

# **Appendix I**

## **Crawford Site-Wide Water Balance Summary Report**

# Crawford – Site-Wide Water Balance Summary Report

Revision C

**Prepared for:**

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## 1.0 Introduction

The Crawford Nickel Sulphide Project (the Project) is a planned open pit nickel mine development owned by Canada Nickel Company (CNC). The project is located approximately 42 kilometres (km) north of Timmins, in northern Ontario. The project will involve the development of an Open Pit mining area, a Process Plant, as well as Impoundment, Stockpiles, and Tailings Management Facilities. Ausenco was retained by CNC to develop an overall water management strategy for the site and develop an accompanying Water Balance to support infrastructure planning and permitting. This document summarizes the water balance model.

## 2.0 Water Balance Objectives

The site-wide water balance provides an understanding of the spatial and temporal movement of water around the site and aids in the sizing of water storage infrastructure and conveyance mechanism. The principal objectives of the water balance are:

- Sourcing the required make-up water volume for operational activities.
- Optimizing the utilization of reclaimed water to minimize dependence on external make-up water sources.
- Assessing on-site hydrological conditions, considering potential impacts of climate change.
- Determining treatment rates to maintain water quantity standards and regulate discharge into the receiving environment.
- Evaluating the capacity of water storage facilities to ensure effective management of water resources and storm runoff resulting from extreme precipitation events.
- Estimating flow variations throughout various phases of the mine's lifecycle.

The water balance model was developed using GoldSim (GoldSim Technology Group LLC, 2022) to simulate changes to water flow during the life of mining operations and into closure.

A monthly water balance was developed to simulate the construction, operation, closure, and post closure phases of the project.

Select years were further refined to a daily timestep to provide better resolution of water movement during key years.

### 3.0 Water Balance Model Input and Assumptions

Model inputs and assumptions are detailed in the following sections. Additional project parameters can be found in the Water Management Plan and Design Criteria prepared by Ausenco. The following water components were considered in the water balance:

- Surface runoff from disturbed areas (Impoundment Facility, Tailings Management Facility (TMF), East and West Stockpiles, Process Plant)
- Precipitation and groundwater inflows for Main Zone and East Zone Pits as well as Collection Ponds.
- Direct precipitation and evaporation from Collection Ponds
- Process water requirement.

The overall project development schedule is composed of several key phases, each encompassing various project activities. A summary of the general assumptions is presented in **Figure 3-1** below. Additional information on sequencing is provided in the Water Management Plan (Ausenco, 2024).

## Mine Sequencing

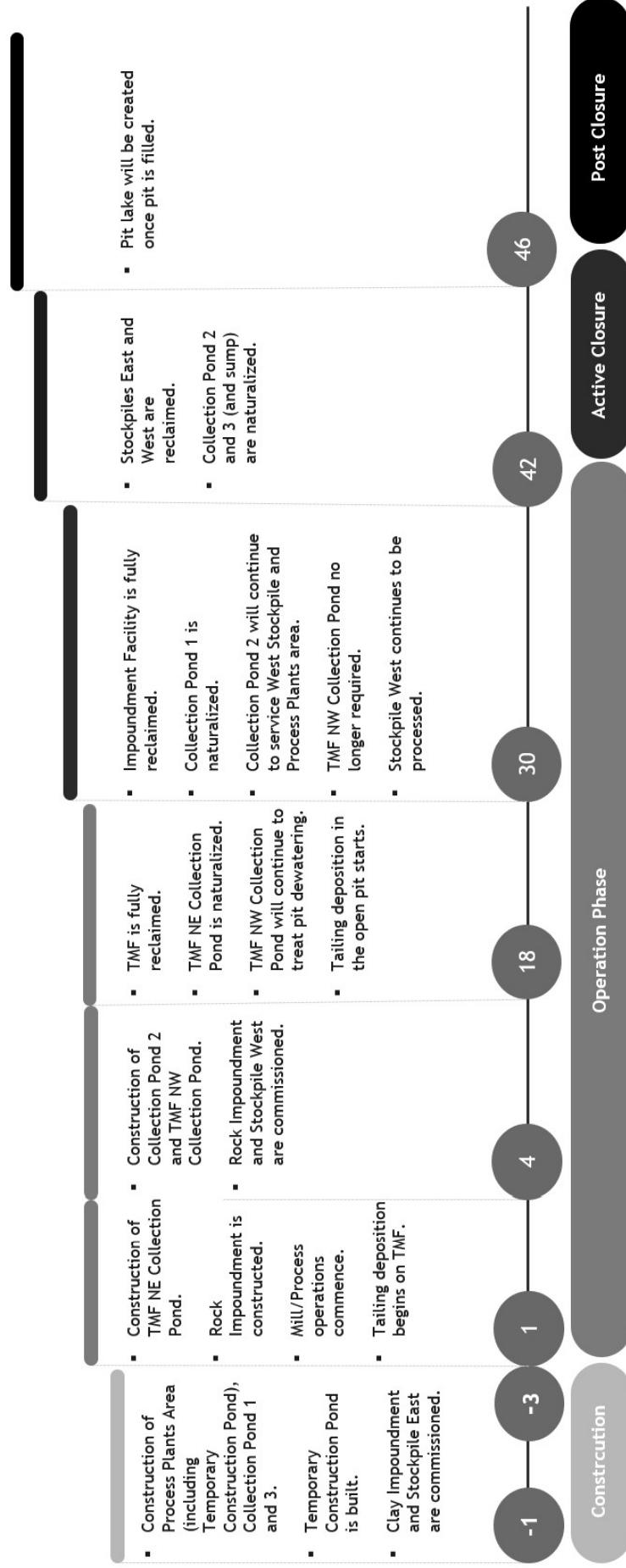


Figure 3-1 Mine Sequencing and Key Phases Assumption Overview

The footprints for each stage of the mine, along with their changes over time, are summarized in **Appendix B**.

### 3.1 Climate Inputs

The water balance was developed using the climate parameters provided by Stantec (Stantec, 2024), shown in **Table 3-1**. Snowmelt was estimated based on the temperature increase in late spring and summer from April to June. The daily climate adjusted inputs, provided by Stantec, are included in **Appendix A**. The meteorological data also included climate adjusted precipitation for the 1/100-year, 24-hour and 1/10-year, 24-hour design storms (**Table 3-2**).

**Table 3-1 Climate Adjusted Meteorological Data**

2071-2100 Climate Normal			
Month	Total Rainfall (mm)	Total Snowfall (mm water equivalent)	Temperature (°C)
January	2.24	67.48	-10.84
February	3.68	49.13	-9.8
March	18.59	45.18	-4.05
April	46.96	13.74	5.49
May	73.67	1.68	12.89
June	82.98	0.02	18.65
July	85.44	0.00	21.44
August	81.66	0.00	20.21
September	93.67	0.13	15.16
October	76.71	7.19	8.45
November	43.69	41.94	0.76
December	9.83	64.82	-6.9

Source: Stantec, 2024

**Table 3-2 Climate Adjusted Design Storms**

Duration	Total Rainfall (mm)	
	10-year	100-year
24 hour	98.40	151.20

Source: Stantec, 2024

### 3.2 Footprint Areas

The facility footprint areas are outlined in **Table 3-3**. As noted in the Water Management Plan, a conservative assumption was made that the mine footprint would be effectively constructed by the fourth year of operations. Reclamation of various facility infrastructure is further described in the Water Management Plan.

**Table 3-3 Footprint Areas**

Mine Life	Construction (Year -1)	Operations (Year 2)	Operations (Year 4)
	(m <sup>2</sup> )	(m <sup>2</sup> )	(m <sup>2</sup> )
Clay Impoundment – Natural Ground	2,830,009	2,830,009	2,830,009
Clay Impoundment	15,164,377	19,678,862	20,176,498
Rock Impoundment – Natural Ground	-	-	208,684
Rock Impoundment	-	-	11,718,271
East Stockpile North – Natural Ground	60,000	60,000	60,000
East Stockpile North	2,415,169	2,415,169	2,415,169
East Stockpile South – Natural Ground	168,000	168,000	168,000
East Stockpile South	695,094	695,094	695,094
West Stockpile – Natural Ground	-	-	715,228
West Stockpile	-	-	5,210,000
Process Plants	926,125	926,125	926,125
TMF	1,899,858	5,225,796	17,161,837
MZ Pit	-	-	4,419,200
MZ Pit	1,002,102	2,422,613	4,419,200

### 3.3 Runoff

The runoff coefficient is an important parameter used in the water balance modelling to quantify the proportion of rainfall that contributes to surface runoff. It represents the fraction of total precipitation that becomes runoff after accounting for factors such as soil type, land cover, and terrain characteristics. Different runoff coefficients are utilized across various land surfaces within the model, reflecting the diverse hydrological conditions present in different areas of the mine site (**Table 3-4**). These coefficients are determined based on factors such as soil texture, vegetation cover, and land use practices, and are essential for accurately simulating the movement of water through the landscape and estimating the overall water balance of the system.

During the construction and operational phases, runoff coefficients reflect the characteristics of disturbed areas where soil compaction and limited vegetation cover increase surface runoff. The runoff coefficient adopted for the for Stockpiles and Rock Impoundment was based on the coarse rock material that will comprise those locations. Considering the composition of the Clay Impoundment, which consists of roughly 37% sand and till, 40% clay, and 20% mixed material (clay and rock) storage, a weighted composite runoff coefficient was used.

**Table 3-4 Runoff Coefficients for Various Mine Site Areas**

Land Use Type	Runoff Coefficient		
	Construction Phase	Operations Phase	Closure Phase
Natural Ground	0.5	0.5	0.5
Tailings Management Facility	0.7	0.7	0.7
Pits	1	1	1
Ponds	1	1	1
East and West Stockpile	0.4	0.4	0.7
Rock Impoundment	0.4	0.4	0.7
Clay Impoundment	0.51	0.51	0.7
Reclaimed Areas	0.7	0.7	0.7
Process Plants	0.8	0.8	0.7

### 3.4 Pit Inflows

Inflow into the pits includes groundwater, direct precipitation, and surface runoff from nearby areas. Once collected, a portion of this water will be transported to the TMF Collection Ponds for treatment, depending on each pond’s capacity and treatment availability. To manage any excess flow, a sump will be installed within the pits with an estimated capacity of 400,000 m<sup>3</sup>, which will be used to store and regulate make-up water as well as managing design storms.

A groundwater model was developed by Stantec for the various phases of the mine to assess potential hydrogeological impacts throughout the mine’s stages. **Table 3-5** outlines the groundwater inflows used for the water balance. As part of the hydrogeological assessment, Stantec also developed groundwater stage-inflows for post-mining conditions to assess the infiltration into the pit and the long-term steady-state groundwater inflows once the pit was completely infilled. These are shown in the table below.

**Table 3-5 Groundwater Pit Inflow**

Stages of Mine (Year)	Average GW inflow (m <sup>3</sup> /d)
Years -1	2,700
Year 15	10,500
Year 31	9,400
Post Closure - East Spillway	900
Post Closure - West Spillway	500

**Table 3-6 Post mining Pit inflows**

Stages of Mine (m above sea level)	Average GW inflow (m <sup>3</sup> /d)
-255	9,400
-245	9,400
-14	8,600
86	8,000
136	7,900
186	7,400
236	5,900
268 (closure spillway elevation)	1,400 (to Spillways)

### 3.5 Process and Fresh water Requirements

The determination of water requirements at the mill was based on the specified mill production and tailings characteristics. **Table 3-7** provides the summary of the required process makeup water. It should be noted that reclaimed slurry water within the tailings (bleed water) is not included within the water balance. This water is considered within the process mass balance and is assumed to be reclaimed. The difference between the reclaimable tailings water and the process plants' requirements is the noted required process makeup water.

**Table 3-7 Process and Fresh Water Model Input**

Parameters	Phase 1	Phase 2	Units
Required Process Makeup	532	1,062	m <sup>3</sup> /hr

The primary source of process makeup water will be through pit dewatering and from precipitation runoff from the TMF.

### 3.6 Pit Lake

Following the completion of mining in year 30, the open pit begins to fill with water. By the end of year 159, the pit lake is expected to reach its target elevation of approximately 268 metres. Once this elevation is achieved, any excess water will be managed through a spillway system, diverting the surplus overflow to the North Driftwood and West Buskegau catchments. Based on the pre-mining catchments, approximately 63% of the pit's catchment reports to the North Driftwood River with the remaining water going to the West Buskegau.

## 4.0 Water Balance Modelling Methodology

The WB model was developed using GoldSim software (GoldSim, 2024) with a daily time-step interval, incorporating monthly and daily climate data for average conditions over the anticipated life of mine.

The water management plan developed for the project was used to define strategies in the Crawford Water Balance Model. Detailed information on the overall Crawford water management approach is outlined in the Water Management Plan. The groundwater inflows developed by Stantec for the project were also integrated into the GoldSim water balance..

### 4.1 Construction, Operation and Closure

Runoff and shallow seepage from contact areas will be collected and directed to a series of Collection Ponds for treatment before being released to the environment receivers. Further details on the water management strategy can be found in the Water Management Plan. A treatment rate of 28,000 m<sup>3</sup>/day has been used as the maximum treatment rate for the collected contact runoff. Pond storage is utilized to store and attenuate higher inflows. For detailed inflow and outflow data for the ponds, please refer to **Table 4-1**.

**Table 4-1 Operation and Closure Considerations and the impact on the WBM**

Water Management Facilities	Operation		Outflows	Year	Closure Impact on the WBM
	Year	Inflows			
Temporary Construction Pond	-1 to 4	<ul style="list-style-type: none"> <li>Precipitation on Pond</li> <li>Runoff from the Process Plants</li> <li>Receiving the water from the Pits</li> </ul>	<ul style="list-style-type: none"> <li>Treated Water will be released to the receiving environment or will be reclaimed for process plant</li> </ul>	4	<ul style="list-style-type: none"> <li>Removing Pond from WBM,</li> <li>Directing the runoff from the Process Plants to Collection Pond 2</li> <li>Pit dewatering will be treated at TMF Collection Ponds</li> </ul>
Collection Pond 1	-3 to 30	<ul style="list-style-type: none"> <li>Precipitation on Pond</li> <li>Runoff from the Clay Impoundment</li> <li>Runoff from the Collection Pond 1 catchment</li> </ul>	<ul style="list-style-type: none"> <li>Evaporation from Collection Pond 1</li> <li>Treated water</li> <li>Dust suppression supplied by Collection Pond 1</li> </ul>	30	<ul style="list-style-type: none"> <li>Collection Pond 1 will become a natural lake landform and will no longer be required for storage or treatment.</li> <li>Collection Pond 1 outflow will no longer supply water for dust suppression, resulting in its elimination.</li> </ul>
Collection Pond 2	4 to 42	<ul style="list-style-type: none"> <li>Precipitation on Pond</li> <li>Runoff from Rock Impoundment</li> <li>Runoff from Collection Pond 2 catchment</li> <li>Runoff from West Stockpile</li> <li>Runoff from Process Plants</li> </ul>	<ul style="list-style-type: none"> <li>Evaporation from Collection Pond 2</li> <li>Treated water</li> <li>Dust suppression supplied by Collection Pond 2</li> </ul>	42	<ul style="list-style-type: none"> <li>Runoff from reclaimed portion of the Rock Impoundment will be redirected to West Buskegau River</li> <li>Collection Pond 2 will transition into a natural lake and will no longer be used for treatment or storage purposes.</li> </ul>
Collection Pond 3	-3 to 42	<ul style="list-style-type: none"> <li>Precipitation on Pond</li> <li>Runoff from the East Stockpile - North</li> <li>Runoff from Collection Pond 3 catchment</li> </ul>	<ul style="list-style-type: none"> <li>Evaporation from Collection Pond 3</li> <li>Treated water</li> </ul>	42	<ul style="list-style-type: none"> <li>Runoff from the reclaimed portion of East Stockpile - North will now be released to the west Buskegau River.</li> <li>Collection Pond 3 will be converted into a natural lake landform and will no longer be needed for treatment or storage.</li> </ul>
NE Collection Pond	1 - 18	<ul style="list-style-type: none"> <li>Precipitation on Pond</li> <li>Runoff from the TMF</li> <li>Portion of the Dewatering that will be treated in NE Collection Pond</li> </ul>	<ul style="list-style-type: none"> <li>Evaporation from NE Collection Pond</li> <li>Treated water.</li> <li>Demand Process Water supplied by NE Collection Pond</li> </ul>	18	<ul style="list-style-type: none"> <li>NE Collection Pond naturalized and removed from water balance.</li> <li>Runoff from the east side of TMF will now be directed to West Buskegau River.</li> <li>Pit dewatering will only be treated at NW Collection Pond</li> </ul>
NW Collection Pond	4 to 30	<ul style="list-style-type: none"> <li>Precipitation on Pond</li> <li>Runoff from TMF</li> <li>Portion of the Dewatering that will be treated</li> </ul>	<ul style="list-style-type: none"> <li>Evaporation from NW Collection Pond</li> <li>Treated water</li> <li>Demand Process Water supplied by NW Collection Pond</li> </ul>	30	<ul style="list-style-type: none"> <li>Pit dewatering will no longer be directed to the TMF Collection Ponds, as they have been eliminated.</li> <li>Naturalized ponds will serve as an additional source to cover the makeup water demand in cases where pit dewatering proves insufficient.</li> <li>Runoff from the previous Pond Catchment will be redirected to North Driftwood receiver.</li> </ul>

## 4.2 Monthly Climate-Adjusted Water Balance Model

The purpose of the monthly model was to simulate the flows and make-up water requirements throughout the entire Life of Mine, using monthly time steps under average climate conditions. On average, the site receives 620 mm rainfall and 290 mm snowfall (water equivalent) per year. The water balance incorporates monthly climate normal inputs including rainfall, snowfall, temperature, and evaporation, spanning from year -3 to 159, when the pit lake is filled. It simulates mine site flows in one continuous model throughout the life of mine and uses a monthly time step. Visual representation of the monthly water balance flows within the mine site is provided in **Figure 4-1**. Details of water balance inputs and assumptions are presented in **Section 2.0**, with results of the model summarized in **Section 5.0**.

## 4.3 Daily Climate-Adjusted Water Balance Model for Specific years

Water balance simulations were conducted using daily timesteps and incorporating daily climate-adjusted data provided by Stantec. By simulating these key years with daily timesteps, seasonal variations and long-term trends in water availability and usage within the mine site were captured. The following significant years were assessed as part of the daily simulations:

- Construction Phase Year -1
- Operations Phase Year 2
- Operation Phase Year 4; representing full mine footprint
- Operations Phase Year 23; representing TMF closure and reclamation
- Operations Phase Year 35; representing Impoundment Facility closure and reclamation
- Operations Phase Year 41; end of mining
- Closure Phase Year 47; representing reclamation of Stockpiles
- Post-Closure Year 60
- Post-Closure Year 159; pit lake established.

**Figure 4-1** to **Figure 4-6** visually represent the water flows during these key years.

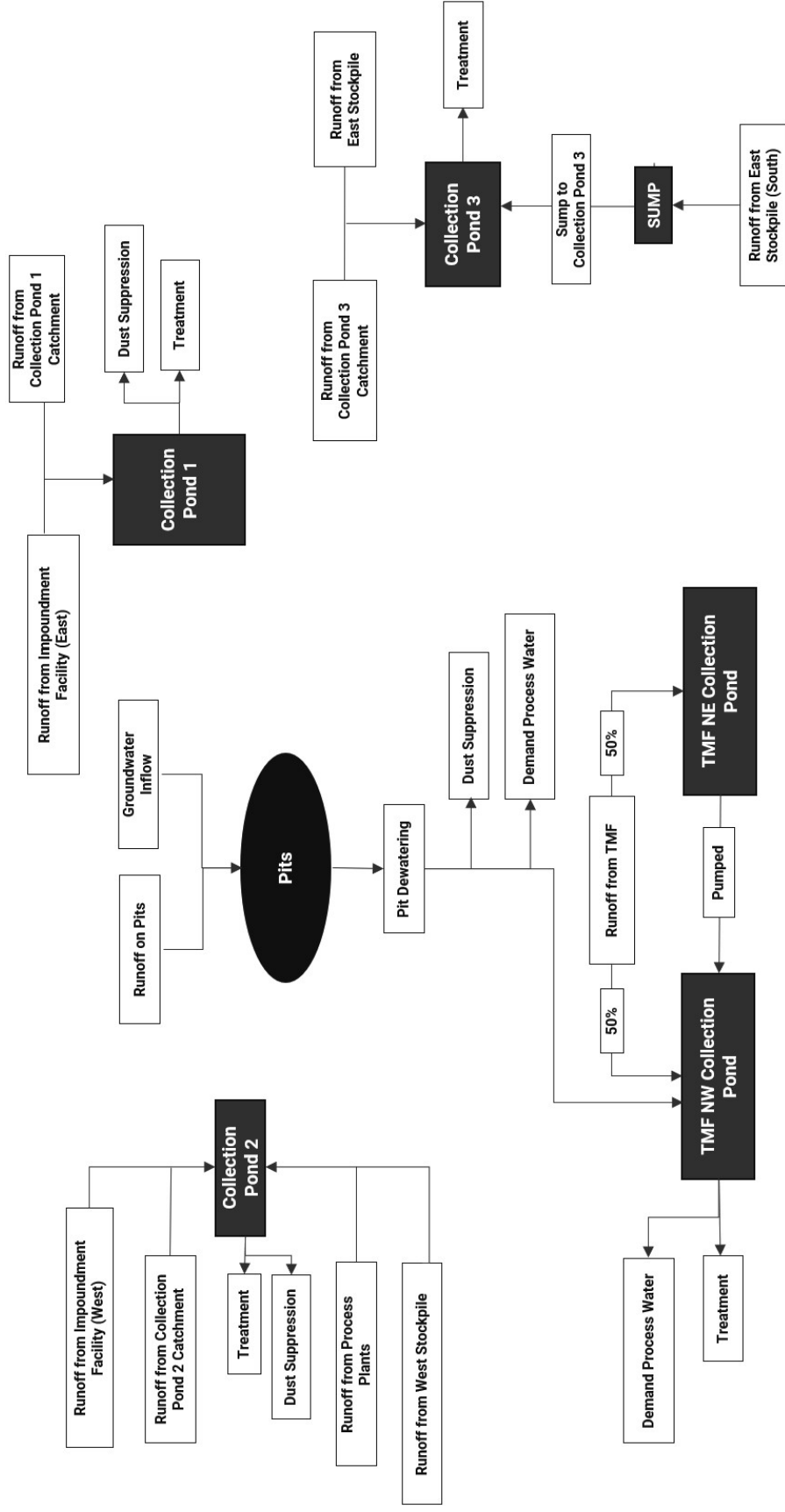


Figure 4-1 Water Balance Schematic

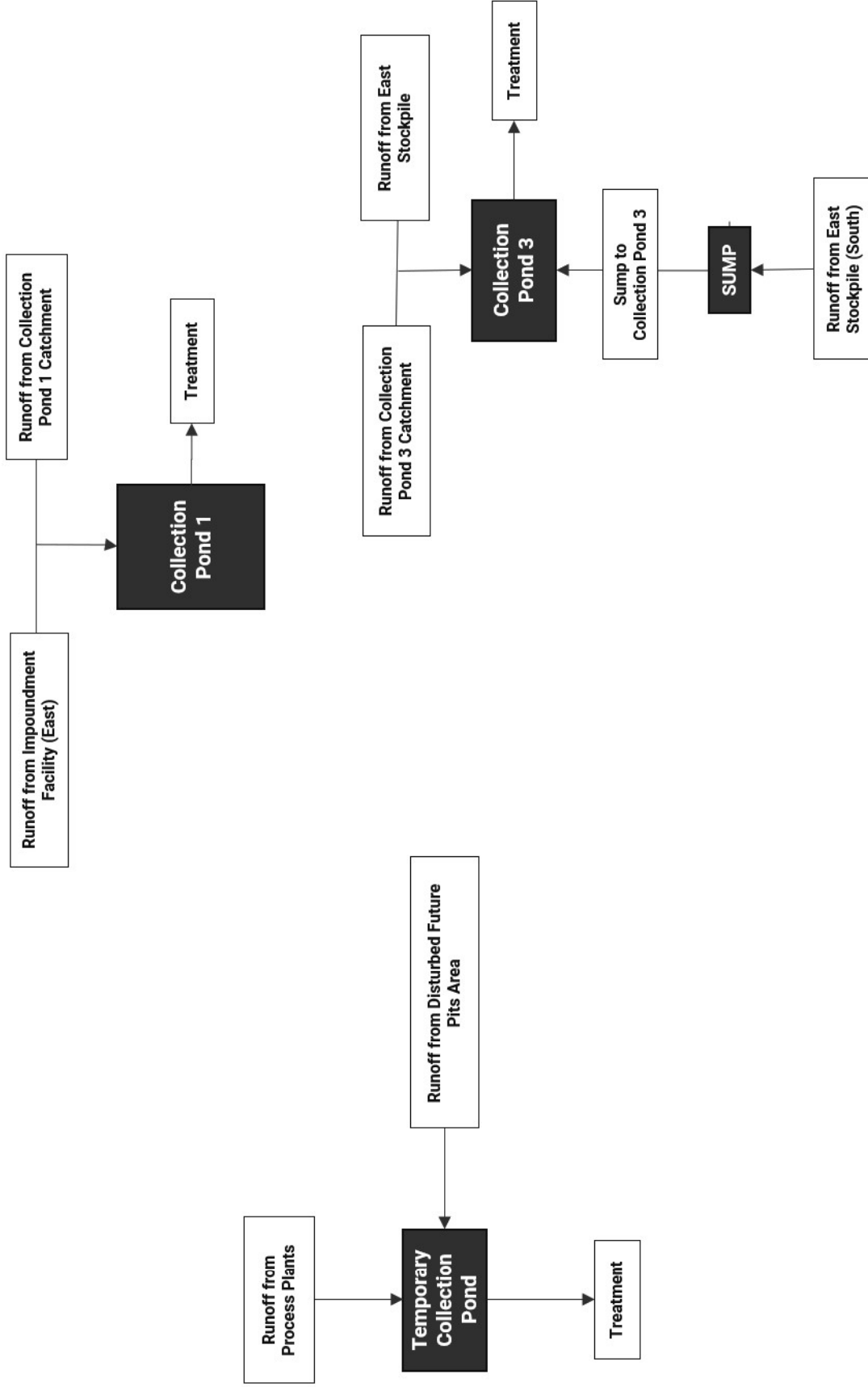


Figure 4-2 Water Balance Schematic Year -1 (Construction)

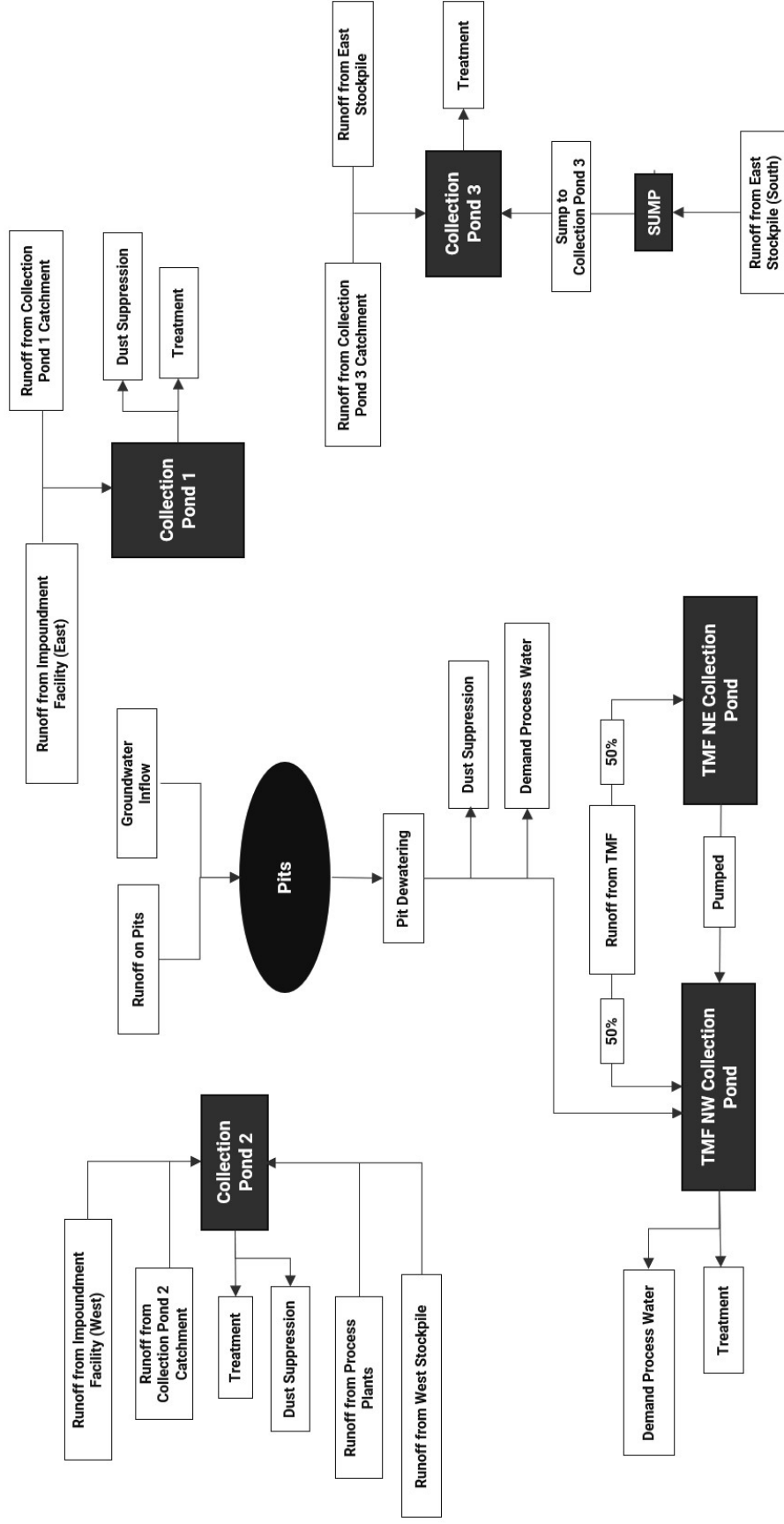


Figure 4-3 Water Balance Schematic - Year 4 (Operation)

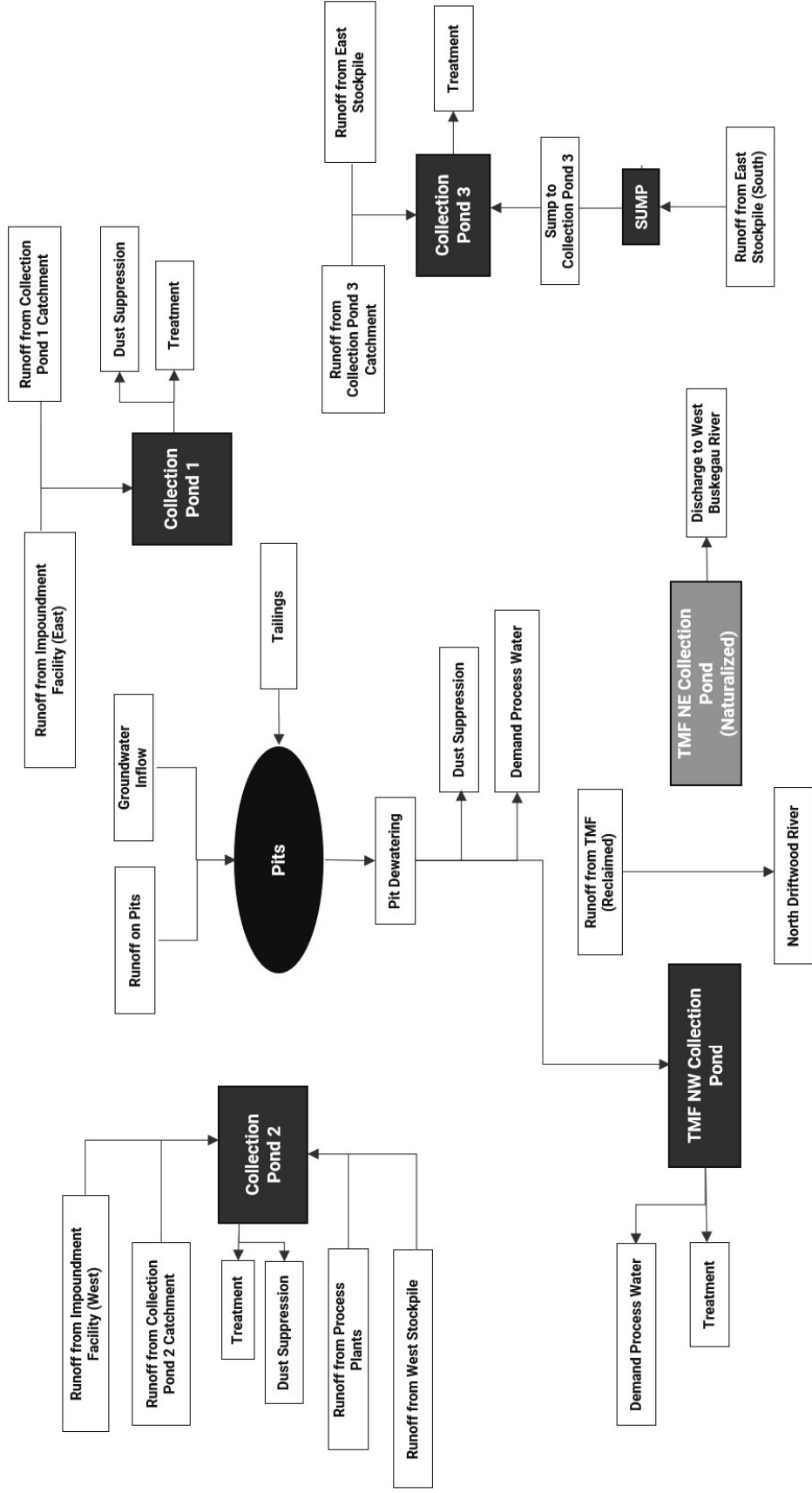


Figure 4-4 Water Balance Schematic - Year 23 (Operation; TMF Reclaimed)

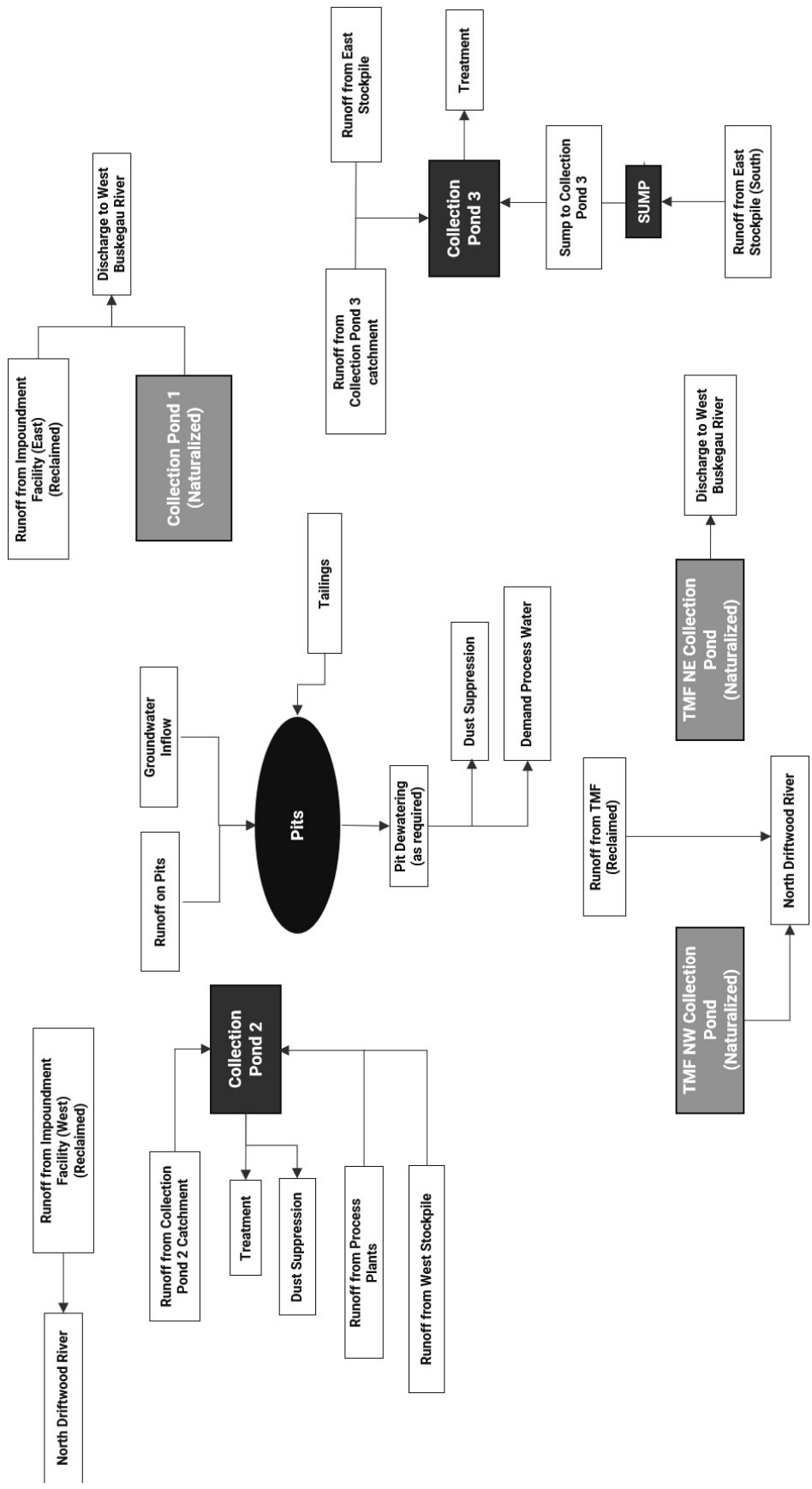


Figure 4-5 Water Balance Schematic - Year 35 (Operation; Impoundment Facility Reclaimed)

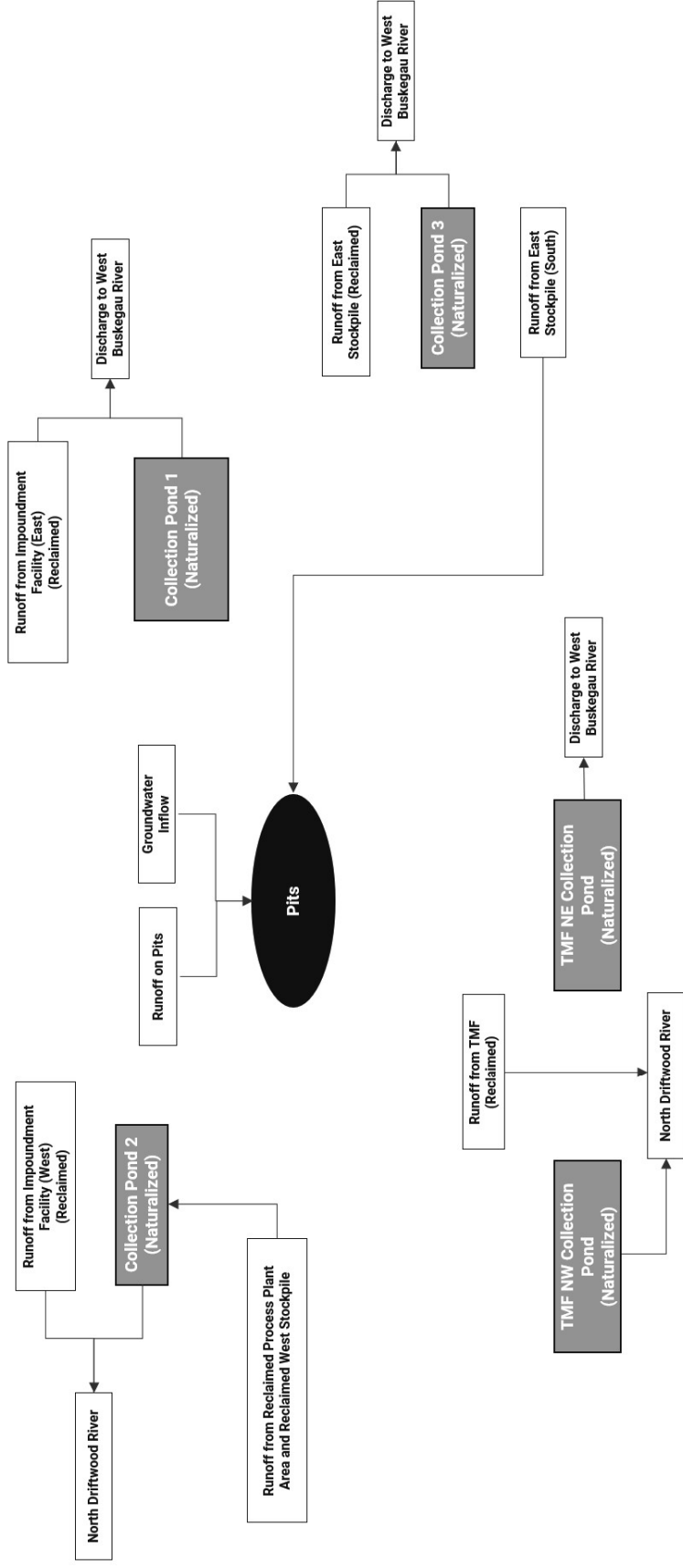


Figure 4-6 Water Balance Schematic - Year 47 (Closure)

## 5.0 Results

The following section discusses the water balance modeling results under climate normal conditions, with a focus on both monthly and daily data for each mine facility.

### 5.1 Monthly Simulation

The water balance results are outlined in the following sections. Average monthly inflows and outflows during the construction, operation, and closure phases are summarized in **Table 5-1** covering the major mine facilities including TMF, Main Zone and East Zone Pits, Stockpiles, Impoundment Facility and Collection Ponds. Peak inflows are shown in **Table 5-1**. The detailed results from the monthly model are presented in **Appendix C** for further reference.

**Table 5-1 Summary Result of Monthly WBM Simulation (Average Inflows)**

Storage Facility	Flows				
	Collection Pond 1	Collection Pond 2	Collection Pond 3	NE Collection Pond	NW Collection Pond
	(m <sup>3</sup> /month)	(m <sup>3</sup> /month)	(m <sup>3</sup> /month)	(m <sup>3</sup> /month)	(m <sup>3</sup> /month)
<b>Average Inflows</b>	890,403	441,341	95,962	543,554	402,030
<b>Average Outflows</b>	868,713	455,844	95,962	583,807	422,437

**Table 5-2 Summary Result of Monthly WBM Simulation (Peak Inflows)**

Storage Facility	Flows				
	Collection Pond 1	Collection Pond 2	Collection Pond 3	NE Collection Pond	NW Collection Pond
	(m <sup>3</sup> /month)	(m <sup>3</sup> /month)	(m <sup>3</sup> /month)	(m <sup>3</sup> /month)	(m <sup>3</sup> /month)
<b>Peak Inflows</b>					
Direct Precipitation	81,577	85,786	9,530	73,005	92,982
Runoff	2,186,242	1,578,002	228,844	1,247,000	1,247,000
Pit Dewatering	-	-	-	426,011	426,011
<b>Total Combined Peak Inflows</b>	2,267,000	1,664,000	262,922	1,746,000	1,766,000
<b>Peak Outflows</b>					
Evaporation	28,076	23,861	1,430	474	941
Process Plants Reclaim	-	-	-	673,882	600,633
Treated and Discharged	852,250	852,250	261,492	852,250	852,250
<b>Total Combined Peak Outflows</b>	880,326	876,111	262,922	1,526,606	1,454,000

## 5.2 Daily Simulation

This section presents a summary of the simulation results for snapshot years during the mine’s operation, highlighting both maximum and minimum flows.

**Table 5-3 Summary of the Water Balance Model Results for Year -1**

Storage Facility	Year (-1) Flows		
	Collection Pond 1	Collection Pond 3	Temporary Construction Pond
	(m <sup>3</sup> /day)	(m <sup>3</sup> /day)	(m <sup>3</sup> /day)
Peak Inflows	412,410	27,823	41,892
Average Inflow	25,759	1,911	11,260
Peak Outflows <sup>(1)</sup>	30,096	10,069	28,078
Average Outflows <sup>(1)</sup>	25,943	1,943	13,450

**Note:** <sup>(1)</sup> includes evaporation and dust suppressant use.

**Table 5-4 Summary of the Water Balance Model Results for Year 2**

Storage Facility	Year (2)		
	Collection Pond 1	Collection Pond 3	Temporary Construction Pond
	(m <sup>3</sup> /day)	(m <sup>3</sup> /day)	(m <sup>3</sup> /day)
Peak Inflows	511,296	53,522	21,836
Average Inflow	31,878	3,858	1,305
Peak Outflows <sup>(1)</sup>	30,326	10,088	21,836
Average Outflows <sup>(1)</sup>	27,005	3,742	1,305

**Note:** <sup>(1)</sup> includes evaporation and dust suppressant use.

**Table 5-5 Summary of the Water Balance Model Results for Year 4**

Storage Facility	Year (4)				
	Collection Pond 1	Collection Pond 2	Collection Pond 3	NE Collection Pond	NW Collection Pond
	(m <sup>3</sup> /day)	(m <sup>3</sup> /day)	(m <sup>3</sup> /day)	(m <sup>3</sup> /day)	(m <sup>3</sup> /day)
Peak Inflows	521,978	81,823	53,522	273,564	278,981
Average Inflow	32,602	5,054	3,866	20,690	21,028
Peak Outflows <sup>(1)</sup>	30,491	30,322	10,088	39,283	39,575
Average Outflows <sup>(1)</sup>	29,282	4,968	3,698	20,562	21,059

**Note:** <sup>(1)</sup> includes evaporation and dust suppressant use.

**Table 5-6 Summary of the Water Balance Model Results for Year 23**

Storage Facility	Year (23)			
	Collection Pond 1	Collection Pond 2	Collection Pond 3	NW Collection Pond
	(m <sup>3</sup> /day)	(m <sup>3</sup> /day)	(m <sup>3</sup> /day)	(m <sup>3</sup> /day)
Peak Inflows	521,978	377,013	53,522	53,212
Average Inflow	32,602	23,535	3,866	7,371
Peak Outflows <sup>(1)</sup>	30,778	30,592	10,088	44,456
Average Outflows <sup>(1)</sup>	29,415	23,517	3,698	7,445

**Table 5-7 Summary of the Water Balance Model Results for Year 35**

Storage Facility	Year (35)	
	Collection Pond 2	Collection Pond 3
	(m <sup>3</sup> /day)	(m <sup>3</sup> /day)
Peak Inflows	182,364	53,522
Average Inflow	11,377	3,866
Peak Outflows <sup>(1)</sup>	29,045	10,088
Average Outflows <sup>(1)</sup>	11,365	3,725

**Note:** <sup>(1)</sup> includes evaporation and dust suppressant use.

**Table 5-8 Summary of the Water Balance Model Results for Year 41**

Storage Facility	Year (41)	
	Collection Pond 2	Collection Pond 3
	(m <sup>3</sup> /day)	(m <sup>3</sup> /day)
Peak Inflows	118,060	19,759
Average Inflow	7,361	136
Peak Outflows <sup>(1)</sup>	29,045	10,000
Average Outflows <sup>(1)</sup>	7,377	1,232

**Note:** <sup>(1)</sup> includes evaporation and dust suppressant use.

**Table 5-9 Summary of the Water Balance Model Results for Pit Lake Outflows**

Storage Facility	Discharge from Pit Lake via closure spillway	
	To North Driftwood River	To West Buskegau
	(m <sup>3</sup> /day)	(m <sup>3</sup> /day)
Peak	324,438	191,149
Average	20,733	12,783

### 5.3 Design Storms

The results indicate that the Collection Ponds and pit storage are able to manage the design storms within the project site, without release to the environment. The table below compares the onsite storage capacities available under normal conditions, as well as 1/10-year, 24-hour and 1/100-year, 24-hour design storm events. The active storage outlined in the table reflects the design storage volume, including the freeboard considerations.

**Table 5-10 Summary Water Storage Volume for Different Scenarios**

Storage Facility	Active Storage <sup>(1)</sup>	Permanent Storage	1/10-year, 24-hour Storm			1/100-year, 24-hour Storm		
			Inflow Volume	High-Water level <sup>(2)</sup>	Available Freeboard	Inflow Volume	High-Water level <sup>(2)</sup>	Available Freeboard
	(m <sup>3</sup> )	(m <sup>3</sup> )	(m <sup>3</sup> /d)	(m)	(m)	(m <sup>3</sup> /d)	(m)	(m)
Collection Pond 1	2,033,333	1,016,667	1,196,054	4.4	1.6	1,837,839	5.6	0.4
Collection Pond 2	2,160,000	1,080,000	828,938	3.5	2.5	1,273,734	4.4	1.6
Collection Pond 3	160,000	80,000	102,933	4.6	1.4	158,165	5.9	0.1
NE Collection Pond	1,764,706	735,294	1,617,527	6.4	0.4	2,421,964	6.8	0 <sup>(3)</sup>
NW Collection Pond	2,400,000	1,000,000	1,603,751	5.2	1.6	2,464,300	6.8	0 <sup>(3)</sup>

- (1) Designed active storage volume including freeboard allowance.
- (2) Including the 2 m permanent pond elevation
- (3) Excess water in the pond will be returned to the Open Pits.

## 6.0 Discussion and Conclusion

The following key conclusions can be drawn from the water balance simulations conducted for the Crawford project:

- The site water management infrastructures are able to contain and manage the 1/10 and 1/100-year, 24-hour storm events.
- Peak treatment rates of 10,000 m<sup>3</sup>/day to 28,000 m<sup>3</sup>/day at each of the water management ponds are required to manage typical inflows. Larger events will be stored and attenuated within the ponds or within the Pits.
- The water balance simulations demonstrate that adequate makeup water will be available to meet operational needs throughout the mine's lifespan. Makeup water will primarily be sourced from pit dewatering, supplemented by water from TMF Collection Ponds.
- It is estimated that following closure, the pits will take approximately 117 years (i.e. mine year 159) to fill and form a pit lake.

As the project evolves, it will be essential to continue assessing water balance dynamics and adjusting management strategies accordingly to mitigate any potential risks or changes.

It is important to note that the water balance presented here is based on design components that are currently undergoing development, as well as the available data and assumptions presented in this report.

## 7.0 Closure

We sincerely appreciate the opportunity to have assisted you with this project.

Report prepared by:  
**Ausenco Sustainability ULC**

**ORIGINAL SIGNED  
AND STAMPED**

Jonathan Cooper, M.Sc., P.Eng.  
Senior Water Resource Engineer

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## 8.0 References

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# **Appendix A**

## **Daily Climate Adjusted Data Provided by Stantec**

Month	Day	TAVG_adjusted (°C)	PRCP_adjusted (mm)	Rain_adjusted (mm)	Snow_adjusted (mm WE)
1	1	-23.8	0	0	0
1	2	-18.8	2.28	0	2.28
1	3	-11.9	15.048	0	15.048
1	4	-17.6	1.14	0	1.14
1	5	-15.2	0.228	0	0.228
1	6	-16.1	0.912	0	0.912
1	7	-22.1	0	0	0
1	8	-13	0.684	0	0.684
1	9	-19.5	0	0	0
1	10	-16.2	1.368	0	1.368
1	11	-24	0	0	0
1	12	-25.7	0	0	0
1	13	-28.3	0	0	0
1	14	-24.6	0	0	0
1	15	-16	0	0	0
1	16	-4	21.204	0	21.204
1	17	5	0	0	0
1	18	4.7	2.508	2.508	0
1	19	-3.4	3.648	0	3.648
1	20	-13.9	0.684	0	0.684
1	21	-14.2	0	0	0
1	22	-10.2	3.192	0	3.192
1	23	-0.3	11.172	0	11.172
1	24	-5.9	3.648	0	3.648
1	25	-8.2	0	0	0
1	26	-1.9	1.596	0	1.596
1	27	-10.1	0	0	0
1	28	-12.2	0	0	0
1	29	-12.7	1.368	0	1.368
1	30	-5.5	0.456	0	0.456
1	31	0.1	0	0	0
2	1	1.5	0	0	0
2	2	3.2	3.876	3.876	0
2	3	3.8	0.684	0.684	0
2	4	-5.1	3.192	0	3.192
2	5	-12	3.42	0	3.42
2	6	-8.9	0	0	0
2	7	-6.4	2.052	0	2.052
2	8	-6.2	1.596	0	1.596
2	9	2.9	0.228	0.228	0
2	10	-5.8	0	0	0
2	11	5.5	5.472	5.472	0
2	12	3.6	1.14	1.14	0
2	13	-10.2	0.684	0	0.684
2	14	-4.2	0	0	0
2	15	-3.6	0	0	0

2	16	-9.7	0	0	0
2	17	-8.3	10.26	0	10.26
2	18	-9.9	0.912	0	0.912
2	19	-9.5	0	0	0
2	20	-9.4	0	0	0
2	21	-14.4	0	0	0
2	22	-15.8	0	0	0
2	23	-8.4	0	0	0
2	24	-6.6	0	0	0
2	25	-3.1	0	0	0
2	26	-3.2	0	0	0
2	27	2.4	0	0	0
2	28	2.7	40.584	40.584	0
3	1	-5.1	0.912	0	0.912
3	2	-5.6	0	0	0
3	3	-8.6	0.456	0	0.456
3	4	-12.8	0	0	0
3	5	-15.6	0	0	0
3	6	-19.3	0	0	0
3	7	-15.1	0	0	0
3	8	-6.9	0	0	0
3	9	-5.4	0	0	0
3	10	-6.1	0	0	0
3	11	-6.5	0	0	0
3	12	-6.7	0	0	0
3	13	-6.5	0	0	0
3	14	-1.5	0	0	0
3	15	-0.2	0	0	0
3	16	4.3	3.876	3.876	0
3	17	5.2	7.296	7.296	0
3	18	0.8	14.82	14.82	0
3	19	-1.8	0	0	0
3	20	0.3	0.684	0.684	0
3	21	3.1	3.192	3.192	0
3	22	-2.5	0	0	0
3	23	0.3	0.912	0.912	0
3	24	-3	0.228	0	0.228
3	25	-0.6	0.228	0	0.228
3	26	3.6	0	0	0
3	27	9.3	0	0	0
3	28	9.6	0	0	0
3	29	9.5	0	0	0
3	30	8	0	0	0
3	31	4.3	11.4	11.4	0
4	1	3.9	0	0	0
4	2	3.2	2.736	2.736	0
4	3	2.6	2.052	2.052	0

4	4	1.7	0	0	0
4	5	5.3	0	0	0
4	6	9.2	14.478	14.478	0
4	7	10.1	11.856	11.856	0
4	8	7.2	1.368	1.368	0
4	9	5.2	0	0	0
4	10	3.6	0	0	0
4	11	3.4	0	0	0
4	12	4.4	0	0	0
4	13	7.7	0	0	0
4	14	8.3	0	0	0
4	15	6.8	0	0	0
4	16	7.4	0	0	0
4	17	7.9	0	0	0
4	18	7	0	0	0
4	19	6.7	0	0	0
4	20	7.2	0	0	0
4	21	10.4	0	0	0
4	22	5.2	0	0	0
4	23	2.8	0	0	0
4	24	11.2	0	0	0
4	25	13.3	0	0	0
4	26	7.1	0	0	0
4	27	8	0	0	0
4	28	11.3	0	0	0
4	29	11.7	0	0	0
4	30	13.7	0	0	0
5	1	17.2	0	0	0
5	2	21.8	0	0	0
5	3	21	0	0	0
5	4	20.6	0	0	0
5	5	20.9	0	0	0
5	6	24.1	0.912	0.912	0
5	7	21.5	0	0	0
5	8	16.2	0	0	0
5	9	6.3	0	0	0
5	10	10.4	0	0	0
5	11	10.4	0	0	0
5	12	8.3	0	0	0
5	13	10.1	0	0	0
5	14	16.2	0	0	0
5	15	17.7	0	0	0
5	16	22.7	0	0	0
5	17	21.7	1.596	1.596	0
5	18	15.8	16.416	16.416	0
5	19	8.4	1.368	1.368	0
5	20	8.8	3.42	3.42	0

5	21	13.8	11.172	11.172	0
5	22	10.5	0	0	0
5	23	10.9	1.14	1.14	0
5	24	13	23.94	23.94	0
5	25	12.9	14.592	14.592	0
5	26	13.6	1.14	1.14	0
5	27	17.9	0	0	0
5	28	20.9	0	0	0
5	29	23.5	0	0	0
5	30	26.2	0	0	0
5	31	18.3	16.644	16.644	0
6	1	10.6	0.912	0.912	0
6	2	16.5	4.56	4.56	0
6	3	15.7	0	0	0
6	4	15.5	0	0	0
6	5	25	0.456	0.456	0
6	6	27.9	4.56	4.56	0
6	7	26.5	8.892	8.892	0
6	8	17.7	0.456	0.456	0
6	9	20	0	0	0
6	10	25.8	4.104	4.104	0
6	11	25.4	23.712	23.712	0
6	12	25.1	0	0	0
6	13	22.4	1.368	1.368	0
6	14	12.6	11.628	11.628	0
6	15	9.9	0.684	0.684	0
6	16	10	0	0	0
6	17	13.8	3.42	3.42	0
6	18	16.7	0	0	0
6	19	20.2	2.28	2.28	0
6	20	20.1	0	0	0
6	21	21.7	0	0	0
6	22	23.4	0	0	0
6	23	26.1	0	0	0
6	24	25.4	0.912	0.912	0
6	25	23.5	0	0	0
6	26	24.4	0.912	0.912	0
6	27	27.6	12.882	12.882	0
6	28	24.1	10.26	10.26	0
6	29	15.5	24.168	24.168	0
6	30	19.1	0	0	0
7	1	19.2	0	0	0
7	2	21.6	0.228	0.228	0
7	3	23.4	2.508	2.508	0
7	4	27.8	14.136	14.136	0
7	5	20.3	3.192	3.192	0
7	6	20.8	7.98	7.98	0

7	7	17.2	4.332	4.332	0
7	8	19.7	0	0	0
7	9	16.6	0	0	0
7	10	17.5	0.684	0.684	0
7	11	20.8	0.228	0.228	0
7	12	24.4	0	0	0
7	13	24.4	0	0	0
7	14	25.5	2.964	2.964	0
7	15	25.6	0	0	0
7	16	26.9	0	0	0
7	17	22.2	0	0	0
7	18	19.5	0	0	0
7	19	21.3	0	0	0
7	20	23.2	0	0	0
7	21	26.8	0	0	0
7	22	28.2	1.368	1.368	0
7	23	25.8	0	0	0
7	24	27.3	0.456	0.456	0
7	25	23	2.28	2.28	0
7	26	23.3	0	0	0
7	27	24.1	0	0	0
7	28	23.1	0.684	0.684	0
7	29	23.5	16.416	16.416	0
7	30	27.8	0	0	0
7	31	23.8	15.504	15.504	0
8	1	19.4	0.684	0.684	0
8	2	18.3	1.824	1.824	0
8	3	20.6	0.456	0.456	0
8	4	18.1	4.56	4.56	0
8	5	15.6	4.332	4.332	0
8	6	16.8	7.98	7.98	0
8	7	12.5	28.044	28.044	0
8	8	16	1.824	1.824	0
8	9	16.1	0	0	0
8	10	15.8	0	0	0
8	11	22.4	0.912	0.912	0
8	12	18.9	1.368	1.368	0
8	13	14.5	29.184	29.184	0
8	14	16.1	0	0	0
8	15	18.8	0.228	0.228	0
8	16	20.8	4.56	4.56	0
8	17	15.6	5.7	5.7	0
8	18	15.6	0	0	0
8	19	17.4	0	0	0
8	20	19.7	0	0	0
8	21	21.5	0	0	0
8	22	21.3	0	0	0

8	23	22.4	0	0	0
8	24	23.7	0	0	0
8	25	24.4	0	0	0
8	26	24.5	0	0	0
8	27	26	0	0	0
8	28	19.5	0	0	0
8	29	12.3	1.14	1.14	0
8	30	15.5	0	0	0
8	31	18.8	0	0	0
9	1	24.5	0	0	0
9	2	23	0	0	0
9	3	22.5	0	0	0
9	4	27	0	0	0
9	5	23.8	0	0	0
9	6	20.6	0	0	0
9	7	17.9	0	0	0
9	8	20.3	1.14	1.14	0
9	9	19.8	1.368	1.368	0
9	10	15.3	1.824	1.824	0
9	11	14.8	2.052	2.052	0
9	12	15.9	10.488	10.488	0
9	13	18.8	17.1	17.1	0
9	14	16.8	1.596	1.596	0
9	15	13.8	0.228	0.228	0
9	16	12.9	0	0	0
9	17	14.7	0	0	0
9	18	16.8	0	0	0
9	19	16.1	23.484	23.484	0
9	20	7.4	0.228	0.228	0
9	21	8.7	0	0	0
9	22	15.3	0	0	0
9	23	11.7	0.456	0.456	0
9	24	10.7	0	0	0
9	25	10.6	0	0	0
9	26	17	0	0	0
9	27	17.4	8.664	8.664	0
9	28	13.2	10.488	10.488	0
9	29	11.5	1.824	1.824	0
9	30	11.4	0	0	0
10	1	6.9	11.856	11.856	0
10	2	6.8	5.7	5.7	0
10	3	5	0	0	0
10	4	5.8	0	0	0
10	5	7.2	7.98	7.98	0
10	6	1.3	0	0	0
10	7	1.3	10.944	10.944	0
10	8	8.6	42.864	42.864	0

10	9	9.7	0	0	0
10	10	12.8	1.368	1.368	0
10	11	9.6	0	0	0
10	12	7	10.716	10.716	0
10	13	7.3	0.228	0.228	0
10	14	5.3	1.14	1.14	0
10	15	9.3	5.016	5.016	0
10	16	8.7	9.576	9.576	0
10	17	4.6	2.28	2.28	0
10	18	2	0	0	0
10	19	5.3	1.368	1.368	0
10	20	6.7	2.736	2.736	0
10	21	7.1	5.7	5.7	0
10	22	7.6	27.132	27.132	0
10	23	3.8	5.472	5.472	0
10	24	1.8	0.684	0.684	0
10	25	3.8	0	0	0
10	26	5	0.456	0.456	0
10	27	2.7	0.228	0.228	0
10	28	7.5	0.228	0.228	0
10	29	6.7	4.788	4.788	0
10	30	15.4	9.576	9.576	0
10	31	10.5	0.456	0.456	0
11	1	12.8	0	0	0
11	2	5.4	0.684	0.684	0
11	3	0.5	10.032	10.032	0
11	4	2.9	1.596	1.596	0
11	5	8.1	0.228	0.228	0
11	6	4.1	0	0	0
11	7	-0.6	0	0	0
11	8	4.7	0	0	0
11	9	11.4	0	0	0
11	10	1.5	0	0	0
11	11	-0.8	0	0	0
11	12	3.4	3.648	3.648	0
11	13	6.8	4.788	4.788	0
11	14	3.6	2.28	2.28	0
11	15	-2.1	3.42	0	3.42
11	16	-2.1	1.596	0	1.596
11	17	-1.3	4.104	0	4.104
11	18	-6.6	1.14	0	1.14
11	19	1.3	4.56	4.56	0
11	20	0	0.456	0.456	0
11	21	1.4	0	0	0
11	22	8.3	0.456	0.456	0
11	23	7	11.4	11.4	0
11	24	7.2	7.752	7.752	0

11	25	3.2	0	0	0
11	26	2.7	0	0	0
11	27	4.1	4.332	4.332	0
11	28	0.3	5.7	5.7	0
11	29	-3.3	0.684	0	0.684
11	30	-3.5	0.228	0	0.228
12	1	2.8	0.456	0.456	0
12	2	7.3	0	0	0
12	3	6.5	0.456	0.456	0
12	4	7	0.228	0.228	0
12	5	4.4	0.912	0.912	0
12	6	-1	0	0	0
12	7	1.3	0	0	0
12	8	5	0	0	0
12	9	7	10.944	10.944	0
12	10	1.2	6.156	6.156	0
12	11	-1.8	0	0	0
12	12	-0.6	0.456	0	0.456
12	13	3.3	0	0	0
12	14	1.3	0	0	0
12	15	2.8	7.524	7.524	0
12	16	-3.4	5.016	0	5.016
12	17	-12	0.456	0	0.456
12	18	-10.4	0	0	0
12	19	-2.9	0	0	0
12	20	0.6	7.98	7.98	0
12	21	-10	0.684	0	0.684
12	22	-14.3	0	0	0
12	23	-15.9	0	0	0
12	24	-15.3	0.228	0	0.228
12	25	-5.5	1.368	0	1.368
12	26	-4.7	1.824	0	1.824
12	27	-15.9	0	0	0
12	28	-11.7	4.332	0	4.332
12	29	-12.6	13.224	0	13.224
12	30	-17	0	0	0
12	31	-13.4	1.368	0	1.368

Notes:

Typical Year for Future Climate (2071-2100) for SSP2-4.5

1. Comparison between baseline climate normal precipitation distribution curves and climate projected models precipitation distribution to validate any changes in distribution.

2. Once validated, precipitation related indices (total annual precipitation, winter and summer precipitation, dry days, dry spell, wet days (1mm, 5mm, 10mm, 20mm, 100mm), maximum 1,3,5 day precipitation were calculated for each year and averaged.

3. KS test were performed to identify which year is closest to the climate normal distribution.

4. Using the aforementioned metrics, each year was compared to the climatic baseline and the year 1999 was selected as the typical year.

5. A 14% increase based on total annual precipitation changes under SSP2-4.5 was applied to the daily total precipitation in 1999 adjust to climate change.

6. A +5.3°C, +3.9°C, +3.7°C, +3.6°C seasonal increase based on SS2-4.5 to temperature was added to the daily mean temperature in 1999 for winter, spring, summer autumn respectively.

7. To calculate rainfall and snowfall data from the future climate adjusted total precipitation, daily mean temperature of 0°C was used as a threshold. When daily mean temperature  $\geq 0$ , it is considered as rainfall and for daily mean temperature  $< 0$ , it is considered as snowfall.

Month	tas (degC)
January	-10.84
February	-9.80095
March	-4.04872
April	5.488623
May	12.88819
June	18.65433
July	21.44038
August	20.2083
September	15.15563
October	8.451451
November	0.757383
December	-6.89766

Notes:

The SSP2-4.5 temperature data was derived from CanDCS-u6 26 models ensemble for the period of 2071-2100.

Table 1. Timmins Climate Station IDF predicted under CMIP6 2071-2100 SSP2-4.5 - Median Model Results

Duration	Total Rainfall (mm)					
	2-year Return Period	5-year Return Period	10-year Return Period	25-year Return Period	50-year Return Period	100-year Return Period
5 min	8.83	11.50	13.33	15.58	17.25	18.92
10 min	12.83	17.33	20.33	24.00	26.83	29.67
15 min	15.25	20.75	24.50	29.00	32.50	36.00
30 min	19.50	27.50	33.00	40.00	45.00	50.00
1-hour	24.00	33.00	39.00	48.00	53.00	59.00
2-hour	28.00	38.00	44.00	52.00	60.00	64.00
6-hour	37.80	52.80	60.00	78.00	84.00	96.00
12-hour	46.80	64.80	79.20	94.80	105.60	117.60
24-hour	60.00	84.00	98.40	120.00	136.80	151.20

Source: ClimateData.ca

Timmins Composite Station	2071-2100 Wet			2071-2100 Dry	
	2071-2100 Climate Normal	50-year	100-year	50-year	100-year
	Total Precipitation (mm)				
January	71.33	86.96	91.09	35.83	30.19
February	55.84	68.07	71.31	28.05	23.63
March	65.69	80.08	83.89	32.99	27.80
April	60.93	74.28	77.81	30.60	25.79
May	75.93	92.56	96.97	38.14	32.13
June	84.41	102.90	107.80	42.40	35.72
July	84.83	103.41	108.33	42.61	35.90
August	78.29	95.44	99.98	39.32	33.13
September	93.46	113.94	119.35	46.94	39.55
October	80.88	98.60	103.29	40.62	34.23
November	87.38	106.52	111.59	43.89	36.98
December	75.57	92.13	96.51	37.96	31.98
Annual	914.54	1114.90	1167.92	459.34	387.03

Notes

The 2071 – 2100 climate normal total precipitation was generated using the CanDCS-u6 26 models ensemble.

A GEV extreme precipitation block maxima and minima distribution curve is fitted to obtain the 50 year and 100 year return period annual total precipitation amounts for the wet and dry year, respectively, for each of the 26 models within the SSP2-4.5 CMIP6 ensemble. The monthly wet and dry return period quantities are based on relative percentages of annual precipitation for the 2071-2100 climate normal monthly amounts.

Timmins Composite Station	2071-2100 Climate Normal	2071-2100 Wet		2071-2100 Dry	
		50-year	100-year	50-year	100-year
	Total Rainfall (mm)				
January	2.24	3.24	3.41	1.49	1.40
February	3.68	5.31	5.59	2.44	2.29
March	18.59	26.83	28.27	12.31	11.59
April	46.96	67.78	71.43	31.09	29.27
May	73.67	106.32	112.04	48.77	45.91
June	82.98	119.76	126.20	54.93	51.71
July	85.44	123.32	129.95	56.56	53.25
August	81.66	117.86	124.19	54.06	50.89
September	93.67	135.20	142.47	62.01	58.38
October	76.71	110.71	116.66	50.78	47.81
November	43.69	63.06	66.45	28.93	27.23
December	9.83	14.19	14.95	6.51	6.13
Annual	619.11	893.58	941.62	409.87	385.86

Notes

The SSP2-4.5 rainfall and snowfall data were derived from total precipitation in the CanDCS-u6 26 models ensemble for the period of 2071-2100. The snowfall variable is estimated using the auer snowfall approximation with a threshold of 0 degC and the rainfall is then calculated by subtract snowfall from the total precipitation variable.

The monthly wet and dry return period quantities are based on relative percentages of annual precipitation for the 2071-2111 climate normal monthly amounts.

Timmins Composite Station	2071-2100 Climate Normal	2071-2100 Wet		2071-2100 Dry	
		50-year	100-year	50-year	100-year
<b>Total Snowfall (mm water equivalent)</b>					
January	67.48	103.27	109.56	36.34	32.14
February	49.13	75.20	79.77	26.46	23.40
March	45.18	69.16	73.36	24.33	21.52
April	13.74	21.02	22.30	7.40	6.54
May	1.68	2.57	2.72	0.90	0.80
June	0.02	0.03	0.03	0.01	0.01
July	0.00	0.00	0.00	0.00	0.00
August	0.00	0.00	0.00	0.00	0.00
September	0.13	0.19	0.21	0.07	0.06
October	7.19	11.00	11.67	3.87	3.43
November	41.94	64.19	68.10	22.59	19.98
December	64.82	99.21	105.25	34.91	30.88
Annual	291.31	445.85	472.98	156.87	138.77

#### Notes

The SSP2-4.5 rainfall and snowfall data were derived from total precipitation in the CanDCS-u6 26 models ensemble for the period of 2071-2100. The snowfall variable is estimated using the auer snowfall approximation with a threshold of 0 degC and the rainfall is then calculated by subtract snowfall from the total precipitation variable.

The monthly wet and dry return period quantities are based on relative percentages of annual precipitation for the 2071-2111 climate normal monthly amounts.

Table 2. Timmins Climate Station Wet Year, Dry Year, and CMIP6 2071-2100 SSP2-4.5 Climate Normal - Annual & Monthly Precipitation (mm)

Condition ->	wet		dry		2071-2100 Climate Normal
	1:50	1:100	1:50	1:100	
January	109.0	116.3	52.0	49.8	71.3
February	85.3	91.0	40.7	39.0	55.8
March	100.4	107.1	47.9	45.9	65.7
April	93.1	99.3	44.5	42.6	60.9
May	116.0	123.8	55.4	53.0	75.9
June	129.0	137.6	61.6	59.0	84.4
July	129.6	138.3	61.9	59.2	84.8
August	119.6	127.6	57.1	54.7	78.3
September	142.8	152.3	68.2	65.3	93.5
October	123.6	131.8	59.0	56.5	80.9
November	133.5	142.4	63.8	61.0	87.4
December	115.5	123.2	55.1	52.8	75.6
<b>Annual</b>	1397.2	1490.8	667.3	638.7	914.5

Note: Wet and dry annual return period values calculated as a relative percent difference factor with 2071-2100 climate normal. Monthly wet and dry quantities are based on relative percentage to annual adapted from 2071-2100 climate normal monthly quantities.

The relative percent difference factors for the wet and dry return periods were calculated by comparison of 1991-2020 climate normal annual precipitation to outputs from a GEV distribution fitted to historic aggregated Timmins ECCC climate station data.

<b>Timmins</b>		
Month	Rainfall (mm)	Snowfall (mm)
January	2.2	67.5
February	3.7	49.1
March	18.6	45.2
April	47.0	13.7
May	73.7	1.7
June	83.0	0.0
July	85.4	0.0
August	81.7	0.0
September	93.7	0.1
October	76.7	7.2
November	43.7	41.9
December	9.8	64.8
Annual	619.1	291.3

Notes

The SSP2-4.5 rainfall and snowfall data were derived from total precipitation in the CanDCS-u6 26 models ensemble for the period of 2071-2100. The snowfall variable is estimated using the auer snowfall approximation with a threshold of 0 degC and the rainfall is then calculated by subtract snowfall from the total precipitation variable.

# **Appendix B**

## **Overview of Mine Facility Footprint**

Appendix B Overview of Mine Facility Footprint

Year	Clay Impoundment - Pond 1 Catchment	Clay Impoundment	Reclaimed portion of Clay Impoundment	Rock Impoundment - Pond 2 Catchment	Rock Impoundment	Reclaimed portion of Rock Impoundment	Pond 3 Catchment - East Stockpile North	East Stockpile North	Reclaimed portion of East Stockpile North	Bump Catchment - East Stockpile South	East Stockpile South	Reclaimed portion of East Stockpile South	Pond 2 Catchment - West Stockpile	West Stockpile	Reclaimed portion of West Stockpile	Process Plant	TMF	Reclaimed portion of TMF
-3	0	0	0	0	0	0	60,000	1,277	0	168,000	519	0	0	0	0	926,125	6,239,715	0
-2	2,830,009	15,184,377	0	0	0	0	60,000	272,324	0	168,000	432,384	0	0	0	0	926,125	6,239,715	0
-1	2,830,009	15,184,377	0	0	0	0	60,000	1,455,633	0	168,000	432,384	0	0	0	0	926,125	6,239,715	0
1	2,830,009	19,687,862	0	0	0	0	60,000	1,455,633	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
2	2,830,009	19,687,862	0	0	0	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
3	2,830,009	19,687,862	0	0	0	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
4	2,830,009	20,176,488	0	208,684	2,821,982	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
5	2,830,009	20,176,488	0	208,684	11,718,271	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
6	2,830,009	20,176,488	0	208,684	11,718,271	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
7	2,830,009	20,176,488	0	208,684	11,717,571	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
8	2,830,009	20,176,488	0	208,684	11,717,571	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
9	2,830,009	20,176,488	0	208,684	11,715,971	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
10	2,830,009	20,176,488	0	208,684	11,715,971	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
11	2,830,009	20,176,488	0	208,684	11,715,971	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
12	2,830,009	20,176,488	0	208,684	11,716,171	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
13	2,830,009	20,176,488	0	208,684	11,716,171	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
14	2,830,009	20,176,488	0	208,684	11,716,171	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
15	2,830,009	20,176,488	0	208,684	11,715,471	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
16	2,830,009	20,176,488	0	208,684	11,715,471	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
17	2,830,009	20,176,488	0	208,684	11,714,771	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
18	2,830,009	20,176,488	0	208,684	11,714,771	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
19	2,830,009	20,176,488	0	208,684	11,714,771	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
20	2,830,009	20,176,488	0	208,684	11,714,071	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
21	2,830,009	20,176,488	0	208,684	11,713,371	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
22	2,830,009	20,176,488	0	208,684	11,713,371	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
23	2,830,009	20,176,488	0	208,684	11,709,271	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
24	2,830,009	20,176,488	0	208,684	11,708,571	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
25	2,830,009	20,176,488	0	208,684	11,708,571	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
26	2,830,009	20,176,488	0	208,684	11,707,871	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
27	2,830,009	20,176,488	0	208,684	11,707,871	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
28	2,830,009	20,176,488	0	208,684	11,707,871	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
29	2,830,009	20,176,488	0	208,684	11,707,871	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
30	0	20,155,698	10,400	0	11,697,471	10,400	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
31	0	15,104,124	5,051,575	0	8,760,103	2,937,368	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
32	0	10,992,749	3,864,336	0	2,895,168	5,864,336	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
33	0	15,133,524	8,178,933	0	0	8,178,933	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
34	0	0	0	0	0	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
35	0	20,175,098	0	0	0	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
36	0	20,175,098	0	0	0	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
37	0	20,175,098	0	0	0	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
38	0	20,175,098	0	0	0	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
39	0	20,175,098	0	0	0	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
40	0	20,175,098	0	0	0	0	60,000	526,259	0	168,000	213,742	0	715,228	1,150,866	0	926,125	17,161,837	0
41	0	20,175,098	0	0	0	0	60,000	526,259	0	168,000	213,742	0	715,228	1,150,866	0	926,125	17,161,837	0
42	0	20,175,098	0	0	0	0	60,000	526,259	0	168,000	16,248	0	715,228	1,150,866	0	926,125	17,161,837	0
43	0	20,175,098	0	0	0	0	60,000	526,015	243	168,000	16,248	0	715,228	1,150,866	0	926,125	17,161,837	0
44	0	20,175,098	0	0	0	0	60,000	151,927	603,976	0	0	0	715,228	1,150,866	0	926,125	17,161,837	0
45	0	20,175,098	0	0	0	0	60,000	1,811,438	0	168,000	521,393	0	715,228	1,150,866	0	926,125	17,161,837	0
46	0	20,175,098	0	0	0	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
47	0	20,175,098	0	0	0	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
48	0	20,175,098	0	0	0	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
49	0	20,175,098	0	0	0	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
50	0	20,175,098	0	0	0	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
51	0	20,175,098	0	0	0	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
52	0	20,175,098	0	0	0	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,866	0	926,125	17,161,837	0
53	0	20,175,098	0	0	0	0	60,000	2,415,169	0	168,000	695,094	0	715,228	1,150,8				

# **Appendix C**

## **Monthly Water Balance Model Results Throughout the Life of Mine**

Appendix C - Monthly Water Balance Results for Ponds throughout Life of Mine

Mine Life Year	Total Inflow into Collection Pond 1 m <sup>3</sup> /year	Total Outflow from Collection Pond 1 m <sup>3</sup> /year	Total Inflow into Collection Pond 2 m <sup>3</sup> /year	Total Outflow into Collection Pond 2 m <sup>3</sup> /year	Total Inflow into Collection Pond 3 m <sup>3</sup> /year	Total Outflow into Collection Pond 3 m <sup>3</sup> /year	Total Inflow into Collection NEP m <sup>3</sup> /year	Total Outflow into Collection NEP m <sup>3</sup> /year	Total Inflow into Collection NWP m <sup>3</sup> /year	Total Outflow into Collection NWP m <sup>3</sup> /year	Total Pit Inflow (MZ+EZ) m <sup>3</sup> /year	Total Pit Dewatering m <sup>3</sup> /year
Year -3	8,695,016	8,034,778	102,600	0	102,600	102,600	0	0	0	0	3,035,237	3,035,237
Year -2	8,696,338	9,012,618	240,941	0	240,941	240,941	0	0	0	0	7,075,510	6,947,086
Year -1	8,696,338	9,110,573	634,680	0	634,680	634,680	0	0	0	0	8,264,724	8,131,708
Year 1	8,696,338	9,186,396	911,545	0	911,545	911,545	6,494,693	6,550,823	0	0	8,519,368	8,488,664
Year 2	10,789,380	9,205,975	1,276,891	0	1,276,891	1,276,891	6,491,181	6,550,735	0	0	8,575,102	8,486,004
Year 3	10,791,021	10,617,575	1,277,085	0	1,277,085	1,277,085	6,564,272	7,111,948	0	0	8,827,098	8,732,438
Year 4	11,016,314	10,693,735	1,277,085	2,826,619	1,277,085	1,277,085	6,601,364	7,118,188	6,715,406	7,160,880	8,969,414	8,860,814
Year 5	11,016,314	10,700,849	1,277,085	6,359,353	1,277,085	1,277,085	6,324,181	6,331,804	6,438,245	6,623,484	9,667,324	9,447,036
Year 6	11,016,314	10,864,376	1,276,891	6,187,005	1,276,891	1,276,891	8,617,503	7,999,950	8,730,229	8,896,293	9,819,006	9,715,540
Year 7	11,016,314	10,873,045	1,277,085	6,206,358	1,277,085	1,277,085	8,625,850	9,509,774	8,740,422	8,896,506	9,837,471	9,739,809
Year 8	11,016,314	10,801,447	1,277,085	6,518,987	1,277,085	1,277,085	8,624,258	9,509,767	8,738,831	8,896,497	9,837,471	9,736,083
Year 9	11,016,314	10,797,276	1,277,085	6,322,760	1,277,085	1,277,085	8,201,908	9,505,927	8,317,482	8,892,022	9,849,204	9,747,326
Year 10	11,016,314	10,774,967	1,276,891	6,901,615	1,276,891	1,276,891	8,241,693	7,996,428	8,352,250	8,882,050	10,026,710	9,900,676
Year 11	11,016,314	10,837,820	1,277,085	7,520,481	1,277,085	1,277,085	8,282,100	9,505,504	8,396,673	8,874,413	10,164,100	10,047,252
Year 12	11,016,314	10,772,375	1,277,085	7,314,683	1,277,085	1,277,085	8,282,543	9,505,514	8,398,116	8,874,418	10,164,100	10,050,032
Year 13	11,016,314	10,727,189	1,277,085	8,334,435	1,277,085	1,277,085	8,288,583	9,506,549	8,404,156	8,872,443	10,214,967	10,075,733
Year 14	11,016,314	10,785,004	1,276,891	7,807,843	1,276,891	1,276,891	8,432,736	9,504,457	8,548,292	8,838,996	10,745,188	10,617,382
Year 15	11,016,314	10,731,576	1,277,085	8,339,632	1,277,085	1,277,085	8,593,963	9,269,148	8,709,525	8,389,680	13,406,022	13,262,672
Year 16	11,016,314	10,790,398	1,277,085	8,394,095	1,277,085	1,277,085	7,156,171	8,016,455	8,741,948	9,656,196	13,523,595	13,406,841
Year 17	11,016,314	10,732,645	1,277,085	8,341,722	1,277,085	1,277,085	7,156,171	8,016,455	8,398,116	9,646,083	14,363,574	14,271,772
Year 18	11,014,639	10,707,279	1,276,891	8,317,682	1,276,891	1,276,891	17,345	17,345	1,797,224	3,063,585	14,372,090	14,280,656
Year 19	11,016,314	10,603,739	1,277,085	8,222,432	1,277,085	1,277,085	0	0	1,773,466	1,773,466	14,373,745	14,255,769
Year 20	11,016,314	10,672,405	1,277,085	8,287,061	1,277,085	1,277,085	0	0	1,778,649	1,778,649	14,373,745	14,276,889
Year 21	11,016,314	10,734,288	1,276,891	8,345,343	1,276,891	1,276,891	0	0	1,788,089	1,788,089	14,373,745	14,315,364
Year 22	11,014,639	10,703,013	1,276,891	8,315,757	1,276,891	1,276,891	0	0	1,788,772	1,788,772	14,372,090	14,316,869
Year 23	11,016,314	10,740,675	1,277,085	8,352,350	1,277,085	1,277,085	0	0	1,777,198	1,777,198	14,373,745	14,270,985
Year 24	11,016,314	10,704,133	1,277,085	8,318,756	1,277,085	1,277,085	0	0	1,773,946	1,773,946	14,373,745	14,257,727
Year 25	11,016,314	10,625,244	1,277,085	8,245,632	1,277,085	1,277,085	0	0	1,774,401	1,774,401	14,373,745	14,259,583
Year 26	11,014,639	10,509,088	1,276,891	8,136,639	1,276,891	1,276,891	0	0	1,775,906	1,775,906	14,372,090	14,264,474
Year 27	11,016,314	10,523,262	1,277,085	8,151,463	1,277,085	1,277,085	0	0	1,777,622	1,777,622	14,373,745	14,272,703
Year 28	11,016,314	10,517,159	1,277,085	8,146,297	1,277,085	1,277,085	0	0	1,777,622	1,777,622	14,373,745	14,275,259
Year 29	11,016,314	10,508,973	1,277,085	8,139,181	1,277,085	1,277,085	0	0	1,777,622	1,777,622	14,373,745	14,281,653
Year 30	26,704	854,566	3,771,452	3,771,452	1,276,891	1,276,891	0	0	1,777,622	1,777,622	14,372,090	14,351,463
Year 31	0	0	3,780,164	3,780,164	1,277,085	1,277,085	0	0	0	0	14,005,414	14,005,414
Year 32	0	0	3,798,825	3,798,825	1,277,085	1,277,085	0	0	0	0	14,005,414	14,005,414
Year 33	0	0	3,817,484	3,817,484	1,277,085	1,277,085	0	0	0	0	14,005,414	14,005,414
Year 34	0	0	3,835,613	3,835,613	1,276,891	1,276,891	0	0	0	0	14,003,760	14,003,760
Year 35	0	0	3,854,860	3,854,860	1,277,085	1,277,085	0	0	0	0	14,005,414	14,005,414
Year 36	0	0	3,873,520	3,873,520	1,277,085	1,277,085	0	0	0	0	14,005,414	14,005,414
Year 37	0	0	3,892,178	3,892,178	1,277,085	1,277,085	0	0	0	0	14,005,414	14,005,414
Year 38	0	0	3,910,297	3,910,297	1,276,891	1,276,891	0	0	0	0	14,003,760	14,003,760
Year 39	0	0	3,424,967	3,424,967	789,072	789,072	0	0	0	0	14,005,414	14,005,414
Year 40	0	0	2,837,190	2,837,190	416,838	416,838	0	0	0	0	14,005,414	14,005,414
Year 41	0	0	2,493,674	2,493,674	416,838	416,838	0	0	0	0	14,005,414	14,005,414
Year 42	0	0	0	0	0	0	0	0	0	0	0	0

**Appendix C - Monthly Water Balance Results for Pits and Pit Lake throughout Life of Mine and Pit Filling Phase**

Mine Life Year	Total Pit Inflow (MZ+EZ)	Total Pit Dewatering	Pit Infilling Rate		Pit Lake Volume	Main Zone Pit Lake Surface Elevation	East Zone Pit Lake Surface Elevation	Pit Lake Surface Area
	m <sup>3</sup> /year	m <sup>3</sup> /year	Tailings (m <sup>3</sup> /year)	Precip + GW during Closure (m <sup>3</sup> /year)				
Year 3	3,035,237	3,035,237	0	0	0	0	0	0.0
Year 2	7,075,510	6,947,086	0	0	0	0	0	0.0
Year 1	8,264,724	8,131,708	0	0	0	0	0	0.0
Year 1	8,519,368	8,488,664	0	0	0	0	0	0.0
Year 2	8,575,102	8,486,004	0	0	0	0	0	0.0
Year 3	8,827,098	8,732,438	0	0	0	0	0	0.0
Year 4	8,969,414	8,860,814	0	0	0	0	0	0.0
Year 5	9,667,324	9,447,036	0	0	0	0	0	0.0
Year 6	9,819,006	9,715,540	0	0	0	0	0	0.0
Year 7	9,837,471	9,739,809	0	0	0	0	0	0.0
Year 8	9,837,471	9,736,083	0	0	0	0	0	0.0
Year 9	9,849,204	9,747,326	0	0	0	0	0	0.0
Year 10	10,026,710	9,900,676	0	0	0	0	0	0.0
Year 11	10,164,100	10,047,252	0	0	0	0	0	0.0
Year 12	10,164,100	10,050,032	0	0	0	0	0	0.0
Year 13	10,214,967	10,075,733	0	0	0	0	0	0.0
Year 14	10,745,188	10,617,382	0	0	0	0	0	0.0
Year 15	13,406,022	13,262,672	0	0	0	0	0	0.0
Year 16	13,523,595	13,406,841	0	0	0	0	0	0.0
Year 17	14,363,574	14,271,772	0	0	0	0	0	0.0
Year 18	14,372,090	14,280,656	28,965,000	9,072,256	35,300,000	-227	0	0.3
Year 19	14,373,745	14,255,769	32,397,000	9,073,636	76,640,000	-155	0	0.6
Year 20	14,373,745	14,276,889	32,393,000	9,073,636	117,900,000	-105	0	0.9
Year 21	14,373,745	14,315,364	32,348,000	9,073,636	159,100,000	-66	0	1.1
Year 22	14,372,090	14,316,869	32,297,000	9,072,256	200,300,000	-33	0	1.3
Year 23	14,373,745	14,270,985	32,328,000	9,073,636	241,400,000	-5	0	1.5
Year 24	14,373,745	14,257,727	32,331,000	9,073,636	282,400,000	21	0	1.6
Year 25	14,373,745	14,259,583	32,347,000	9,073,636	323,400,000	44	0	1.8
Year 26	14,372,090	14,264,474	32,465,000	9,072,256	364,600,000	65	0	2.0
Year 27	14,373,745	14,272,703	32,568,000	9,073,636	405,700,000	85	0	2.1
Year 28	14,373,745	14,275,259	32,574,000	9,073,636	446,800,000	104	0	2.2
Year 29	14,373,745	14,281,653	32,558,000	9,073,636	487,900,000	120	-254	2.3
Year 30	14,372,090	14,351,463	32,379,000	9,072,256	528,900,000	120	-221	2.7
Year 31	14,005,414	14,005,414	32,208,000	12,195,391	572,400,000	120	-163	3.1
Year 32	14,005,414	14,005,414	19,314,130	12,170,365	605,400,000	120	-131	3.3
Year 33	14,005,414	14,005,414	30,764,000	12,150,312	645,500,000	120	-98	3.5
Year 34	14,003,760	14,003,760	33,024,000	12,123,594	690,000,000	120	-66	3.7
Year 35	14,005,414	14,005,414	33,024,000	12,100,698	734,400,000	120	-39	3.9
Year 36	14,005,414	14,005,414	33,024,000	12,077,452	778,700,000	120	-14	4.1
Year 37	14,005,414	14,005,414	33,024,000	12,055,008	823,000,000	120	9	4.3
Year 38	14,003,760	14,003,760	33,024,000	12,031,962	867,400,000	120	30	4.4
Year 39	14,005,414	14,005,414	33,024,000	12,012,271	911,600,000	120	49	4.6

←←← TAILINGS DEPOSITION STARTS IN MZ PIT

←←← MZ PIT FILLED UP TO SADDLE ELEVATION. TAILINGS DEPOSITION SWITCHES TO EZ

**Appendix C - Monthly Water Balance Results for Pits and Pit Lake throughout Life of Mine and Pit Filling Phase**

Mine Life Year	Total Pit Inflow (MZ+EZ)	Total Pit Dewatering	Pit Infilling Rate		Pit Lake Volume	Main Zone Pit Lake Surface Elevation	East Zone Pit Lake Surface Elevation	Pit Lake Surface Area
	m <sup>3</sup> /year	m <sup>3</sup> /year	Tailings (m <sup>3</sup> /year)	Precip + GW during Closure (m <sup>3</sup> /year)		m RL	m RL	
Year 40	14,005,414	14,005,414	33,024,000	11,995,104	955,800,000	120	67	4.7
Year 41	14,005,414	14,005,414	19,058,196	11,988,359	988,300,000	120	80	4.8
Year 42	14,003,760	14,003,914	203,080	11,984,173	1,000,000,000	120	85	4.9
Year 43	14,005,414	0	0	11,983,913	1,011,000,000	120	89	4.9
Year 44	14,005,414	0	0	11,982,262	1,023,000,000	120	93	4.9
Year 45	14,005,414	0	0	11,980,634	1,034,000,000	120	97	5.0
Year 46	14,003,760	0	0	11,977,645	1,045,000,000	120	101	5.0
Year 47	14,005,414	0	0	11,977,424	1,057,000,000	120	105	5.1
Year 48	14,005,414	0	0	11,975,839	1,068,000,000	120	109	5.1
Year 49	14,005,414	0	0	11,974,269	1,079,000,000	120	113	5.1
Year 50	14,003,760	0	0	11,971,333	1,090,000,000	120	117	5.1
Year 51	14,005,414	0	0	11,971,181	1,100,000,000	120	120	10.3
Year 52	14,005,414	0	0	11,969,777	1,111,000,000	122	122	5.3
Year 53	14,005,414	0	0	11,968,432	1,122,000,000	124	124	5.3
Year 54	14,003,760	0	0	11,965,713	1,133,000,000	126	126	5.4
Year 55	14,005,414	0	0	11,965,754	1,143,000,000	128	128	5.5
Year 56	14,005,414	0	0	11,964,426	1,154,000,000	130	130	5.6
Year 57	14,005,414	0	0	11,963,094	1,165,000,000	132	132	5.7
Year 58	14,003,760	0	0	11,960,392	1,175,000,000	133	133	5.8
Year 59	14,005,414	0	0	11,960,453	1,186,000,000	135	135	5.8
Year 60	14,005,414	0	0	11,958,422	1,196,000,000	137	137	5.9
Year 61	14,005,414	0	0	11,952,911	1,207,000,000	139	139	5.9
Year 62	14,003,760	0	0	11,945,114	1,217,000,000	140	140	5.9
Year 63	14,005,414	0	0	11,940,085	1,228,000,000	142	142	5.9
Year 64	14,005,414	0	0	11,933,685	1,238,000,000	144	144	5.9
Year 65	14,005,414	0	0	11,927,292	1,249,000,000	146	146	5.9
Year 66	14,003,760	0	0	11,919,524	1,259,000,000	147	147	6.0
Year 67	14,005,414	0	0	11,914,522	1,269,000,000	149	149	6.0
Year 68	14,005,414	0	0	11,908,180	1,280,000,000	151	151	6.0
Year 69	14,005,414	0	0	11,901,970	1,290,000,000	153	153	6.0
Year 70	14,003,760	0	0	11,894,416	1,301,000,000	154	154	6.0
Year 71	14,005,414	0	0	11,889,633	1,311,000,000	156	156	6.0
Year 72	14,005,414	0	0	11,883,479	1,321,000,000	158	158	6.1
Year 73	14,005,414	0	0	11,877,332	1,332,000,000	159	159	6.1
Year 74	14,003,760	0	0	11,869,811	1,342,000,000	161	161	6.1
Year 75	14,005,414	0	0	11,865,060	1,352,000,000	163	163	6.1
Year 76	14,005,414	0	0	11,858,938	1,363,000,000	164	164	6.1
Year 77	14,005,414	0	0	11,852,845	1,373,000,000	166	166	6.2
Year 78	14,003,760	0	0	11,845,467	1,383,000,000	168	168	6.2
Year 79	14,005,414	0	0	11,840,873	1,394,000,000	169	169	6.2
Year 80	14,005,414	0	0	11,834,905	1,404,000,000	171	171	6.2
Year 81	14,005,414	0	0	11,828,948	1,414,000,000	173	173	6.2
Year 82	14,003,760	0	0	11,821,612	1,424,000,000	174	174	6.2

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Appendix C - Monthly Water Balance Results for Pits and Pit Lake throughout Life of Mine and Pit Filling Phase

Mine Life Year	Total Pit Inflow (Mz+EZ)	Total Pit Dewatering	Pit Infilling Rate		Pit Lake Volume	Main Zone Pit Lake Surface Elevation	East Zone Pit Lake Surface Elevation	Pit Lake Surface Area
	m <sup>3</sup> /year	m <sup>3</sup> /year	Tailings (m <sup>3</sup> /year)	Precip + GW during Closure (m <sup>3</sup> /year)		m RL	m RL	
Year 83	14,005,414	0	0	11,817,044	1,435,000,000	176	176	6.3
Year 84	14,005,414	0	0	11,811,105	1,445,000,000	177	177	6.3
Year 85	14,005,414	0	0	11,805,168	1,455,000,000	179	179	6.3
Year 86	14,003,760	0	0	11,797,871	1,465,000,000	181	181	6.3
Year 87	14,005,414	0	0	11,793,436	1,475,000,000	182	182	6.3
Year 88	14,005,414	0	0	11,787,667	1,486,000,000	184	184	6.4
Year 89	14,005,414	0	0	11,781,905	1,496,000,000	185	185	6.4
Year 90	14,003,760	0	0	11,772,593	1,506,000,000	187	187	6.4
Year 91	14,005,414	0	0	11,758,256	1,516,000,000	189	189	6.4
Year 92	14,005,414	0	0	11,741,138	1,526,000,000	190	190	6.5
Year 93	14,005,414	0	0	11,724,076	1,536,000,000	192	192	6.5
Year 94	14,003,760	0	0	11,705,656	1,546,000,000	193	193	6.5
Year 95	14,005,414	0	0	11,690,039	1,556,000,000	195	195	6.5
Year 96	14,005,414	0	0	11,673,169	1,566,000,000	196	196	6.5
Year 97	14,005,414	0	0	11,656,515	1,576,000,000	198	198	6.5
Year 98	14,003,760	0	0	11,638,523	1,586,000,000	199	199	6.5
Year 99	0	0	0	11,623,336	1,596,000,000	201	201	6.6
Year 100	0	0	0	11,606,813	1,606,000,000	202	202	6.6
Year 101	0	0	0	11,590,334	1,616,000,000	204	204	6.6
Year 102	0	0	0	11,572,551	1,626,000,000	205	205	6.6
Year 103	0	0	0	11,557,580	1,636,000,000	207	207	6.6
Year 104	0	0	0	11,541,261	1,646,000,000	208	208	6.6
Year 105	0	0	0	11,524,970	1,655,000,000	210	210	6.6
Year 106	0	0	0	11,507,701	1,665,000,000	211	211	6.7
Year 107	0	0	0	11,493,963	1,675,000,000	213	213	6.8
Year 108	0	0	0	11,478,953	1,685,000,000	214	214	6.9
Year 109	0	0	0	11,464,010	1,694,000,000	215	215	6.9
Year 110	0	0	0	11,447,742	1,704,000,000	217	217	7.0
Year 111	0	0	0	11,434,306	1,714,000,000	218	218	7.1
Year 112	0	0	0	11,419,609	1,723,000,000	219	219	7.1
Year 113	0	0	0	11,405,021	1,733,000,000	221	221	7.1
Year 114	0	0	0	11,389,072	1,742,000,000	222	222	7.1
Year 115	0	0	0	11,375,921	1,752,000,000	223	223	7.2
Year 116	0	0	0	11,361,418	1,761,000,000	225	225	7.2
Year 117	0	0	0	11,347,090	1,771,000,000	226	226	7.2
Year 118	0	0	0	11,331,801	1,780,000,000	227	227	7.2
Year 119	0	0	0	11,319,377	1,789,000,000	228	228	7.3
Year 120	0	0	0	11,305,615	1,799,000,000	230	230	7.3
Year 121	0	0	0	11,291,898	1,808,000,000	231	231	7.4
Year 122	0	0	0	11,276,834	1,818,000,000	232	232	7.4
Year 123	0	0	0	11,264,593	1,827,000,000	233	233	7.5
Year 124	0	0	0	11,251,197	1,836,000,000	235	235	7.5
Year 125	0	0	0	11,237,911	1,845,000,000	236	236	7.5

**Appendix C - Monthly Water Balance Results for Pits and Pit Lake throughout Life of Mine and Pit Filling Phase**

Mine Life Year	Total Pit Inflow (MZ+EZ)		Total Pit Dewatering		Pit Infilling Rate			Pit Lake Volume	Main Zone Pit Lake Surface Elevation	East Zone Pit Lake Surface Elevation	Pit Lake Surface Area
	m <sup>3</sup> /year	m <sup>3</sup> /year	m <sup>3</sup> /year	m <sup>3</sup> /year	Tailings (m <sup>3</sup> /year)	Precip + GW during Closure (m <sup>3</sup> /year)	m <sup>3</sup>				
Year 126	0	0	0	0	0	11,209,499	1,855,000,000	237	237	237	7.6
Year 127	0	0	0	0	0	11,158,202	1,864,000,000	238	238	238	7.6
Year 128	0	0	0	0	0	11,104,428	1,873,000,000	239	239	239	7.6
Year 129	0	0	0	0	0	11,051,498	1,882,000,000	241	241	241	7.7
Year 130	0	0	0	0	0	10,999,861	1,891,000,000	242	242	242	7.7
Year 131	0	0	0	0	0	10,952,040	1,900,000,000	243	243	243	7.8
Year 132	0	0	0	0	0	10,903,237	1,908,000,000	244	244	244	7.9
Year 133	0	0	0	0	0	10,854,828	1,917,000,000	245	245	245	8.0
Year 134	0	0	0	0	0	10,805,408	1,926,000,000	246	246	246	8.0
Year 135	0	0	0	0	0	10,759,153	1,934,000,000	247	247	247	8.1
Year 136	0	0	0	0	0	10,711,908	1,943,000,000	248	248	248	8.2
Year 137	0	0	0	0	0	10,665,677	1,951,000,000	249	249	249	8.2
Year 138	0	0	0	0	0	10,619,032	1,960,000,000	250	250	250	8.2
Year 139	0	0	0	0	0	10,575,465	1,968,000,000	251	251	251	8.3
Year 140	0	0	0	0	0	10,530,824	1,976,000,000	252	252	252	8.3
Year 141	0	0	0	0	0	10,486,488	1,985,000,000	253	253	253	8.3
Year 142	0	0	0	0	0	10,441,053	1,993,000,000	254	254	254	8.4
Year 143	0	0	0	0	0	10,398,688	2,001,000,000	255	255	255	8.4
Year 144	0	0	0	0	0	10,356,477	2,009,000,000	256	256	256	8.5
Year 145	0	0	0	0	0	10,316,306	2,017,000,000	257	257	257	8.5
Year 146	0	0	0	0	0	10,275,063	2,025,000,000	258	258	258	8.6
Year 147	0	0	0	0	0	10,236,901	2,033,000,000	259	259	259	8.7
Year 148	0	0	0	0	0	10,197,671	2,041,000,000	259	259	259	8.7
Year 149	0	0	0	0	0	10,158,743	2,048,000,000	260	260	260	8.8
Year 150	0	0	0	0	0	10,118,727	2,056,000,000	261	261	261	8.9
Year 151	0	0	0	0	0	10,081,777	2,064,000,000	262	262	262	8.9
Year 152	0	0	0	0	0	10,043,751	2,071,000,000	263	263	263	9.0
Year 153	0	0	0	0	0	10,006,084	2,079,000,000	264	264	264	9.0
Year 154	0	0	0	0	0	9,967,439	2,086,000,000	264	264	264	9.0
Year 155	0	0	0	0	0	9,931,783	2,094,000,000	265	265	265	9.0
Year 156	0	0	0	0	0	9,894,946	2,101,000,000	266	266	266	9.0
Year 157	0	0	0	0	0	9,858,302	2,109,000,000	267	267	267	9.0
Year 158	0	0	0	0	0	9,820,466	2,116,000,000	268	268	268	9.0
Year 159											

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