Minto Mine
Phase V/VI Water Management Plan
July 2013

Prepared by:
Minto Explorations Ltd.
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1 Introduction

Minto Explorations Ltd. (Minto), a wholly owned subsidiary of Capstone Mining Corp. (Capstone), owns and operates the Minto Mine, a high-grade copper mine located within Selkirk First Nation (SFN) Category A Settlement Land Parcel R-6A, approximately 240 km northwest of Whitehorse, Yukon Territory.

This report describes the Water Management Plan that was developed in conjunction with the waste rock management plan and the tailings management plan for the Phase V/VI expansion of the Minto Mine operations, as described in Minto Explorations Ltd. Project Proposal: Phase V/VI Expansion of Mining and Milling. The Phase V/VI expansion includes the following activities:

- Mining of Phase V/VI pits (Area 2 Stage 3, Minto North, Ridgetop North, and Ridgetop South) using conventional surface mining methods, including an expanded network of haul roads (2.3 km of new roads) to accommodate the mining activities;
- Open pit mining at a rate of 12,800 BCM/day, followed by a decrease to 7,200 BCM/day after the completion of Area 2 Stage 3;
- Mining of a new East Keel Underground, with its own separate decline and surface infrastructure, from a portal located near the Main Pit highwall;
- Mining of a new Wildfire Underground, which will be accessed through its own separate decline and possess its own surface infrastructure separate from that developed for the Minto South Underground;
- An increase in open pit mine life to Q2-2017, underground mine life to Q4-2019, and milling of stockpiled ore to Q2-2022;
- New management practices for waste rock and overburden mined from the Phase V/VI pits; specifically, cessation of waste rock segregation on the basis of copper grade and adoption of material dispatching based on on-site assessments of acid-generating potential;
- Creation of a new waste rock dump (Main Pit Dump) within the footprint of the mined-out Main Pit;
- Continued placement of waste rock on the existing Main Waste Dump, including an expansion beyond its currently permitted design footprint and capacity;
- Backfilling of the completed Area 118 and Ridgetop South pits with overburden, and the further stacking of overburden on the footprints of these pits;
- Creation of a new waste rock dump (Ridgetop Dump) to the west of the Ridgetop North and South pits;
- The potential extension of the current Mill Valley Fill to further stabilize the dry stack tailings storage facility; and
- The expanded use of the Main Pit and Area 2 Pit – and the new use of the Ridgetop pits – as storage locations for slurry tailings from milling.
- Construction of a small dam to retain tailings within the footprint of the Main Pit.

This document describes the following aspects of water management at the Minto Mine:

- The site water balance (Section 2);
- Phase V/VI operational water management, including water balance modeling results and discharge management (Section 3);
- Phase V/VI water management infrastructure changes (Section 4);
- Transition to closure (Section 5); and
- Summary (Section 6).

The water management approach at the Minto Mine is to limit and manage the inventory of mine water stored on site by segregating clean runoff and mine water. Clean runoff is to be diverted to Minto Creek while mine water is to be used for milling of ore and sub-aqueous deposition of tailings and waste rock.

2 Phase V/VI Water Balance

2.1 Water Management Strategy

The water management strategy proposed for Minto Phase V/VI is intended to limit and manage the inventory of mine water stored on site in a way that minimizes potential effects to Minto Creek.

The strategy for managing the mine water inventory can be summarized as follows:

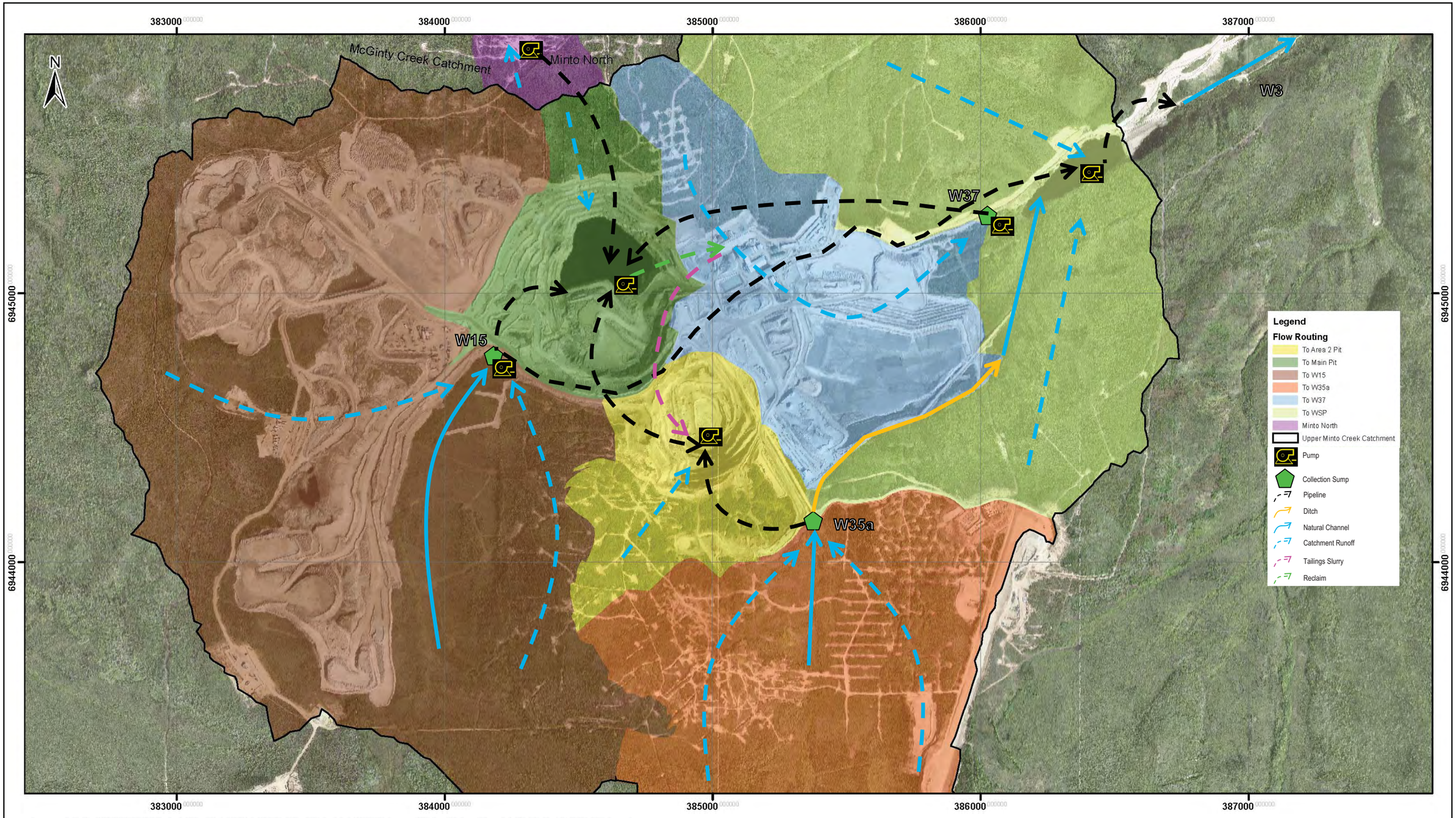
- Discharge-compliant (clean) runoff will be collected and diverted to the water storage pond (WSP) and from there to Minto Creek. The release of clean runoff is expected to effectively control the inventory of mine water on site.
- Runoff from developed mine areas (mine water) will be collected and stored in the Main Pit Tailings Management Facility (MPTMF) and the Area 2 Pit Tailings Management Facility (A2PTMF). Mine water will be used for ore processing and deposition of tailings and waste rock.
- Water diversion and conveyance infrastructure will be upgraded to ensure efficient segregation of runoff from undisturbed and developed catchments.
- Water inventory targets will be defined based on forecasts of water demand and runoff volumes. Regular tracking of the mine water inventory will allow operators to determine if the inventory is on target; or, if water must be withheld or released from site.

The following sections will describe elements of the water balance for the Minto Mine site and highlight the importance of the site water balance in the development of the water management strategy.

2.2 Catchments

Figure 2-1 shows a schematic of sub-catchments within the upper Minto Creek (Minto Mine site) catchment as well as the sub-catchment for the Minto North Pit, which is located within the adjacent McGinty Creek Catchment. Conveyance routes indicated on the figure is for the Phase V/VI operations period.

The Minto Mine Phase V/VI water balance includes the 7 sub-catchments listed in Table 2-1. The sub-catchments can be classified as undisturbed, developed, or partially developed. Undisturbed catchments typically produce clean runoff that is of similar quality as background water quality in lower Minto Creek. Developed catchments produce mine water runoff. The mine water runoff is generally of poorer quality than the clean runoff but the quality varies over a wide range depending on degree and type of development and season. Runoff from the undisturbed catchments WSP and W35a are the main targets for collection and diversion of clean water for Phase V/VI.



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CAPSTONE MINING CORP.
MINTO MINE
OPERATED BY MINTO EXPLORATIONS LTD.

Minto Mine

Minto Mine Phase V/VI Expansion: Water and Load Balance Model Report

Modelled Routing of Water: 2014

Date:	Approved:	Figure:
June 2013	SRJ	2-1

Table 2-1: Minto Mine Site Sub-Catchments.

Catchment	Area (ha)	Catchment	Description
Area 2 Pit	82	Developed	Includes the Area 2 Pit, Ridgetop North and Ridgetop South.
Main Pit	90	Developed	Includes Main Pit and northern upstream catchment
Minto North	14	Developed	Includes Minto North Pit and upstream catchment. The Minto North catchment is located within the McGinty Creek catchment.
W15	374	Partially developed /undisturbed	Includes the South-West Dump, Main Dump and the majority of the western undisturbed catchments.
W35a	172	Undisturbed	Includes the southern undisturbed catchment, laydown area and airstrip.
W37	79	Developed	Includes dry stack tailings facility, the plant site and the Mill Valley.
WSP	235	Undisturbed	Includes the undisturbed catchments south and north-west of the WSP.
Total	1046		

2.3 Precipitation and Runoff

Table 2-2 shows the estimated range of annual precipitation and site-wide runoff for the Minto Mine site. Assessments of the annual water balance for the site have concluded that the portion of precipitation that ultimately is collected as runoff is approximately 30% of the total annual precipitation. Thus, an estimated 70% of the annual precipitation is lost through evapotranspiration, sublimation and groundwater recharge. Additional water is lost by evaporation from open water stored in the open pits and water storage pond (WSP).

Table 2-2: Minto Mine Site Precipitation and Runoff Estimates.

		1:100 Dry Year	Average Annual Precipitation	1:200 Wet Year
Precipitation	mm	205	329	498
Estimated Site-Wide Runoff	m^3/year	450,000	850,000	1,400,000

2.4 Groundwater

Groundwater represents a relatively minor component of the site's water balance. The mine is located at the headwaters of Minto Creek and therefore has limited inputs of regional groundwater. The tight bedrock and discontinuous permafrost limit the sub-surface movement of ground water. Some groundwater is encountered during active mining of the pits; however, discharge volumes are relatively low. An evaluation of groundwater for the Minto Site is available in the Hydrogeological Characterization Report (SRK 2013).

2.5 Annual Operational Water Balance

Table 2-3 shows a summary of the annual operational water balance for Minto Phase V/VI. The operational water demand for Phase V/VI includes subaqueous deposition of tailings and NP:AP<3 waste rock[1]. The annual water balance shows that runoff yields approximately 240,000m^3 of water in excess of the operational demands in a year with average precipitation. This volume corresponds to approximately 28% of all surface runoff collected from the Minto Mine site catchment. This water can either be stored on site or be released to Minto Creek. In a 1 in 100 dry year, the runoff volume would not be sufficient to cover the operational water demand, while runoff in excess of the operational demand would amount to approximately 790,000m^3 in a 1 in 200 wet year. The strategy proposed for managing the excess surface runoff and mine water inventory for Phase V/VI is to divert and release clean runoff to Minto Creek to the greatest extent possible.

Table 2-3: Annual Operational Water Balance Summary for Minto Phase V/VI.

Water Balance Component	Unit	1:100 Dry Year	Average Annual Precipitation	1:200 Wet Year
Water Input				
Annual site-wide runoff	m^3/year	450,000	850,000	1,400,000
Operational Water Demand				
Water to tailings pores	m^3/year	550,000	550,000	550,000
Water to waste rock pores[A]	m^3/year	60,000	60,000	60,000
Water in Excess of Operational Demands				
Water to store on site or to Minto Creek	m^3/year	-160,000	240,000	790,000
Water to store on site or to Minto Creek	% of total runoff	-36%	28%	56%

Notes: [A]NP:AP<3 waste rock

2.6 Diversion of Clean Runoff

Table 2-4 shows a summary of sub-catchments for Minto Phase V/VI. Sub-catchments that can be considered to be undisturbed (i.e. consistently produce clean/discharge-compliant runoff) include the WSP and W35a catchments.

The WSP catchment accounts for approximately 22% of the total catchment area of the Minto Mine site. Runoff from the northeastern WSP catchment is collected in a ditch along the mine access road and flows through a culvert to the WSP. The eastern portion of the southern WSP catchment reports to the south diversion ditch that follows the southern boundary of the dry-stack tailings facility. From there, it is piped to the WSP. Runoff from westernmost portion of the southern catchment reports directly to the WSP.

The W35a catchments represent approximately 16% of the total catchment area of the Minto Mine site. For Phase V/VI of the Minto Mine development water collected at W35a will be conveyed to the south diversion ditch and from there flow to the WSP.

Combined, the WSP and W35a catchments account for about 38% of the total upper Minto Catchment area. The volume of runoff that can be diverted to the WSP depends on the collection and diversion efficiencies of the water management ditches, sumps, and pipes. Assuming that actual diversion efficiencies range between 60% and 80%, the average annual runoff volume that would be diverted to the WSP would range between 210,000 m^3 and 280,000 m^3, or between 25% and 33% of the total runoff from upper Minto Creek. Therefore, diverting runoff from these two catchments may be sufficient

[1] NP:AP<3 waste rock has a ratio of acid potential to neutralizing potential that is greater than 3 as determined by static (acid base accounting) tests. NP:AP<3 waste rock is sometimes referred to as potentially acid generating (PAG) waste rock.

for maintaining a net zero water balance for the Phase V/VI operation, assuming that the precipitation on site over the remaining mine life (8 years) is close to the average annual precipitation of 329 mm.

However, in order to reduce the current mine water inventory, or in the event that runoff volumes are greater than estimated, it may be advantageous or necessary to release additional water. If so, additional runoff may be diverted from W15 to the WSP (See Figure 2-1). W15 receives runoff from both undisturbed catchments and developed mine areas. However, runoff that historically has reported to W15 has generally met water quality limits listed in Water Use License QZ96-006 for the months of May, June, July, and August. The W15 catchment represents 36% of the total upper Minto Creek catchment and could yield another 150,000 m^3 to 200,000 m^3 of relatively clean runoff. Therefore, with diversion in place for the WSP, W35a and W15 sub-catchments, a total volume of 360,000 m^3 to 480,000 m^3 may be collected and released annually from the Minto Site.

Table 2-4: Minto Phase V/VI: Sub-Catchments and Potential Runoff Volumes Diverted, Average Year.

Sub-Catchment	Area	% of Minto Mine Site-Wide Catchment	Diverted Clean Runoff, 60% Diversion Efficiency		Diverted Clean Runoff, 80% Diversion Efficiency	
	ha	%	m^3/year	% of Site-Wide Runoff	m^3/year	% of Site-Wide Runoff
W35a	172	16%	120,000	14%	160,000	19%
WSP	235	22%	90,000	11%	120,000	14%
W15	374	36%	150,000	18%	200,000	24%
Diversion Options						
W35a + WSP	407	39%	210,000	25%	280,000	33%
W35a + WSP + W15	781	75%	360,000	42%	480,000	56%

If clean surface runoff does not meet the Phase V/VI water quality limits then water treatment may be required. Operational use of water treatment is discussed in Section 3.4 (Water Inventory and Discharge Management).

3 Phase V/VI Operational Water Management Plan

This section outlines the operational water management plan for Phase V/VI of the Minto Mine development. Section 3.1 provides an overview of the water management for Minto Phase V/VI, including mine water inventory and reservoirs.

A water and load balance model developed for the Minto Site was used to develop and refine the water balance and management strategy as well as to evaluate potential risks. Section **Error! Reference source not found.** summarizes the model scenarios, results and the relevance of the results for the Phase V/VI water management strategy.

Section 3.4 provides details of the discharge management plan, which describes specific water management decision points and actions.

3.1 Overview of Water Management Plan

3.1.1 Operating Principle

The primary objective of the Phase V/VI water management plan is to manage the inventory of mine water stored on the site. The mine operation must have sufficient water to operate but an excess of mine water that cannot be released to Minto Creek without treatment is a potential operational and environmental liability.

During Phase V/VI, water collected at the Minto Mine will be segregated on the basis of clean runoff and mine water. Clean runoff will be diverted around the active mining areas to the water storage pond, and mine water will be contained in the MPTMF and A2PTMF. Runoff is classified as 'clean' if the water meets the water quality limits defined in the applicable water use licence. Runoff that does not meet water quality limits is categorized as 'mine water'. For Phase V/VI clean runoff is intended to be released to Minto Creek from the WSP while mine water will be used for processing of ore and for sub-aqueous deposition of tailings and waste rock.

Diversion and release of clean runoff is intended to be the main method for managing the mine water inventory. However, release of treated mine water may be required in the event diversion of clean water is insufficient for managing the inventory of mine water.

Figure 3-1 shows a diagram of the work flow for the proposed water management plan. The work flow includes the following steps:

Step 1. Define a mine water inventory target. The target will be set based on the available storage capacity, operational water demand, and runoff estimates. The water and load balance model will be used as a tool to evaluate the potential range of precipitation and runoff events that will have to be planned for.

Step 2. Track the site's mine water inventory. The inventory of mine water stored in the MPTMF and A2PTMF will be tracked on a weekly or monthly basis or as required, by surveying the water levels in the two reservoirs and by tracking the volume of waste rock and tailings solids deposited sub-aqueously in the two tailings management facilities. If the mine water inventory is increasing at a rate that would result in an exceedance of the inventory target, then steps would be taken to release additional water from site. Discharge management is described in Section 3.3.

Step 3. Update the water inventory target every 6 months, or as required and repeat Step 2. Operational, physical or water quality changes may change the water demand, storage requirement, availability of reservoirs or other elements that was used as a basis for defining the water inventory target. Therefore, it is important that the inventory target is updated regularly.

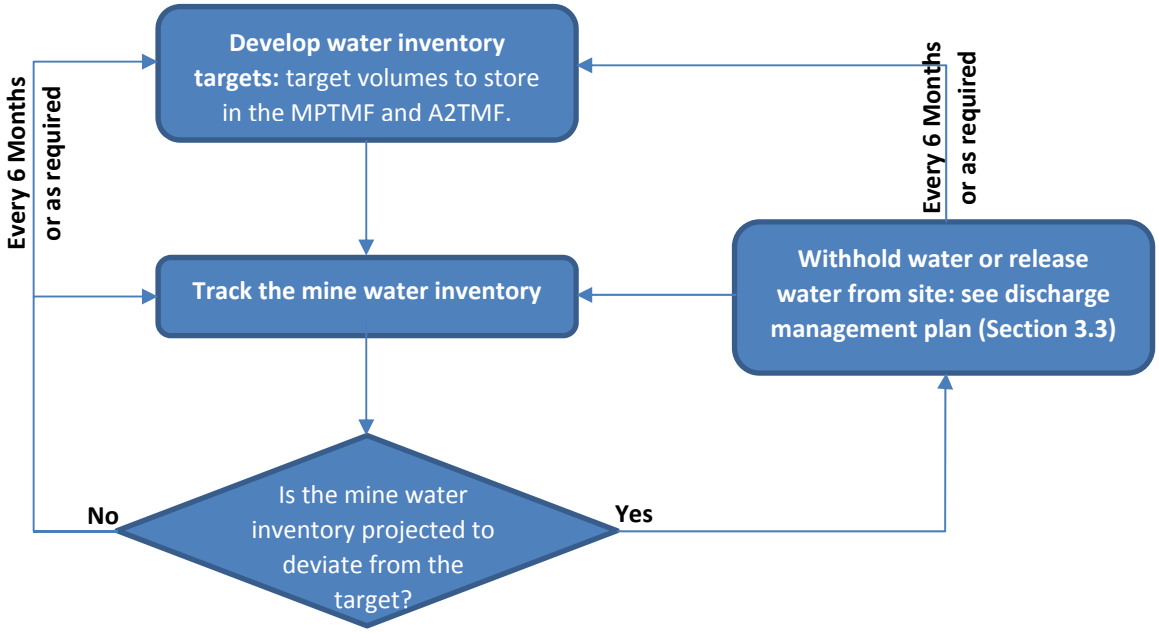


Figure 3-1: Water Management Plan Workflow.

3.1.2 Defining Mine Water Inventory Target

The mine water inventory target will be defined based on the following considerations:

- As a guiding principle, a minimum of 600,000 m^3 of free water, or one year of operational water demand, should be stored on site at all times. This water inventory will ensure that the operation has adequate supply of water and that the mine water reservoir has sufficient residence time to allow for proper settling and management of suspended solids.
- Storage capacity to hold a minimum of 850,000 m^3 of mine water runoff must be available on March 30 each year. This storage capacity is estimated to represent an average annual site-wide runoff.
- Long-term inventory projections. Currently, approximately 1.6 Mm^3 of free mine water is stored on the mine site. At closure, the goal is for there to be less than 1.0 Mm^3 of free mine water stored on site. Potential implications of a large mine water inventory on site at closure are discussed in Section 5.
- Climatic variability. The water and load balance model developed for the Minto site will be used to evaluate the mine water inventory targets against a range of precipitation and runoff events (dry and wet years).

The inventory targets will be used by water operators as a basis for deciding whether to release additional water from site or to scale back water release. Inventory targets will be updated every 6 months or as required.

3.1.3 Mine Water Inventory Tracking

Water operators at the Minto Mine will track the mine water inventory on a weekly or monthly basis or as required. The following data will be collected and used for inventory tracking:

- Surveys of water levels in:
    - The Main Pit Tailings Management Facility (MPTMF)
    - The Area 2 Pit Tailings Management Facility (A2PTMF), and
    - The Water Storage Pond (WSP)
- Volumes of tailings solids and waste rock deposited sub-aqueously in the MPTMF and A2PTMF
- Pumped flows on site
- Precipitation and snow accumulation
- Runoff at hydrometric stations

Surveyed water levels will be converted to volumes using level-volume curves for the MPTMF and A2PTMF (Appendix B). The frequency of updates to the water inventory will depend on the season and operational factors. During winter months when flows are low, inventory updates may only be required every 4–8 weeks. However, before freshet and during periods with heavy precipitation events over the summer and fall months, it may be necessary to update the inventory every 1–3 weeks.

3.2 Reservoirs

The water management plan was developed in conjunction with the waste rock management plan and the tailings management plan (Minto 2013b, 2013c). The tailings management plan (TMP) was developed to make use of three tailings management facilities planned for Phase V/VI, namely the MPTMF, A2PTMF and the Ridgetop North Pit TMF (RNPTMF). The water management plan will primarily rely on the water storage capacity available in the MPTMF and the A2PTMF.

3.2.1 Main Pit Tailings Management Facility

The total storage capacity of Main Pit to its natural spill elevation is approximately 4.9 Mm^3. As part of Phase V/VI, Minto intends to construct a dam across the low point of the east wall of Main Pit to increase the storage capacity of MPTMF to roughly 6.9 Mm^3. This will provide the storage capacity required for Phase V/VI. Additional details concerning the proposed MPTMF are available in the TMP.

Deposition of tailings and management of water in the Main Pit is expected to roughly follow the sequence outlined below. However, various operational constraints may necessitate deviations from the proposed schedule.

Tailings deposition to the Main Pit would continue through the transition of Phase IV to Phase V/VI in the first or second quarter of 2014. Over that period, the total volume of bulk solids (tailings/waste rock solids + pore water) and free water stored in the pit are expected to increase from approximately 2.2 Mm^3 to 3.3 Mm^3. The Main Pit would serve as a reservoir for mine and reclaim water throughout this period.

In the first or second quarter of 2014 tailings deposition would be directed to the Area 2, Stage 2 pit for a period of 12– 16 months. During this time, the Main Pit would continue to serve as a reservoir for mine and reclaim water, which is expected to result in a net reduction of the water volume stored in the pit. Tailings deposition to the Main Pit would resume sometime in 2015 and would likely continue until 2018. However, from the end of 2017 until closure in 2022, reclaim water will be sourced from the Area 2 Pit.

3.2.2 Area 2 Pit Tailings Management Facility

The final A2PTMF will consist of two intersecting pits separated by a saddle (Figure 3-2 and Figure 3-3). The larger and more northerly of the intersecting pits is a Phase IV development called Area 2 Stage 2 Pit, while the smaller and more southerly pit will be a Phase V/VI development referred to as Area 2 Stage 3 Pit. The total storage capacity of the final A2PTMF below the natural spill elevation of 802 m will be approximately 7.9 Mm^3.

During development and mining of the Area 2 Stage 2 Pit, the mine water collected will be pumped to the MPTMF as part of the Phase IV operations. When mining of the Stage 2 area has been completed in the first or second quarter of 2014, tailings and NP:AP<3 waste rock will be deposited in the Stage 2 area. At this time, some mine water may be allowed to accumulate the in Stage 2 area. However, excess water will continue to be pumped to the MPTMF. Deposition of tailings to the Area 2 Stage 2 Pit would continue until the storage capacity has been nearly completed – a period of 12–16 months.

Prior to completion of Area 2 Stage 3 Pit, storage of tailings and water in Stage 2 Pit is limited to that volume below the saddle elevation of 760 m (roughly 2.1 Mm^3 - see Figure 3-4). After the Stage 3 Pit is complete, the entire volume of the combined Area 2 Stage 2 and Stage 3 pits will be available for storage (Figure 3-4).

Mining of the Area 2 Stage 3 pit is expected to be completed in the first or second quarter of 2016. Prior to the completion of mining, mine water collected in the pit would be pumped to the MPTMF. After completion of mining, the entire Area 2 Pit (now the A2PTMF) would be used as a mine water reservoir and for deposition of tailings and NP:AP<3 waste rock. Local mine water runoff would be allowed to accumulate and any excess mine water from the Main Pit would be conveyed to the A2PTMF. In 2017, the reclaim barge would be relocated to the A2PTMF pit to allow for complete infilling of the MPTMF with tailings.

The storage curve for A2S2 Pit below the saddle elevation of 760 m and the storage curve for A2S3 Pit are shown in Appendix A to this document.

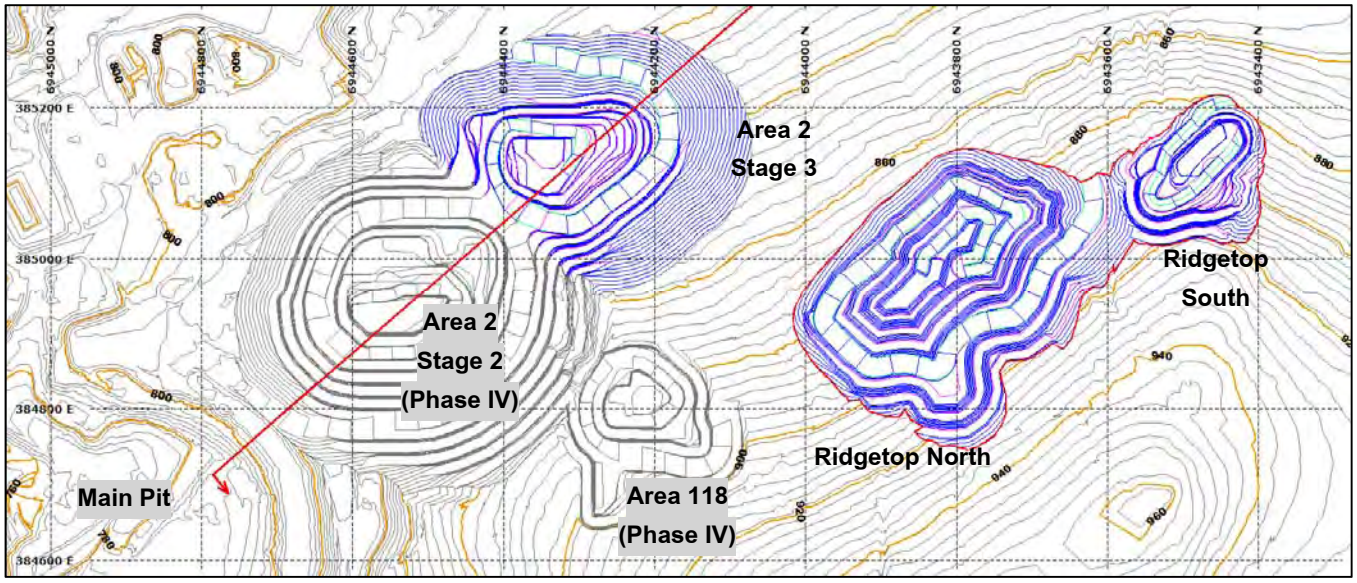


Figure 3-2: Overview of Phase V Pits (Excluding Minto North) Showing Section Line for Figure 3-3 and Figure 3-4.

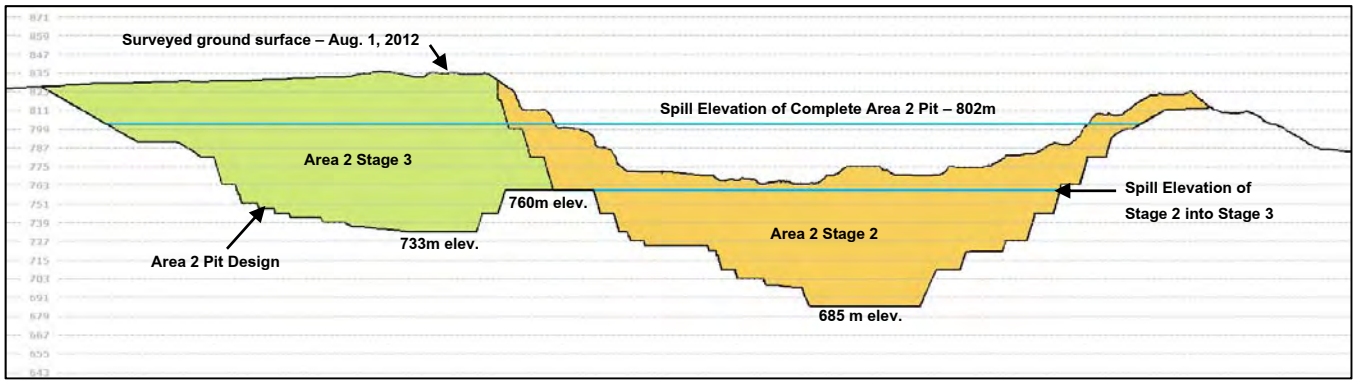


Figure 3-3: Section through Area 2 Pit Showing Staging and Spill Elevations.

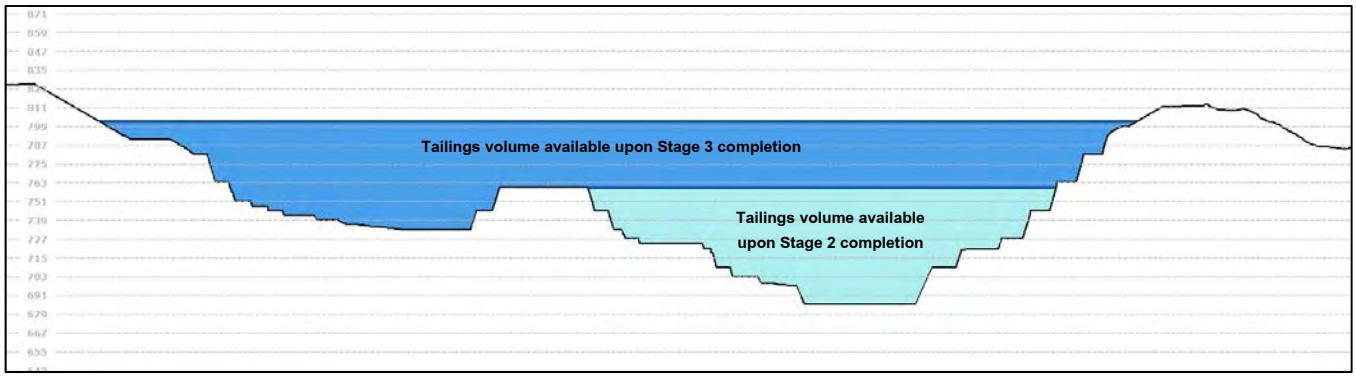


Figure 3-4: Section Through Area 2 Pit Showing Tailings Volume Made Available with Staged Mining of Area 2.

3.2.3 Ridgetop North Pit TMF

Ridgetop North Pit (Figure 3-2) is expected to be the final open pit mined as part of Phase V/VI, with mining scheduled to be completed during Q3 2017. Ridgetop North Pit TMF is projected to have a total storage volume of 1.9 Mm^3 below the natural spill elevation of 862 m. The storage curve for TMF is shown in Appendix B.

The Ridgetop North Pit TMF will only receive tailings slurry; no NP:AP<3 rock will be stored in this facility. During Phase V/VI operations, Minto anticipates pumping excess water from the Ridgetop North Pit TMF to the adjacent A2PTMF for purposes of water management. There will be no surface discharge from the TMF and no spillway.

3.2.4 Minto North

During active development and mining of the Minto North pit (2014 through 2017), mine water will be pumped to the MPTMF. There will be no surface discharge from the Minto North Pit and no spillway.

3.3 Water Conveyance and Diversions

Infrastructure for reliable conveyance of water is a key element of the water management plan. Existing and planned water management infrastructure is discussed in Section 4.

3.4 Discharge Management

The discharge management actions described here provide a framework and specific procedures for diverting and releasing water from site.

3.4.1 Water Management Decisions and Actions

Operational water management decisions for Phase V/VI can be summarized as follows:

1. The primary water management decision for Phase V/VI is whether or not water (clean runoff or mine water) must be released from site.
2. Secondary decisions include:
    a. The quantity of water,
    b. The preferred water source, and
    c. Timing of the release.

Water must be released from site when the mine water inventory exceeds, or is projected to exceed, the inventory target. The inventory target will regularly be compared to the mine water-tracking log to determine whether the mine is operating at a water deficit or surplus or is on target. Actions to be taken in the event of a surplus when water must be released from site are described in Section 3.4.2.

Water released from site must always meet applicable water quality limits as prescribed in the water use licence. Water treatment will be required if water destined for release does not meet these limits. Options for treating water are discussed in Section 3.4.3.

Actions to be taken in the event of a mine water deficit and reporting are described in sections 3.4.5 and 3.4.6, respectively.

3.4.2 Surplus Water Inventory Actions

If the mine water inventory is running a surplus, the following action will be taken in the order listed to release water from site:

1. **Divert water from W35a to WSP:** water will be diverted from the south-west catchment (collected at station W35a) to the WSP. Historically, the water at W35a has been of a similar quality to clean runoff measured in lower Minto Creek. On-going water quality monitoring will ensure that water in the WSP remains in compliance with the water use licence water quality limits. The mine will maintain procedures, checklists, sample collection, and analysis that must be completed prior to diverting water from W35a to the WSP.
2. **Divert water from W15 to WSP:** if diversion of water from W35a in insufficient to meet water inventory and release targets then water collected at W15 can be diverted to the WSP. Water collection point W15 collects runoff from undisturbed areas and from waste rock. The water quality parameter concentrations have historically been elevated compared to undisturbed catchments but have generally met water quality limits in the months of May, June, July and August. On-going water quality monitoring will ensure that water diverted from W15 and water in the WSP remains in compliance with water quality limits in effect. The mine will maintain procedures, checklists, sample collection, and analysis that must be completed prior to diverting water from W15 to the WSP.
3. **Release mine water stored in the MPTMF or A2PTMF to WSP.** The mine water stored on site may typically (but not always) require water treatment. Water treatment considerations are discussed in Section 3.4.3. The mine will maintain procedures, checklists, sample collection, and analysis that must be completed prior to releasing water from the MPTMF or A2PTMF.

Water will only be released from the WSP to Minto Creek when the water quality complies with limits prescribed in the water use licence. In addition, the water quality, flow, and channel conditions of lower Minto Creek must be considered

before a decision is made to release water from the WSP to Minto Creek. Procedures, checklists, sample collection, and analysis must be completed prior to releasing water from the WSP.

3.4.3 Water Treatment

Water treatment may be required if:

- Water stored in the WSP does not meet water quality limits prescribed in the water use licence.
- Mine water stored in the MPTMF or the A2PTMF is to be released to Minto Creek and the water does not meet water quality limits prescribed in the water use licence.

The WSP is intended as a clean water reservoir where discharge compliant water is stored and monitored prior to release to Minto Creek. However, storm events, seepage losses from the mill valley or other events may cause certain water quality parameter concentrations to exceed water use licence water quality limits. The mine will maintain procedures that must be followed prior to treating and releasing water stored in the WSP. When treating WSP water, it may be necessary to release the treated water directly to Minto Creek from the water treatment plant rather than returning the water to the WSP.

Mine water stored in the MPTMF or the A2PTMF must likely be treated before it can be released to the WSP.

The first stage of the water treatment plant at Minto was constructed in 2010. The water treatment process included a ballasted lamella clarifier unit (Actiflo®) system for removal of TSS, total metals and dissolved copper. The process relies on the addition of alumina-based coagulant (Aluminex-5), flocculant and organo-sulphide (TMT-15) reagents to facilitate removal of TSS and to precipitate dissolved copper and other metals. Yardney sand filters and Cuno polypropylene filters were installed downstream of the clarifier unit to reduce concentrations of fine particulate matter carried over with the clarifier overflow. The plant was designed for a maximum capacity of 3,600 m^3/day but has proved to operate reliably at flows of approximately 4,000 m^3/day.

In 2012, two Reverse Osmosis (RO) trains capable of handling 2,500 m^3/day per train were added to the treatment process downstream of the existing clarification and filtration units. Treated effluent (permeate) from the RO units is also amended, when necessary, with sodium bicarbonate to adjust the pH and add salinity and alkalinity.

During Phase IV, feed water for the plant could be pumped from the Main Pit reservoir or from the WSP. Treated effluent could be directed to the Main Pit, the WSP or directly to Minto Creek. Sludge or RO brine would be pumped to the Main Pit for disposal. The Phase IV configuration will be maintained through the transition to Phase V/VI, until 2017 when the option of conveying water from and to the A2PTFM will be added to the conveyance network.

Minto's water treatment plan can be operated in three general configurations:

1. **Clarification and filtration:** this process configuration removes suspended solids (TSS). Coagulant and flocculant solutions are added to the feed water, which is pumped though a ballasted lamella clarifier and a filter. Dissolved constituents are generally not removed. The by-product of the process is a sludge that is pumped to the MPTMF or A2PTMF. The maximum treatment capacity is approximately 4,000 m^3/day.
2. **Sulphide precipitation, clarification, and filtration:** this process configuration can remove dissolved copper, cadmium, zinc, nickel, cobalt, and lead, in addition to TSS. Dissolved metals are removed by adding an organo-sulphide reagent that binds to dissolved metals and forms precipitates. The by-product of the process is a sludge that is pumped to the MPTMF or A2PTMF. The maximum treatment capacity is approximately 4,000 m^3/day.
3. **Reverse osmosis (RO):** this process removes 95–99% of all constituents in the feed water. The feed water for the RO unit is the effluent from the clarification and filtration unit, which is operated as a pre-treatment step. The RO unit produces a clean effluent stream that consists of approximately 75% of the feed water (the RO permeate). The by-product of the process is a brine stream, which consists of about 25% of the feed water and 95–99% of

constituent loadings. The brine stream is pumped to the MPTFM or A2PTMF. Because of this brine by-product, RO cannot be considered a true water treatment process but is rather a process that concentrates mine water into a smaller volume with higher constituent concentrations. The maximum treatment capacity is approximately 3,500 m^3/day.

Table 3-1 shows a summary of water treatment options and parameters that can be removed.

Table 3-1: Summary of Water Treatment Options and Applicability.

Water Treatment Process Configuration	Applicable for Removal of
Clarification and Filtration	TSS Total Metals (not dissolved metals)
Sulphide precipitation, Clarification and Filtration	TSS Total Metals Dissolved Metals, including Cu, Cd, Co, Hg, Ni, Zn
Reverse Osmosis	All other parameters, including Se, nitrate and nitrite.

3.4.4 Water Treatment Limitations

Minto's water treatment plant was originally designed to remove TSS, total metals and dissolved copper from mine water. In 2011, the mine received an amended water use licence that included water quality limits for nitrate and selenium, which the existing water inventory at the mine exceeded. As there was a potential need to treat and release mine water stored in the Main Pit, alternative or supplemental water treatment was identified as being required.

A review of conventional water treatment methods for removal of nitrate and selenium concluded that nitrate could likely be removed using anaerobic biological treatment but removal of selenium to concentrations below the water quality limit of 3.0 µg/L would not be possible/reliable using biological treatment alone. Rather, TSS removal and RO would be required as pre-treatment steps ahead of anaerobic biological treatment. In this treatment process, RO brine would be pumped to an anaerobic biological treatment process and the clean RO permeate would be released to the environment. Selenium present in the RO brine would be removed as sludge in the anaerobic water treatment process. The anaerobic process would be followed by an aerobic biological treatment process that would remove residual dissolved carbon and other nutrients carried over from the anaerobic treatment. Finally, effluent from the aerobic biological water treatment would be settled and filtered prior to release.

Although RO is considered to be a conventional technology, the treatment process described above for removal of selenium to ultra-low concentrations of 3.0 µg/L is outside the realm of conventional technology. However, the use of RO alone for removal of selenium or any other constituents is, in effect, a mine water concentration process than a true water treatment process. As described in Section 3.4.3, 95–98% of water quality parameter loadings in the mine water report to the RO brine. If RO alone is used for "treatment" of mine water, the brine would be pumped back to the MPTMF or the A2PTFM where the loadings removed would mix with the untreated mine water. This would result in a gradual increase in all parameter concentrations over time. If RO is used for an extended period of time, the parameter concentrations in the mine water reservoir may increase to a point where RO is no longer effective. In other words, long-term use of RO alone simply causes a gradual worsening of the mine water quality and therefore is not a sustainable water treatment method, particularly in the transition to closure and in the post-closure period.

3.4.5 Water Inventory Deficit Actions

If Minto's water inventory is less than approximately 600,000 m^3, the diversion of water from W15 and W35a to the WSP (if active) will be redirected to the MPTMF or the A2PTMF. If the water deficit persists, reclaim water for the mill can be drawn from the WSP.

3.4.6 Monitoring and Reporting

Monitoring of quality and quantity of water on the Minto Mine site follows the existing environmental monitoring program for the site which is largely detailed in the Environmental Monitoring Plan (Minto 2011). This program specifies locations, frequencies, and categories of sample and data collection for water quality, hydrometric and meteorological stations. Sampling is in part conducted to satisfy requirements for the WUL, QML, and the MMER and in part for operational purposes. All data required for the water management plan is collected through the environmental monitoring program or required by the WUL.

Monthly mine water inventory tracking reports are prepared and submitted to Minto's environmental manager and general manager. The reporting format provides an account of the mine water inventory, status, and operation of diversion structures and water treatment plant. Reporting is also required by the current water use licence and results of the monitoring are submitted to stakeholders and regulators on a monthly, quarterly, and annual basis.

3.4.7 Water Release Contingency Plan

The discharge management plan outlined above relies on the following controls for ensuring that the quality of water to be released to Minto Creek meets water quality limits defined in the Water Use License:

1. Water quality sampling and analysis of water to be diverted to the WSP along with historical information of typical water quality trends (expected water quality).
2. Water quality sampling and analysis of water to be diverted to Minto Creek.
3. Various configurations of water treatment if water to be released exceeds quality limits.

However, situations may arise where the monitoring and water treatment controls are not adequate to meet water quality limits, which would prevent Minto from releasing water to Minto Creek. Such situations could result from the following conditions:

1. If water quality limits at W2 defined in Water Use License QZ96-006, Amendment 8 remain in effect and if background water quality in lower Minto Creek continues to exceed those water quality limits, as was the case in 2011, 2012 and currently in 2013.
2. During transition to closure if the existing (Water Use License QZ96-006, Amendment 8) limits on effluent selenium and nitrate concentrations (3.0 µg/L and 7.65mg/L, respectively) remain in effect. During transition to closure, the use of RO would not be useful for managing ultra-low selenium concentrations for the reasons described in Section 3.4.4.

Minto is proposing new standards as part of the Phase V/VI proposal and further details can be found in Section 7 of the *Minto Explorations Ltd. Project Proposal: Phase V/VI Expansion of Mining and Milling* (Minto 2013a).

4 Water Management Infrastructure

4.1 Water Conveyance Network

The Minto Mine water conveyance network consists of diversion ditches, culverts, sumps, pumps, and pipelines installed throughout the mine site. The system is designed to segregate clean runoff and mine water. Clean water is conveyed to the WSP while mine water is conveyed to the mine water storage reservoirs, which includes the Main Pit for Phase IV and the MPTFM and A2PTFM for Phase V/VI.

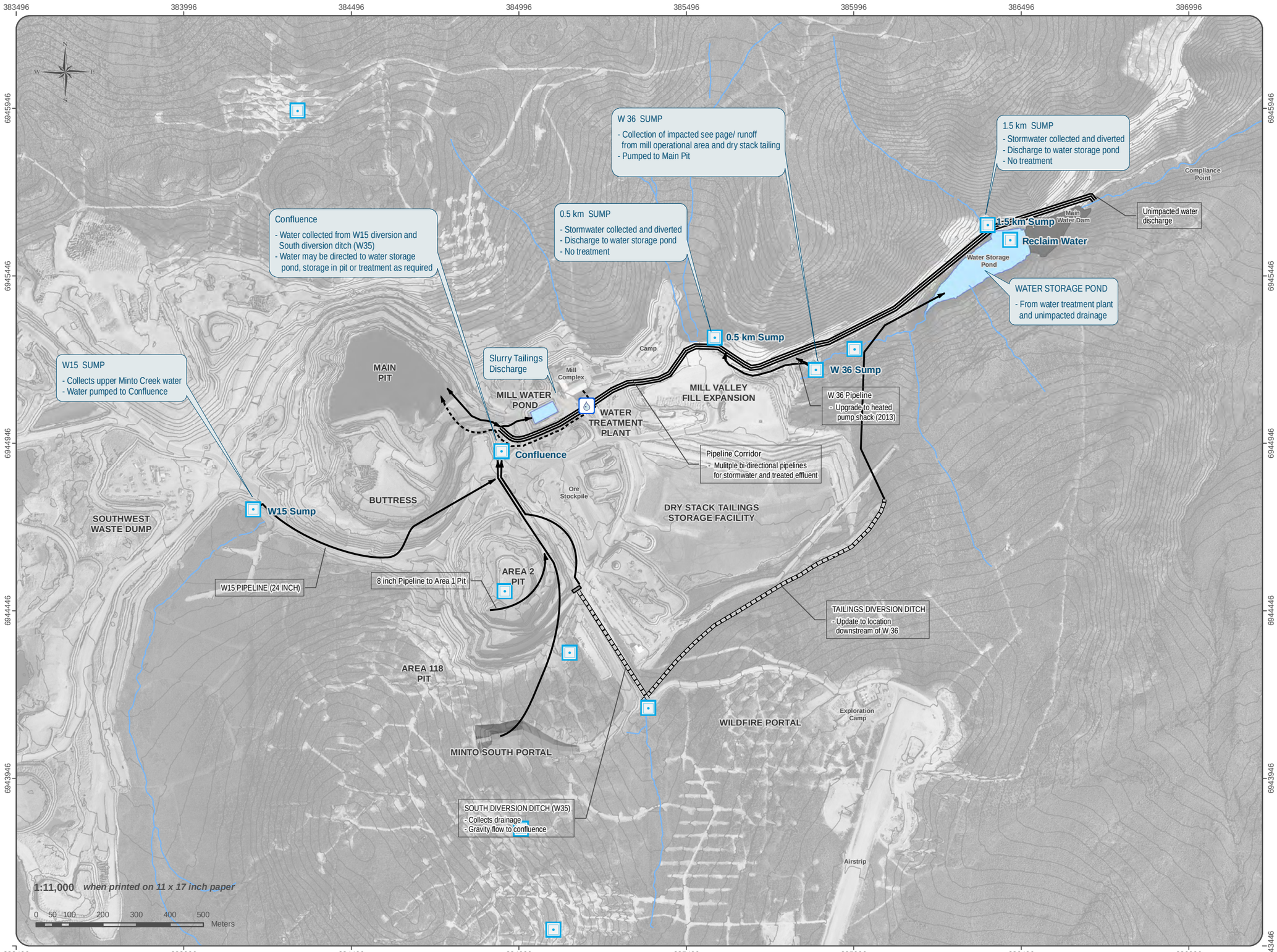
Figure 4-1 shows the location of water conveyance infrastructure that is in place for the Phase IV operation. The mine water infrastructure is described in T. Infrastructure for diverting clean runoff includes the W35a sump, South diversion ditch,

tailings diversion ditch and the 0.5 km and 1.5 km sumps and ditches. Mine water conveyance infrastructure includes the W15 and W37/W36 sumps.

Infrastructure planned for Phase V/VI is shown in Figure 4-2. Changes to the conveyance network for the Phase V/VI expansion include:

- Further development of the Main Pit into a tailings management facility (MPTMF) and as a reservoir for storage of mine water;
- Development of the Area 2 Pit into a tailings management facility (A2PTMF) and as a reservoir for storage of mine water;
- Addition of mine water sumps and mine water pipelines to dewater the Ridgetop North Pit, and Ridgetop South Pit and a sump for the Minto North pit;
- Additional pipelines to dewater the underground workings at portal locations;
- Addition of tailings slurry and reclaim lines from the mill to the A2PTMF and the Ridgetop North TMF;
- Modification of the Tailings Diversion Ditch to increase capacity and include piping of runoff from the eastern end of the ditch to the WSP; and
- Decommissioning of the south diversion ditch and modification to the W35a collection point to allow for conveyance of several features.

The infrastructure upgrades were planned to maximize the ability to divert clean runoff away from developed mine areas and towards the WSP. The conveyance network is intended to provide a high degree of operational flexibility such that appropriate water management actions can be taken based on informed management decisions.



MINTO MINE PHASE V/VI EXPANSION

FIGURE 4-1

MINTO MINE PHASE IV WATER CONVEYANCE NETWORK

JULY 2013

Minto Explorations Ltd.
A SUBSIDIARY OF CAPSTONE MINING LTD.

- Collection Point
- Water Treatment Plant
- Pipe Alignment
- Piping Corridor
- Tailings Slury Discharge
- Diversion Ditch

ACCESS

Aerial imagery obtained from Challenger Geomatics. Imagery acquired August 14 th 2012.
Site contours derived from 2012 aerial imagery obtained from Challenger Geomatics.

Hydrology data provided by Minto Explorations Ltd, May 2009.

Datum: NAD 83 Projection: UTM Zone 8N

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Table 4-1: Minto Mine Phase IV Water Management Infrastructure.

Reservoirs	
Main Pit	The main reservoir for storage of mine water. Total capacity to the natural spill elevation is approximately 4.9 Mm^3.
Mill Pond	Reservoir for storage of process water. Total capacity is approximately 5,000 m^3.
WSP	Stores clean water destined for release to Minto Creek. Total capacity is approximately 320,000 m^3.
Water Conveyance	
W15 sump	Collects runoff and seepage from the western sub-catchments on the Minto Site and conveys the water via a 24-inch pipeline to the Main Pit or WSP (see Figure 2-1).
W35a sump	Collects runoff and seepage from the southern undisturbed sub-catchments on the Minto Site and conveys the water to the Main Pit or WSP (see Figure 2 1).
W37/W36 sump	Collects and pumps Mill Valley seepage to the Main Pit.
0.5 km and 1.5 km sumps and ditches	Collects runoff from sub-catchments north of the Minto Mine access road. Runoff collected is diverted to the WSP.
South diversion ditch	Collects runoff from sub-catchments located south of the dry stack tailings facility.
Area 2 Pit sump	Water collected in the Area 2 Pit sump is pumped to the Main Pit via an 8-inch pipeline.
Minto South Portal sump	Water collected in the south portal sump is pumped via a water truck to the Main Pit or an 8-inch pipeline.
Confluence	Hub located between the Main Pit and Area 2 pit where water from W15 and W35a may be directed to the Main Pit or to the WSP.
WSP discharge	Pumps and pipes for releasing water at a rate up to 15,000 m3/day from the WSP to Minto Creek.
Reclaim Water	
Reclaim water line from the WSP to the mill	Conveys up to 4,500 m^3/day of water from the WSP to the mill.
Reclaim water line from the Main Pit to the mill	Conveys up to 4,500 m^3/day of water from the Main Pit to the mill.
Tailings Conveyance	
Tailings line from the mill to the Main Pit	Conveys slurried tailings and water from the mill to the Main Pit.
Water Treatment	
Water treatment plant	Accepts feed water from the Main Pit or WSP and discharges treated water to the Main Pit, WSP or Minto Creek. Sludge and brine produced in the treatment process is pumped to the Main Pit.

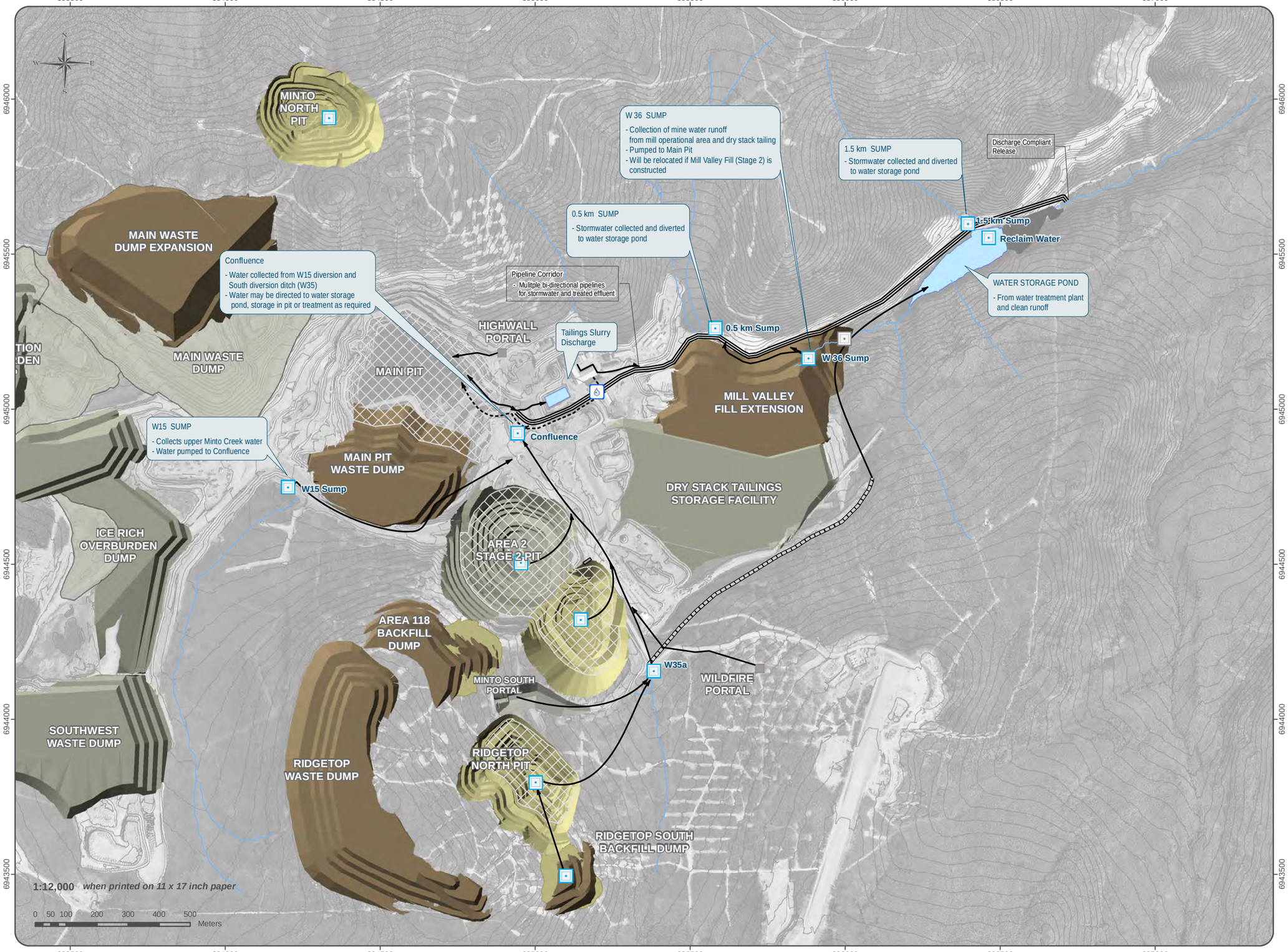
MINTO MINE PHASE V/VI EXPANSION

FIGURE 4-2

MINTO MINE PROPOSED PHASE V/VI WATER CONVEYANCE NETWORK

JULY 2013

CAPSTONE MINING CORP.
MINTO MINE
OPERATED BY MINTO EXPLORATIONS LTD.



- Collection Point/Sump
- W-36 Potential location for relocation
- Water Treatment Plant
- Pipe Alignment
- Piping Corridor
- Tailings Slury Discharge
- Diversion Ditch
- Tailings
- Dumps
- Pits
- Phase IV Features
- Main Pit Dam

ACCESS

Aerial imagery obtained from Challenger Geomatics. Imagery acquired August 14 th 2012.
Site contours derived from 2012 aerial imagery obtained from Challenger Geomatics.

Hydrology data provided by Minto Explorations Ltd, May 2009.

Datum: NAD 83 Projection: UTM Zone 8N

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Table 4-2: Minto Mine Proposed Phase V/VI Water Management Infrastructure.

Reservoirs	
Main Pit	To be developed further as a tailings management facility (MPTFM).
Area 2 Pit	To be developed as a tailings management facility (A2PTMF) after completion of mining.
Mill Pond	Operated as in Phase IV.
WSP	Operated as in Phase IV.
Water Conveyance	
W15 sump	Operated as in Phase IV.
W35a sump	Modified as part of the decommissioning of the south diversion ditch and diversion to the tailings diversion ditch.
W37/W36 sump	If the Mill Valley Fill Expansion extends further, the W36 sump may be relocated approximately 200 m downstream towards the WSP such that the toe of the W36 containment berm will be equal to the water storage pond dam spillway elevation.
0.5 km and 1.5 km sumps and ditches	Operated as in Phase IV.
South diversion ditch	Decommissioned and flow diverted via the tailings diversion ditch.
Tailings diversion ditch	Modified to allow for greater flow capacity, and to include piping of runoff from the eastern end of the ditch to the WSP.
Area 2 Pit sump	Operated as in Phase IV during development and mining. Developed as a TMF after completion of mining.
Minto South portal sump	Water collected in the South Portal sump is pumped to the Main Pit via an 8-inch pipeline.
Confluence	Hub located between the Main Pit and Area 2 pit where water from W15 and W35a may be directed to the Main Pit or to the WSP.
WSP discharge	Configured as in Phase IV.
Ridgetop North sump	Runoff collected in the Ridgetop North Pit and Ridgetop North TMF is pumped it to the A2PTFM.
Ridgetop South sump	Runoff collected in the Ridgetop South Pit is pumped it to the MPTMF.
Minto North sump	Runoff collected in the Minto North Pit is pumped it to the MPTMF.
Reclaim Water	
Reclaim water line from the WSP to the mill	Configured as in Phase IV.
Reclaim water line from the MPTMF to the mill	Configured as in Phase IV.
Reclaim water line from the A2PTMF to the mill	New reclaim line that conveys up to 4,500 m3/day of water from the Main Pit to the mill.
Tailings	
Tailings line from the mill to the Main Pit	Conveys slurried tailings and water from the mill to the MPTMF or the A2PTMF.
Water Treatment	
Water treatment plant	Accepts feed water from the MPTMF, the A2PTMF or the WSP and discharges treated water to the MPTMF, A2PTMF, WSP or Minto Creek. Sludge and brine produced in the treatment process is pumped to the MPTMF.

5 Transition to Closure

This section provides an overview of water management measures that would be implemented in preparation for closure. Details concerning closure are described in the Preliminary Reclamation and Closure Plan, Phase V/VI Expansion (PRCP, Appendix W to the Phase V/VI Project Proposal.)

In preparation for closure, it is anticipated that the final tailings surface in the MPTMF will be re-graded and covered with an engineered soil cover consisting of a waste rock layer for trafficability and an isolating soil cover from locally available soil materials. The surface will be shaped to convey local runoff and water from upgradient catchments across the reclaimed MPTMF via a constructed wetland treatment system (CWTS) and through a constructed spillway to A2PTFM as indicated in Figure 5-1(ACG 2013).

At closure, all open pits will be allowed to fill with water to their natural invert levels. The A2PTMF will become the central reservoir for surface runoff from the Main Pit, Area 2 Pit, W15 and W35a sub-catchments, which include the Ridgetop North, Ridgetop South and Area 118 pits (seeFigure 2-1). After Phase V/VI tailings discharge is complete, it is expected to take two to five years for A2PTMF to fill to capacity. The A2PTMF will discharge to the reconstructed Minto Creek channel via a constructed spillway.

At closure, runoff from the WSP and W37 sub-catchments will report to the Mill Valley and WSP. The Minto North Pit will be allowed to fill when mining is complete. The Minto North Pit is situated in the McGinty Creek catchment near the ridge-line to the upper Minto Creek catchment. Because of the small upstream catchment area, filling the pit is expected to take more than 100 years.

Isolating soil covers will be placed on all waste facilities, and runoff and seepage will be treated as required with passive or semi-passive treatment systems—primarily CWTSs (W15 area, Main Pit, Water Storage Pond area) and bioreactors as required through adaptive management planning (potentially seepage areas at toe of SWD, and W37 area at toe of MVFE.)

The main water management challenge during transition to closure is expected to be the management of any remaining mine water stored in the A2PTFM. Although every reasonable effort will be made to limit the mine water inventory during the Phase V/VI operations it is expected that between 600,000 m^3 and 1,000,000 m^3 of mine water will be stored in the A2PTMF when the mine operation ends. The mine water stored in site at closure will likely require treatment before it can be released to Minto Creek. Therefore, the water treatment plant will remain operational for a period of up to five years post-closure, to ensure that mine water collected during the operations phase can be campaigned off site. The quality of mine water runoff is expected to improve over time after closure of the mine. Freshly mined areas generally contribute greater loadings of water quality parameters than developed areas that have been dormant for a number of years. Therefore, the water quality of the A2PTMF is expected to gradually improve over time.

In the event that water collected in the A2PTMF does not meet water quality limits after a five year period a number of water management measures would be considered. Such measures are included in the framework for an adaptive management plan (Appendix A to PRCP) and could include:

- Continuation of active water treatment and release of treated mine water.
- In-pit, semi-passive treatment using lime or in-situ anaerobic biological treatment with or without subsequent water treatment.

Which mitigation measure(s) will be adopted depends on which parameter(s) exceed water quality limits and the magnitude of the exceedance. The specific triggers and responses will be developed further in the closure planning process as the PRCP advances through the licensing stages.

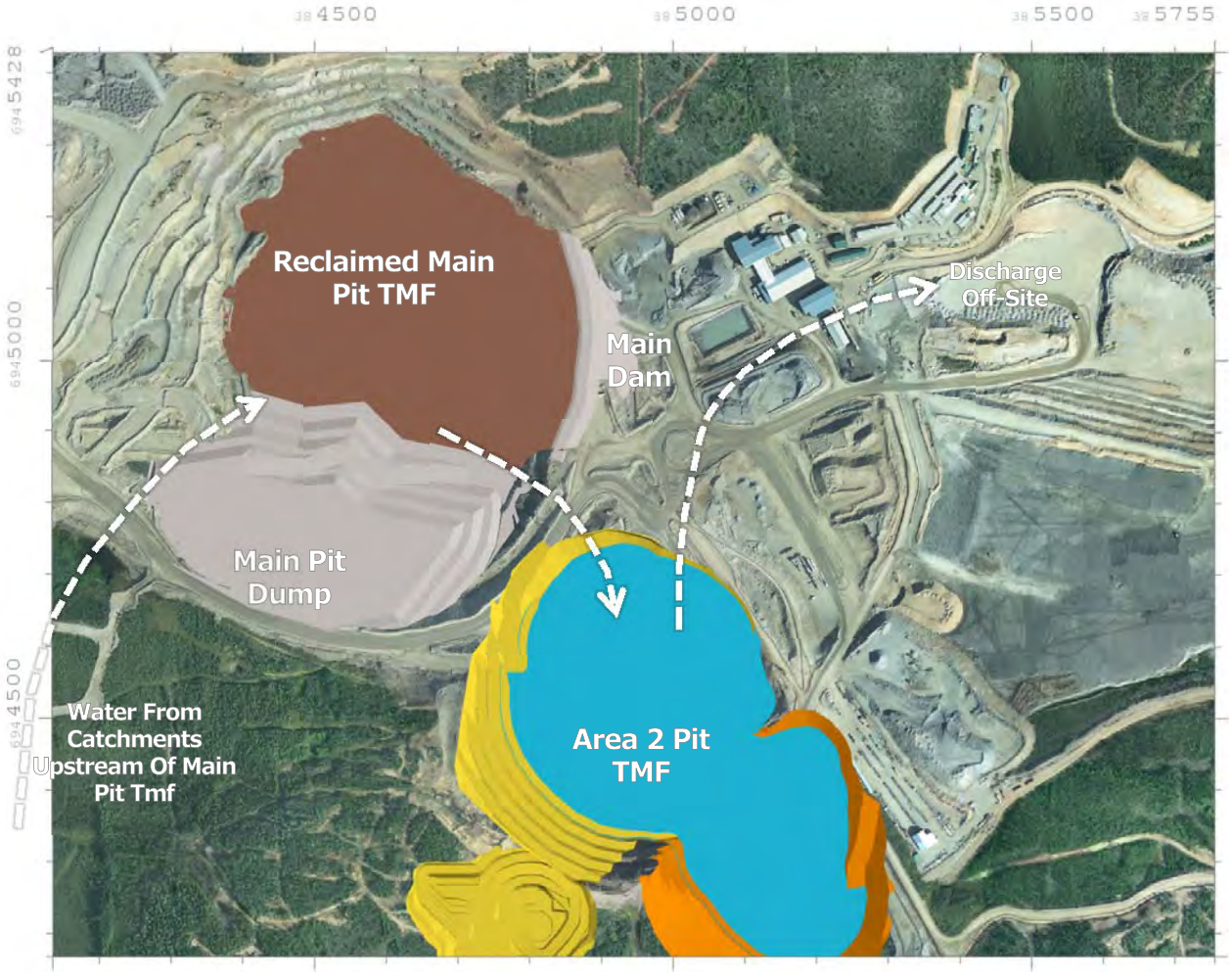

Figure 5-1: Conceptual Post-Closure Water Routing.

6 Summary

The water management strategy for Phase V/VI of the Minto Mine development is to limit and manage the inventory of mine water stored on site, primarily by segregating clean runoff and mine water. Clean runoff is to be diverted to the WSP and Minto Creek while mine water is to be used for milling of ore and sub-aqueous deposition of tailings and waste rock.

The phase V/VI water management work flow includes three steps:

Step 1. Define a mine water inventory target.

Step 2. Track the site's mine water inventory

Step 3. Take actions to address mine water deficits or surpluses, if required, and repeat Step 1 and 2.

The mine water inventory target will be updated every six months or as required. Regular tracking of the site's water inventory will provide water operators with a defined basis for making water management decisions. The primary on-going water management decision for Phase V/VI is whether or not additional water must be release from site. If additional water must be released, then secondary decisions include how much water, the preferred water source, and timing of the release.

The discharge management plan ranks methods for releasing water from site as follows (most to least preferred):

1. Divert water from W35a to WSP and from there to Minto Creek.
2. Divert water from W15 to WSP and from there to Minto Creek.
3. Treat and release mine water stored in the MPTMF or A2PTMF to WSP and from there to Minto Creek.

Water stored in the WSP is expected to meet water quality limits defined in the water use license. If one or more water quality parameter concentrations exceed the water quality limit(s), the water from the WSP must be treated prior to release.

Infrastructure additions and improvements planned for Phase V/VI include:

- Further development of the Main Pit into a tailings management facility (the MPTMF) and as a reservoir for storage of mine water;
- Development of the Area 2 Pit into a tailings management facility (the A2PTMF) and as a reservoir for storage of mine water;
- Addition of mine water sumps and mine water pipelines to dewater the Ridgetop North and Ridgetop South pits, and a sump for the Minto North pit;
- Additional pipelines to dewater the underground workings at portal locations;
- Addition of tailings slurry and reclaim lines from the mill to the A2PTMF and the Ridgetop North TMF;
- Modification of the tailings diversion ditch to increase capacity and include piping of runoff from the eastern end of the ditch to the WSP; and
- Decommissioning of the south diversion ditch and modification to the W35a collection point to allow for conveyance of several features.

When transitioning to closure, the main water management challenge is likely to be the treatment and release of mine water accumulated during the operations phase. Therefore, the water treatment plant will remain active for five years after the end of operation to help improve the quality of water stored on site, if required. After five years, the mitigation strategy will be reevaluated.

7 References

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Appendix A: Level-Volume Curves for the MPTMF and A2PTMF.

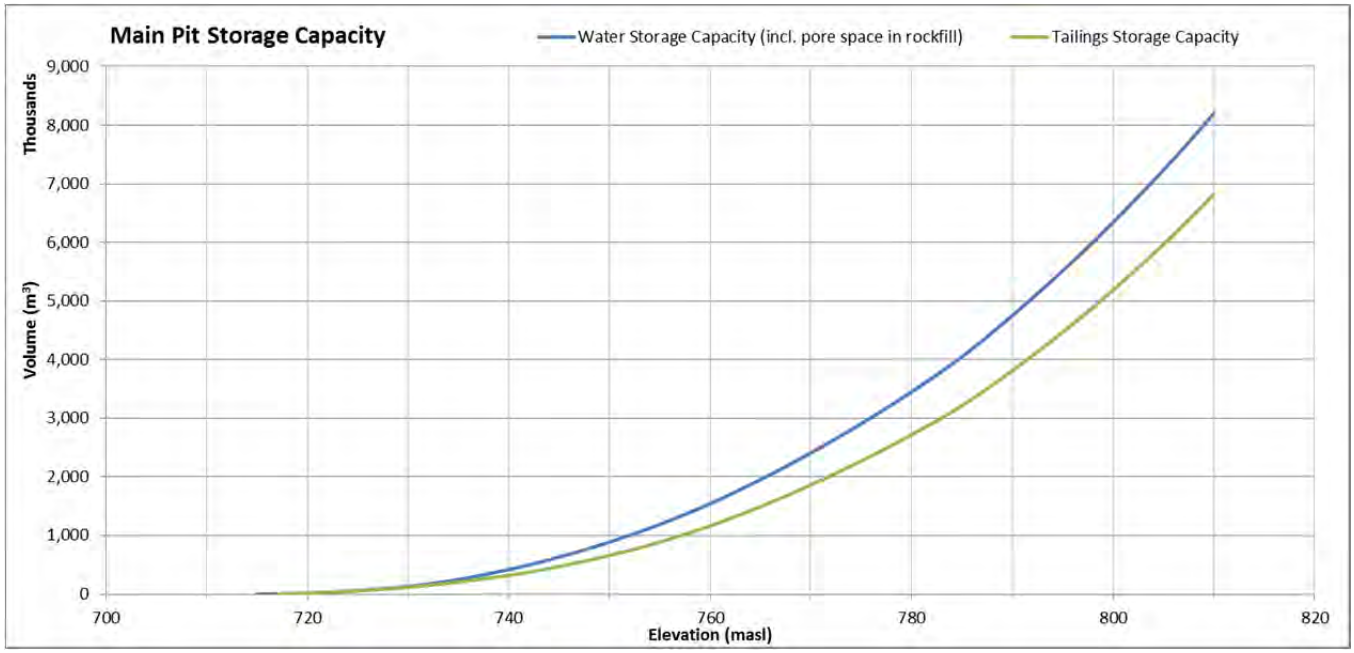

Figure A-1: Main Pit TMF Volume-Elevation Curves

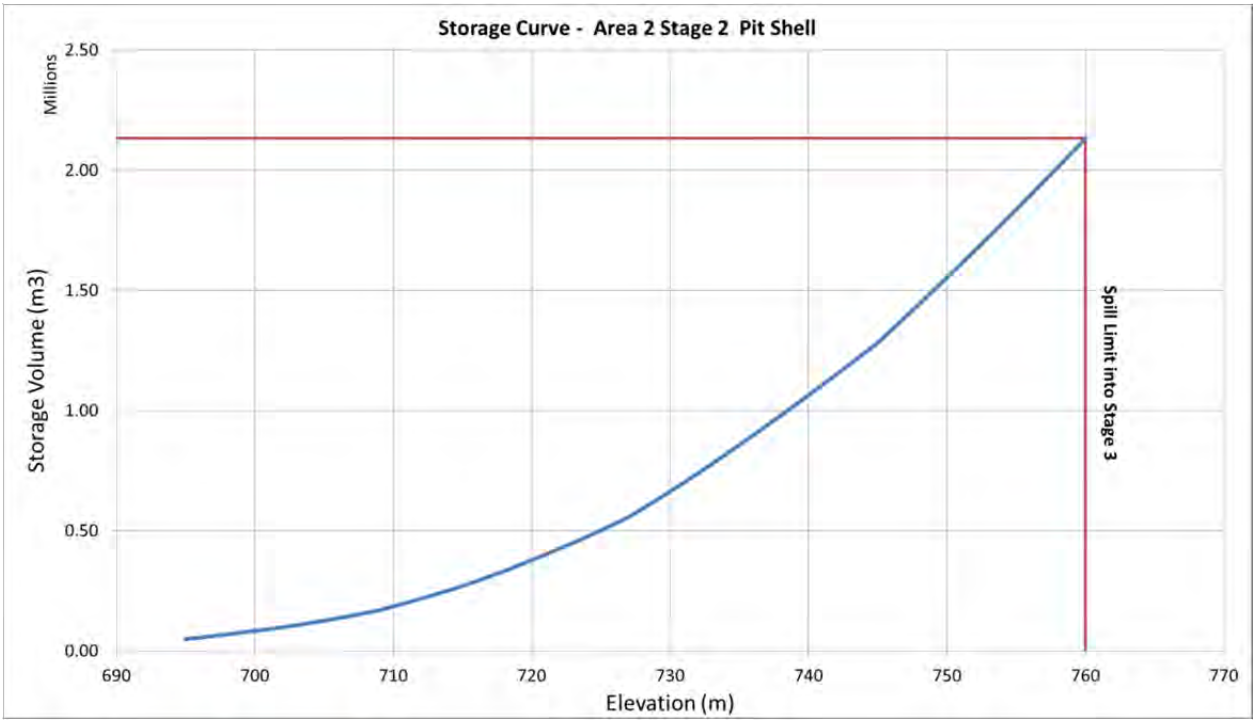

Figure A-2: Storage curve for Area 2 Stage 2 (below 760 m elevation)

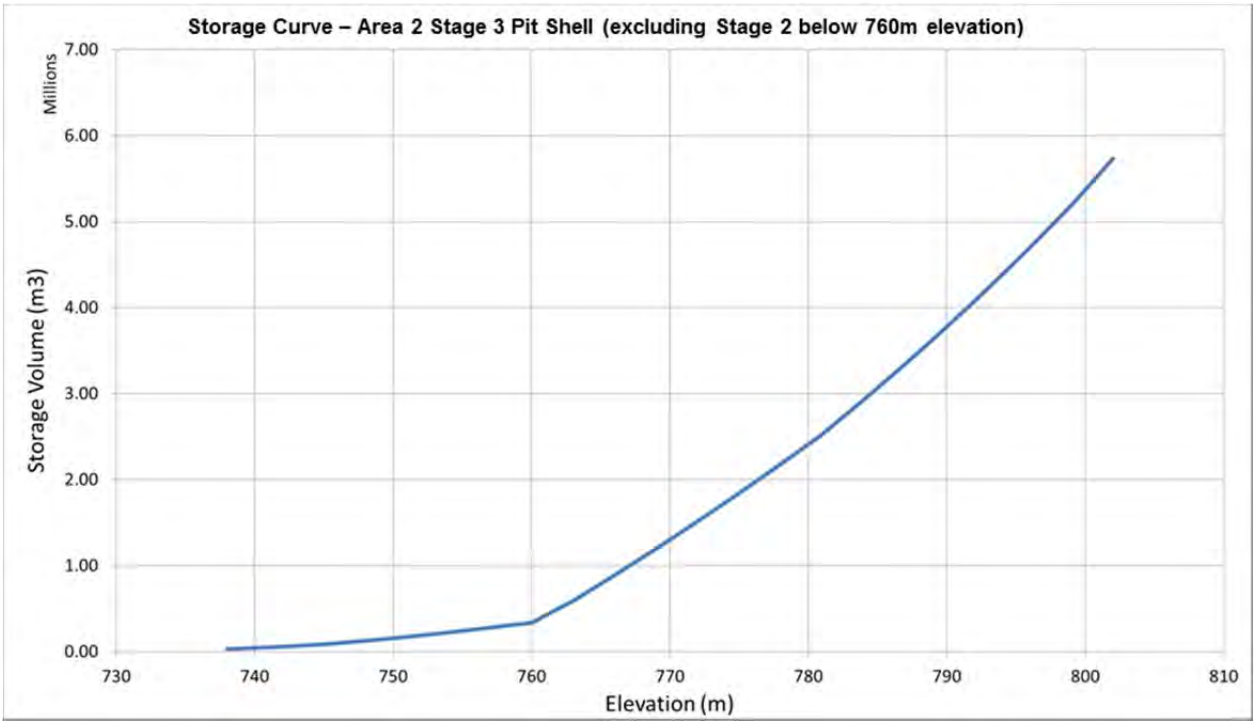

Figure A-3: Storage curve for Area 2 Stage 3 (including Area 2 Stage 2 above 760 m elevation).

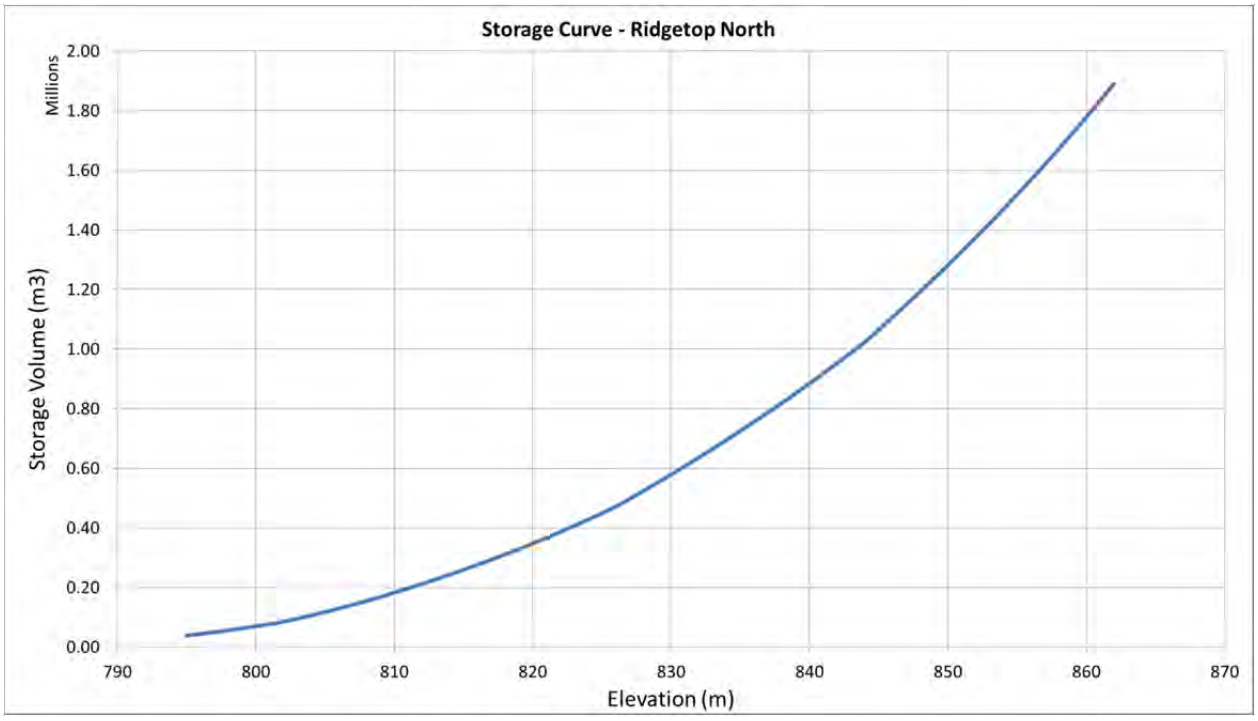

Figure A-4: Storage curve for Ridgetop North