		N/A	7.03	7.13	7.13	7.09	7.16	7.06	7.13	7.07
Phenols-4AAP	mg/L			0.0010	0.0011	0.0010	ND	ND	0.0021	ND	ND	ND
Reactive Silica (SiO2)	mg/L			0.50	5.6	5.6	5.7	5.6	5.7	5.0	5.6	5.6
Total Suspended Solids	mg/L		30	1.0	1.4	1.8	ND	ND	ND	ND	ND	ND
Dissolved Sulphate (SO4)	mg/L			2.0	ND	ND	ND	ND	ND	ND	ND	ND
Total Kjeldahl Nitrogen	mg/L			0.10	0.10	0.20	0.40	0.34	1.3	0.48	0.12	0.50
Turbidity	NTU			0.10	0.37	0.52	0.14	ND	ND	0.19	ND	0.10
Conductivity	µS/cm			1.0	55	55	55	54	55	53	54	54
Metals												
Total Mercury (Hg)	mg/L	0.000026		0.00013	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Aluminum (Al)	mg/L			0.0050	ND	ND	0.011	ND	ND	ND	ND	ND
Total Aluminum (Al)	mg/L	0.005 - 0.1 [7]		0.0050	0.018	0.0087	0.0061	0.0071	0.013	ND	0.0096	0.0089
Dissolved Antimony (Sb)	mg/L			0.0010	ND	ND	ND	ND	ND	ND	ND	ND
Total Antimony (Sb)	mg/L			0.0010	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Arsenic (As)	mg/L			0.0010	ND	ND	ND	ND	ND	ND	ND	ND
Total Arsenic (As)	mg/L	0.005	1	0.0010	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Barium (Ba)	mg/L			0.0010	ND	0.0013	0.0073	0.0020	0.0049	0.0051	ND	0.0012
Total Barium (Ba)	mg/L			0.0010	0.0019	0.0038	0.0017	0.0027	0.013	0.0021	0.0018	0.0049
Dissolved Beryllium (Be)	mg/L			0.0010	ND	ND	ND	ND	ND	ND	ND	ND
Total Beryllium (Be)	mg/L			0.0010	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Bismuth (Bi)	mg/L			0.0020	ND	ND	ND	ND	ND	ND	ND	ND
Total Bismuth (Bi)	mg/L			0.0020	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Boron (B)	mg/L			0.050	ND	ND	ND	ND	ND	ND	ND	ND
Total Boron (B)	mg/L	1.5		0.050	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Cadmium (Cd)	mg/L			0.000017	ND	ND	ND	ND	ND	0.000017	ND	ND
Total Cadmium (Cd)	mg/L	0.09		0.000017	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Calcium (Ca)	mg/L			0.10	6.5	6.6	7.0	6.6	6.4	5.9	6.2	6.2
Total Calcium (Ca)	mg/L			0.10	6.6	6.5	6.4	6.5	6.4	6.3	6.3	6.7
Dissolved Chromium (Cr)	mg/L			0.0010	ND	ND	0.0012	ND	ND	0.0032	ND	ND
Total Chromium (Cr)	mg/L	0.001 [8]		0.0010	ND	ND	ND	ND	**0.0026**	ND	ND	0.0010
Dissolved Cobalt (Co)	mg/L			0.00040	ND	ND	ND	ND	ND	ND	ND	ND
Total Cobalt (Co)	mg/L			0.00040	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Copper (Cu)	mg/L			0.0020	ND	ND	0.0020	ND	ND	ND	ND	ND
Total Copper (Cu)	mg/L	0.002 - 0.004 [9]	0.6	0.0020	ND	ND	ND	ND	0.0025	ND	ND	ND
Dissolved Iron (Fe)	mg/L			0.050	ND	ND	ND	ND	ND	ND	ND	ND
Total Iron (Fe)	mg/L	0.300		0.050	0.098	ND	ND	ND	0.077	ND	0.062	0.13
Dissolved Lead (Pb)	mg/L			0.00050	ND	ND	0.0024	ND	0.00080	0.00099	ND	ND
Total Lead (Pb)	mg/L	0.001 - 0.007 [10]	0.4	0.00050	ND	0.0010	ND	ND	0.0057	ND	ND	0.0020
Dissolved Magnesium (Mg)	mg/L			0.10	2.7	2.8	2.9	2.8	2.8	2.5	2.6	2.7
Total Magnesium (Mg)	mg/L			0.10	2.6	2.6	2.7	2.7	2.7	2.7	2.8	2.9
Dissolved Manganese (Mn)	mg/L			0.0020	0.0077	0.0074	0.016	0.0031	0.0022	0.0032	ND	ND
Total Manganese (Mn)	mg/L			0.0020	0.044	0.033	0.014	0.0099	0.0085	0.0032	0.0054	0.0088
Dissolved Molybdenum (Mo)	mg/L			0.0020	ND	ND	ND	ND	ND	ND	ND	ND
Total Molybdenum (Mo)	mg/L	0.0730		0.0020	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Nickel (Ni)	mg/L			0.0020	ND	ND	ND	ND	ND	ND	ND	ND
Total Nickel (Ni)	mg/L	0.025 - 0.15 [11]	1	0.0020	ND	ND	ND	ND	ND	ND	0.0027	0.0042
Dissolved Phosphorus (P)	mg/L			0.10	ND	ND	ND	ND	ND	ND	ND	ND
Total Phosphorus (P)	mg/L			0.10	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Potassium (K)	mg/L			0.10	0.69	0.65	0.71	0.62	0.63	0.61	0.64	0.62
Total Potassium (K)	mg/L			0.10	0.75	0.68	0.65	0.67	0.71	0.67	0.63	0.72
Dissolved Selenium (Se)	mg/L			0.0010	ND	ND	ND	ND	ND	ND	ND	ND
Total Selenium (Se)	mg/L	0.001		0.0010	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Silver (Ag)	mg/L			0.00010	ND	ND	ND	ND	ND	ND	ND	ND
Total Silver (Ag)	mg/L	0.0001		0.00010	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Sodium (Na)	mg/L			0.10	0.68	0.59	0.69	0.54	0.54	0.49	0.50	0.49
Total Sodium (Na)	mg/L			0.10	0.62	0.55	0.52	0.51	0.58	0.49	0.50	0.52
Dissolved Strontium (Sr)	mg/L			0.0020	0.0063	0.0060	0.0070	0.0056	0.0057	0.0056	0.0053	0.0059
Total Strontium (Sr)	mg/L			0.0020	0.0068	0.0063	0.0057	0.0061	0.0061	0.0059	0.0060	0.0061
Dissolved Thallium (Tl)	mg/L			0.00010	ND	ND	ND	ND	ND	ND	ND	ND
Total Thallium (Tl)	mg/L	0.0008		0.00010	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Tin (Sn)	mg/L			0.0020	ND	ND	ND	ND	ND	ND	ND	ND
Total Tin (Sn)	mg/L			0.0020	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Titanium (Ti)	mg/L			0.0020	ND	ND	ND	ND	ND	ND	ND	ND
Total Titanium (Ti)	mg/L			0.0020	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Uranium (U)	mg/L			0.00010	ND	ND	ND	ND	ND	ND	ND	ND
Total Uranium (U)	mg/L	0.015		0.00010	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Vanadium (V)	mg/L			0.0020	ND	ND	ND	ND	ND	ND	ND	ND
Total Vanadium (V)	mg/L			0.0020	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Zinc (Zn)	mg/L			0.0050	ND	ND	0.027	ND	ND	0.026	ND	ND
Total Zinc (Zn)	mg/L	0.030	1	0.0050	0.0057	ND	ND	ND	0.018	ND	ND	0.0053

Notes:
1. CCME = Canadian Council Minister's of the Environment Canadian Environmental Quality Guidelines for Aquatic Life Long Term Exposure Limits
2. **Exceeds CCME**
3. Maximum Authorized Concentrations described in Schedule 4 of the Metal Mining Effluent Regulations - Metal Criteria are based on Total concentrations
4. Exceeds Metal Mining Effluent Regulations
5: NR - None Required
6: ND - None Detected
7. 5 µg/L for pH <6.5, 100 µg/L for pH >6.5
8. Limit is 1.0 µg/L for hexavalent chromium and 8.9 µg/L for trivalent chromium. Hexavalent is assumed as a conservative measure
9. The minimum limit for Copper is 2.0 µg/L. The upper limit is based on hardness using the equation: Limit = $e^{0.8545[\ln(\text{hardness})] - 1.465}$ * 0.2 µg/L
10. The minimum limit for Lead is 1.0 µg/L. The upper limit is based on hardness using the equation: Limit = $e^{1.273[\ln(\text{hardness})]-4.705}$ µg/L
11. The limit for Nickel is based on hardness. Limits were estimated using the equation: Limit = $e^{0.76[\ln(\text{hardness})] + 1.06}$ µg/L

Table D.3:
Summary of Surface Water Quality

Parameter	Units	RDL	CCME [1,2]	SW2	SW4	SW6	SW7	SW8	SW9	SW10	Dup (SW6)
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1		38	109	98	41	33	43	30	89
Carb. Alkalinity (calc. as CaCO3)	mg/L	1		<1	2	2	<1	<1	<1	<1	1
Total Alkalinity (Total as CaCO3)	mg/L	5		38	110	100	41	33	44	30	90
Hardness (CaCO3)	mg/L	1		34	170	140	39	33	41	29	140
Calculated TDS	mg/L	1		41	238	189	42	38	46	33	181
Conductivity	uS/cm	1		71	430	330	78	65	82	61	330
Dissolved Chloride (Cl)	mg/L	1	120	<1	33	23	<1	<1	<1	<1	23
pH	pH		6.5 to 9.0	7.87	8.35	8.24	7.84	7.75	7.92	7.71	8.23
Orthophosphate (P)	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Organic Carbon (C)	mg/L	0.5		<0.5	1.1	1.4	3.4	2.3	1	1.9	1.7
Dissolved Sulphate (SO4)	mg/L	2		<2	14	11	<2	2	<2	<2	11
Turbidity	NTU	0.1		<0.1	0.3	0.3	0.3	0.3	0.2	0.9	0.3
Colour	TCU	5		<5	<5	6	18	12	5	12	5
Dissolved Fluoride (F-)	mg/L	0.1	0.12	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Suspended Solids	mg/L	1		<2	1	1	8	1	1	4	2
Bromide (Br-)	mg/L	1		<1	<1	<1	<1	<1	<1	<1	<1
Nitrate + Nitrite	mg/L	0.05		0.14	11	7.6	<0.05	<0.05	0.11	<0.05	7.5
Nitrite (N)	mg/L	0.01	0.06	<0.01	**0.12**	**0.08**	<0.01	<0.01	<0.01	<0.01	**0.08**
Nitrate (N)	mg/L	0.05	13	0.14	11	7.5	<0.05	<0.05	0.11	<0.05	7.4
Total Ammonia - N	mg/L	0.05	table	<0.05	0.43	0.22	<0.05	<0.05	<0.05	<0.05	0.19
Unionized Ammonia	mg/L	n/a		0.000	0.017	0.007	0.000	0.000	0.000	0.000	0.006
Metals											
Total Aluminum (Al)	ug/L	5.0	5 - 100 [3]	14.7	26.3	22.3	**107**	26.9	18.5	77.8	20.1
Dissolved Aluminum (Al)	ug/L	5.0		6.5	<5.0	<5.0	18.9	15.1	5.3	9.7	6.6
Total Antimony (Sb)	ug/L	1.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Arsenic (As)	ug/L	1.0	5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Barium (Ba)	ug/L	1.0		2.5	7.3	8.0	9.2	7.3	5.2	7.1	8.2
Total Beryllium (Be)	ug/L	1.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Bismuth (Bi)	ug/L	2.0		<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total Boron (B)	ug/L	50	1500	<50	<50	<50	<50	<50	<50	<50	<50
Total Cadmium (Cd)	ug/L	0.017	0.04 - 0.37 [4]	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Total Calcium (Ca)	ug/L	100		8040	33400	26800	10200	8220	10300	7270	26500
Total Chromium (Cr)	ug/L	1.0	1 [5]	<1.0	<1.0	<1.0	**6.6**	<1.0	**1.7**	<1.0	<1.0
Total Cobalt (Co)	ug/L	0.40		<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Total Copper (Cu)	ug/L	2.0	2 - 4 [6]	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total Iron (Fe)	ug/L	50	300	<50	141	112	**322**	<50	<50	192	100
Total Lead (Pb)	ug/L	0.50	1 - 7 [7]	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.70	<0.50
Total Magnesium (Mg)	ug/L	100		3610	23300	18000	4000	3020	3790	2820	17200
Total Manganese (Mn)	ug/L	2.0		<2.0	27.8	33.5	91.1	3.8	4.2	22.4	31.4
Total Molybdenum (Mo)	ug/L	2.0	73	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total Nickel (Ni)	ug/L	2.0	25 - 150 [8]	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total Phosphorus (P)	ug/L	100		<100	<100	<100	<100	<100	<100	<100	<100
Total Potassium (K)	ug/L	100		617	2360	2070	638	741	759	793	1960
Total Selenium (Se)	ug/L	1.0	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Silver (Ag)	ug/L	0.10	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total Sodium (Na)	ug/L	100		452	15400	11100	472	517	447	767	10700
Total Strontium (Sr)	ug/L	2.0		9.4	33.5	28.5	9.1	9.7	10.5	10.0	27.4
Total Thallium (Tl)	ug/L	0.10	0.8	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total Tin (Sn)	ug/L	2.0		<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total Titanium (Ti)	ug/L	2.0		<2.0	2.3	<2.0	3.9	<2.0	<2.0	4.3	2.1
Total Uranium (U)	ug/L	0.10	15	<0.10	0.31	0.24	<0.10	<0.10	<0.10	<0.10	0.22
Total Vanadium (V)	ug/L	2.0		<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total Zinc (Zn)	ug/L	5.0	30.0	<5.0	<5.0	<5.0	10.0	<5.0	<5.0	8.1	<5.0
Total Mercury (Hg)	ug/L	0.013	0.026	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013

Notes

1. CCME = Canadian Council Minister's of the Environment Canadian Environmental Quality Guidelines for Aquatic Life Long Term Exposure Limits
2. **Exceeds CCME**
3. 5 µg/L for pH <6.5, 100 µg/L for pH >6.5
4. The limit for Cadmium is based on hardness. Limits were estimated using the equation: Limit = $10^{0.83*[Log10(hardness)] - 2.46}$ µg/L
5. Limit is 1.0 µg/L for hexavalent chromium and 8.9 µg/L for trivalent chromium. Hexavalent is assumed as a conservative measure
6. The minimum limit for Copper is 2.0 µg/L. The upper limit is based on hardness using the equation: Limit = $e^{0.8545[ln(hardness)] - 1.465} * 0.2$ µg/L
7. The minimum limit for Lead is 1.0 µg/L. The upper limit is based on hardness using the equation: Limit = $e^{1.273[ln(hardness)]-4.705}$ µg/L
8. The limit for Nickel is based on hardness. Limits were estimated using the equation: Limit = $e^{0.76[ln(hardness)] + 1.06}$ µg/L

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