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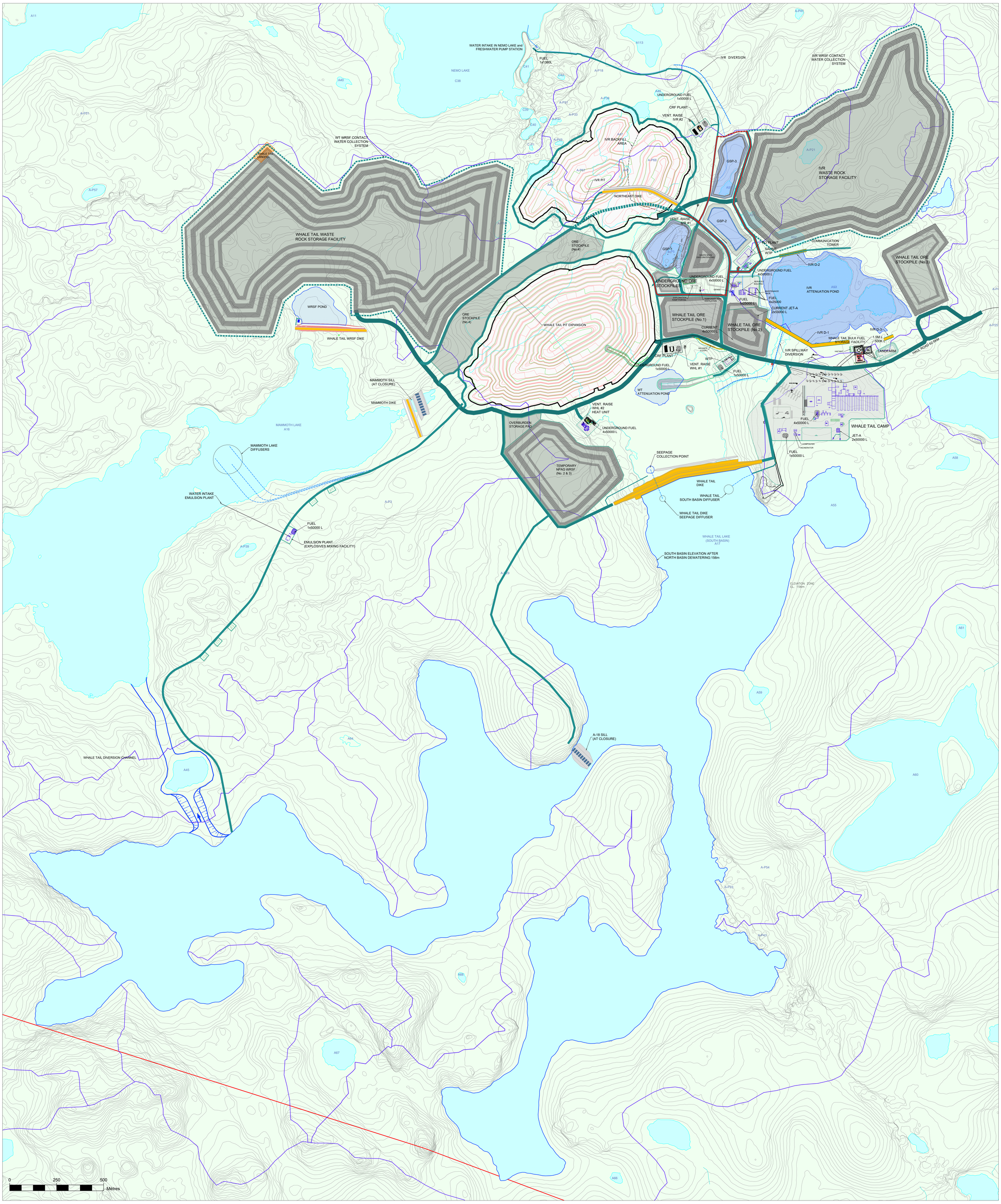
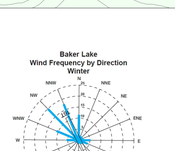


Baker Lake
Wind Frequency by Direction
Winter



LEGEND

- WATERSHED
- ATTENUATION POND
- LAKE WATER
- OPEN PIT
- HAUL ROAD, LARGE WIDE
- HAUL ROAD, SINGLE LANE
- SERVICE ROAD
- ROAD, SALT PROTECTION
- ROCK PILE
- WATER POND
- PAD
- BUILDING
- SILL

NOTES GÉNÉRALES / GENERAL NOTES

ISSUED FOR PERMITTING
AGNICO EAGLE DATE : 2019-05-03

TITRE / TITLE	# DWG

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

REV	DESCRIPTION	DATE	PAR BY

REVISIONS

AMARUQ PROJECT

AGNICO EAGLE

DESSINÉ PAR DRAWN BY	JOCELYN CRETE	DATE 2019-04-28
VÉRIFIÉ PAR CHECKED BY	MICHEL GROLEAU	2019-04-30
APPROUVÉ PAR APPROVED BY		
PROJET NO. PROJECT NO.	6117	
DATE		

TITRE / TITLE
AGNICO EAGLE – MEADOWBANK DIVISION
AMARUQ MINE PROJECT
005 – SITE PREPARATION
210 GENERAL ARRANGEMENT
AMARUQ MINE SITE ARRANGEMENT – PERMITTING

ÉCHELLE SCALE	FICHIER FILE
NTS	

NO. DESSIN DRAWING NO.	REVISION	FEUILLE / SHEET
6117-005-210-001	0	2 / -

FILE NO.

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APPENDIX B • WATER MANAGEMENT SCHEMATIC FLOW SHEETS

Note that these flow sheets are from Golder 2019d and were updated to include the discharge of landfarm contact water to the IVR Attenuation Pond

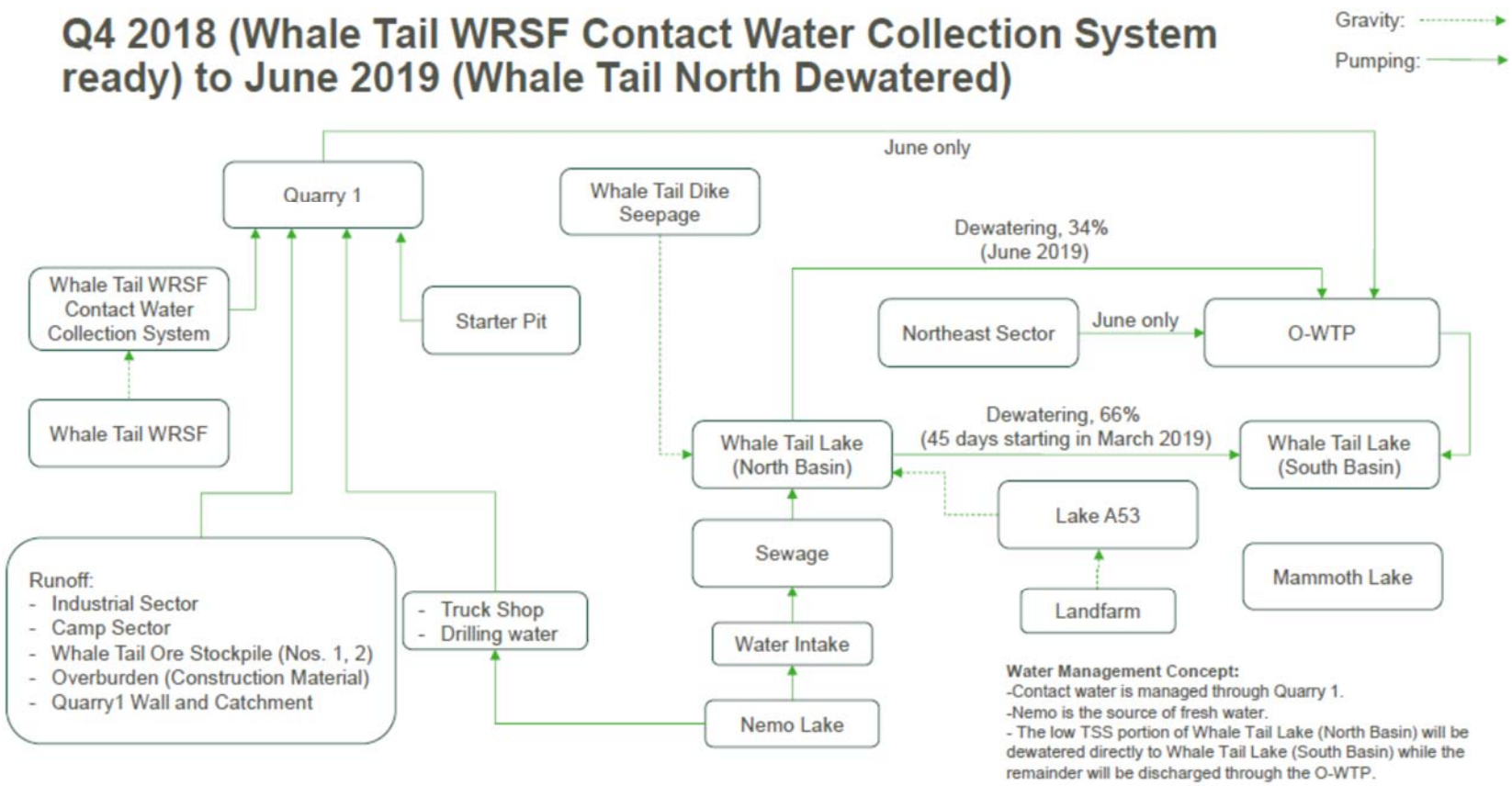


Figure B.1 Water Management Flowsheet from Construction to June 2019

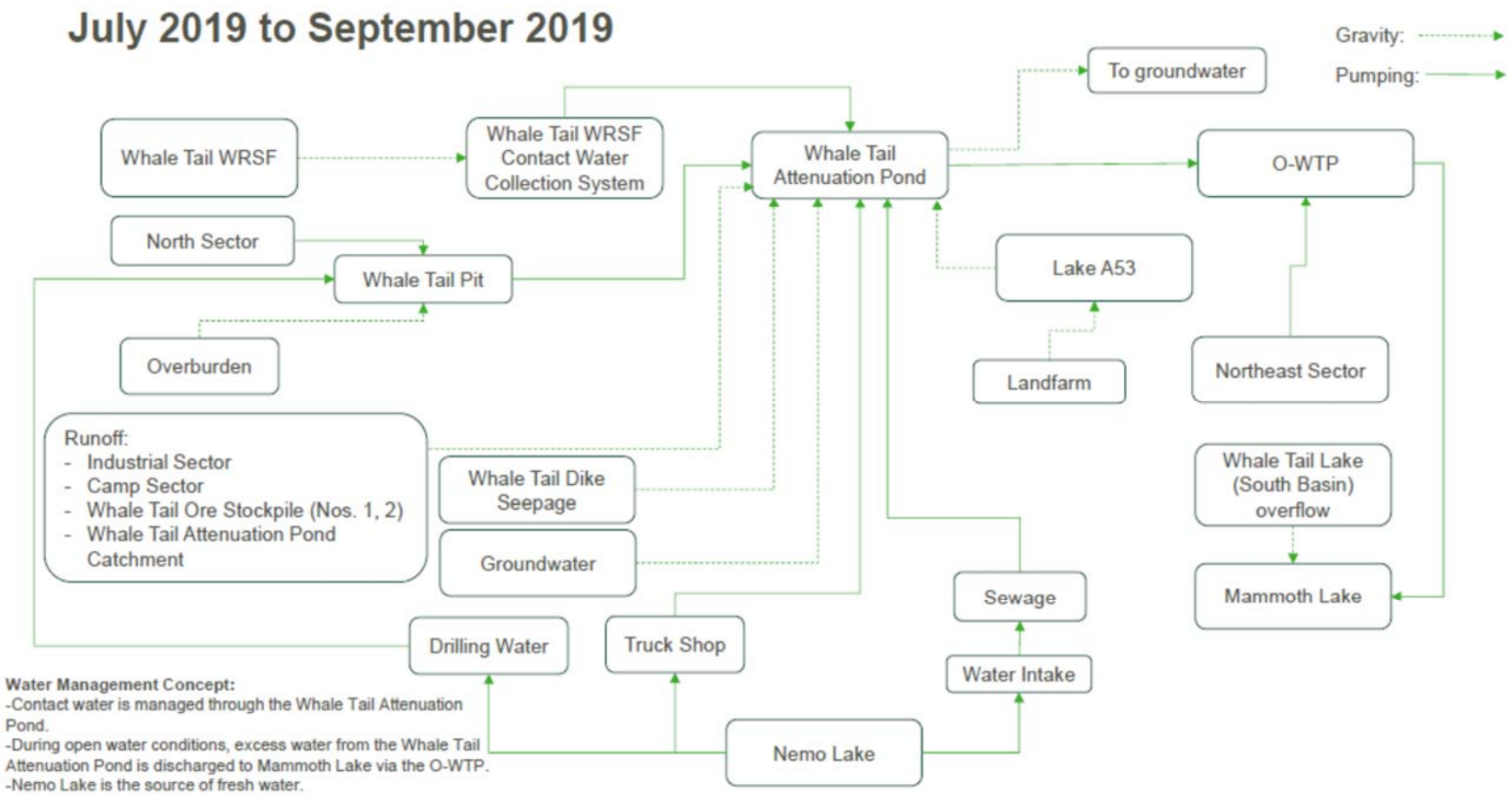


Figure B.2 Water Management Flowsheet during operations from July 2019 to September 2019

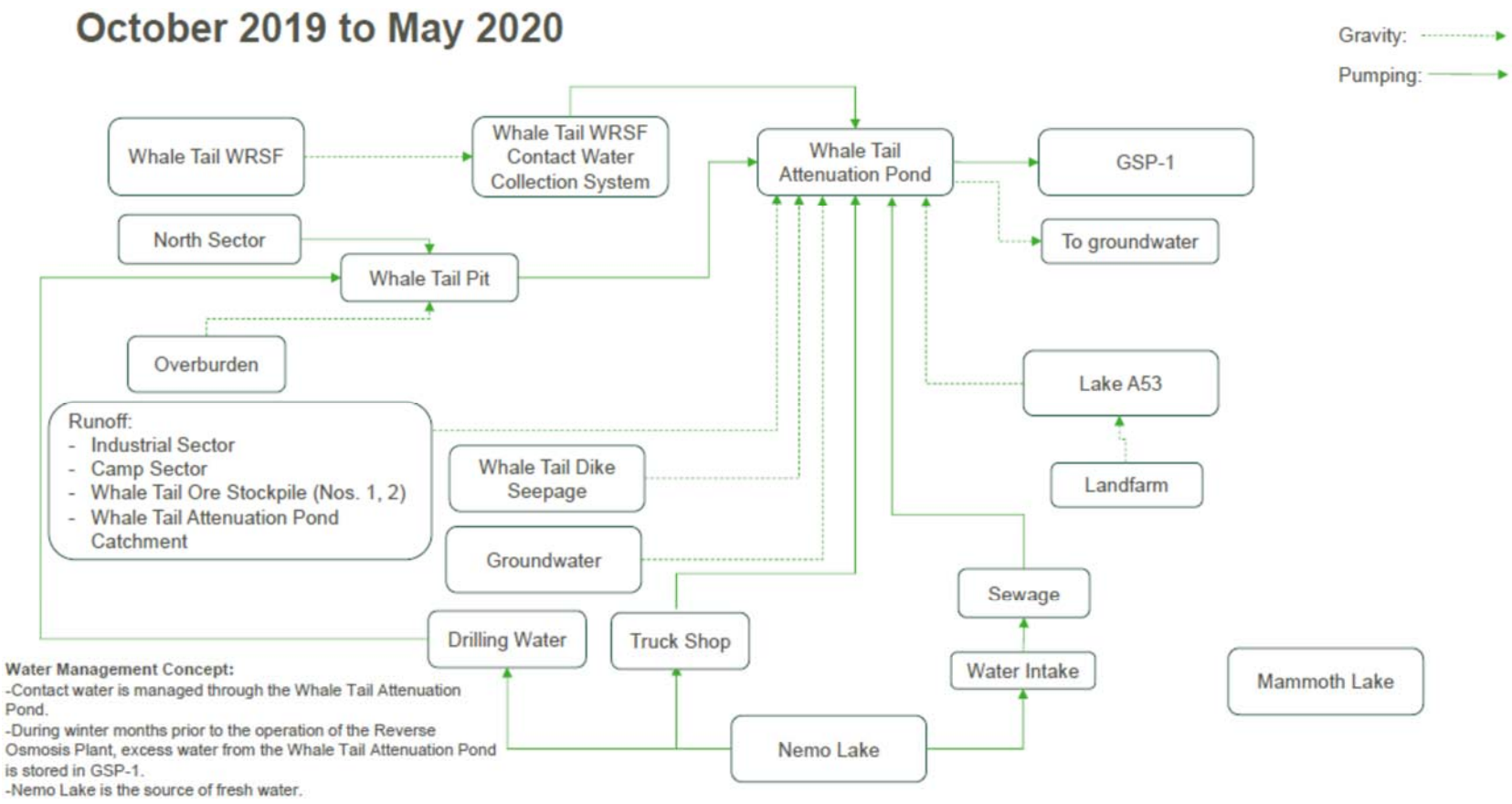


Figure B.3 Water Management Flowsheet during operations from October 2019 to May 2019

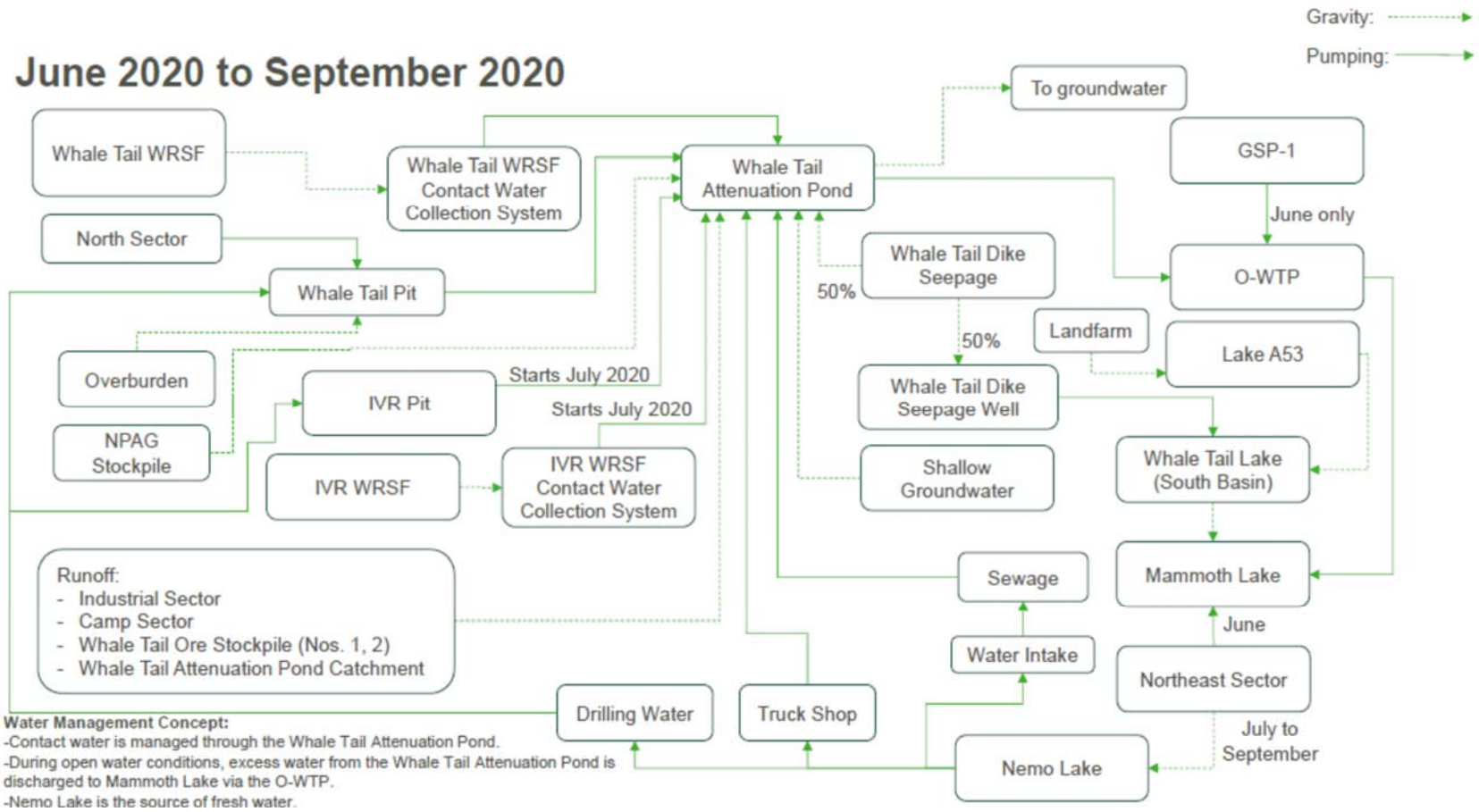


Figure B.4 Water Management Flowsheet during operations from June 2019 to September 2019

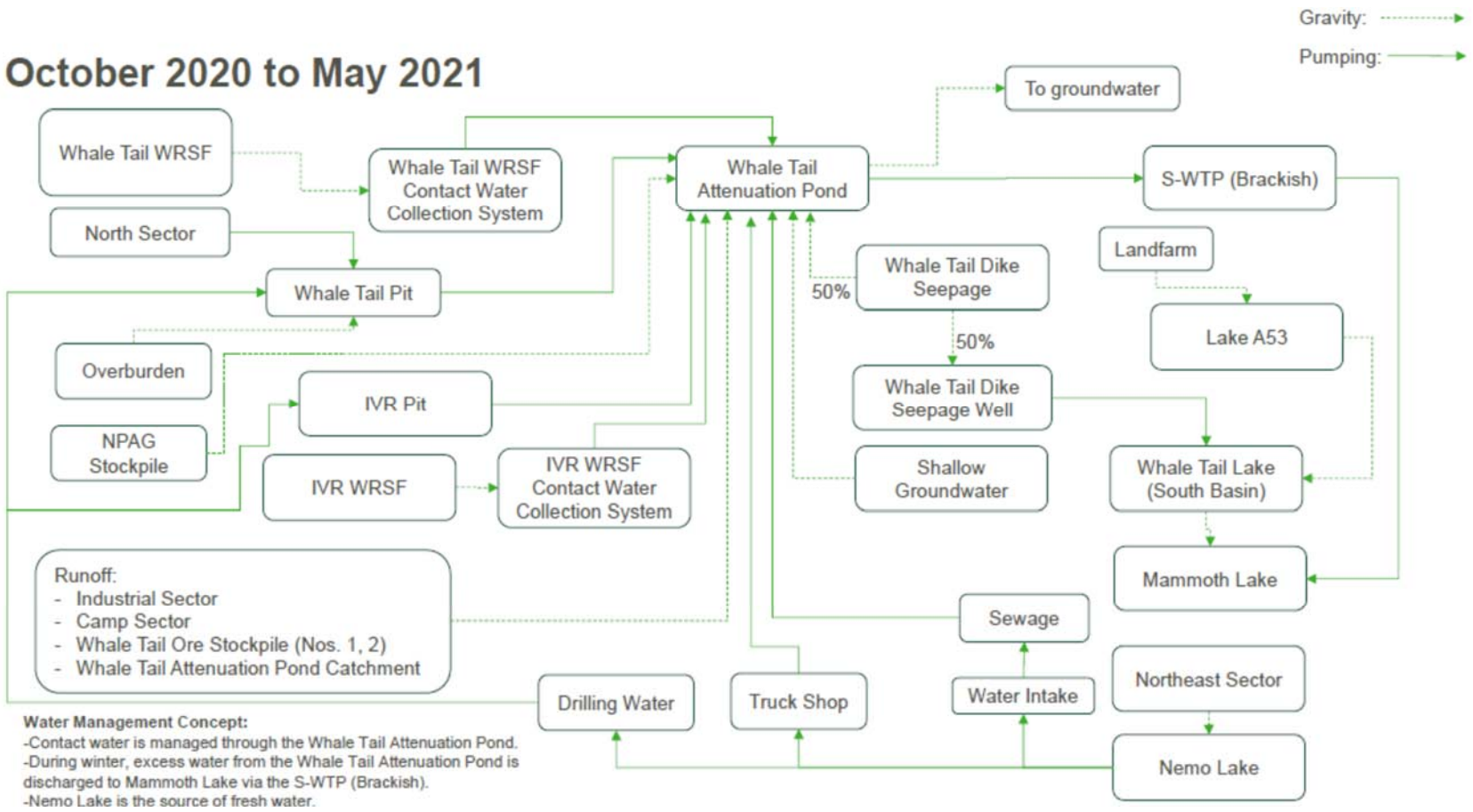


Figure B.5 Water Management Flowsheet during operations from October 2020 to May 2021

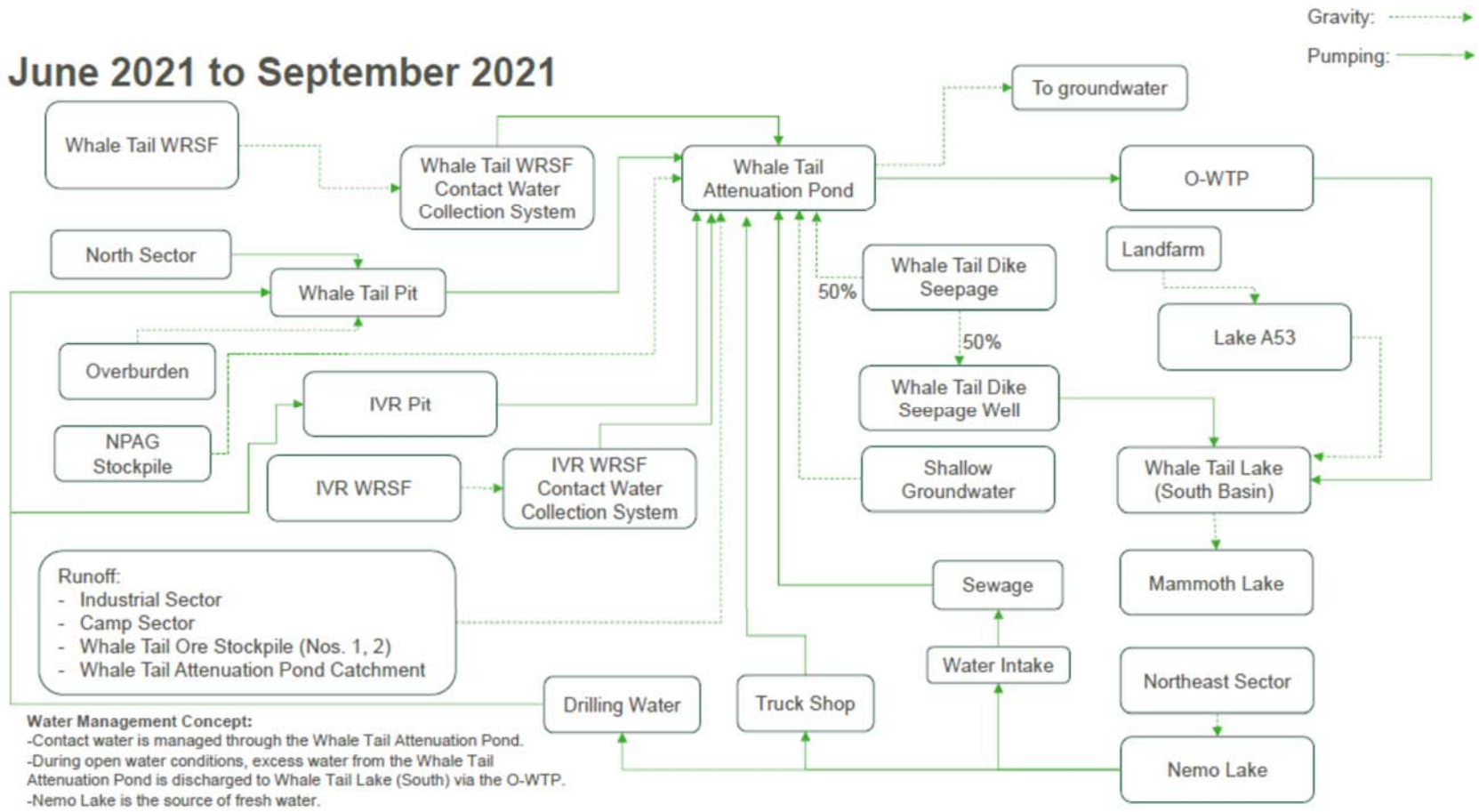


Figure B.6 Water Management Flowsheet during operations from June 2021 to September 2021

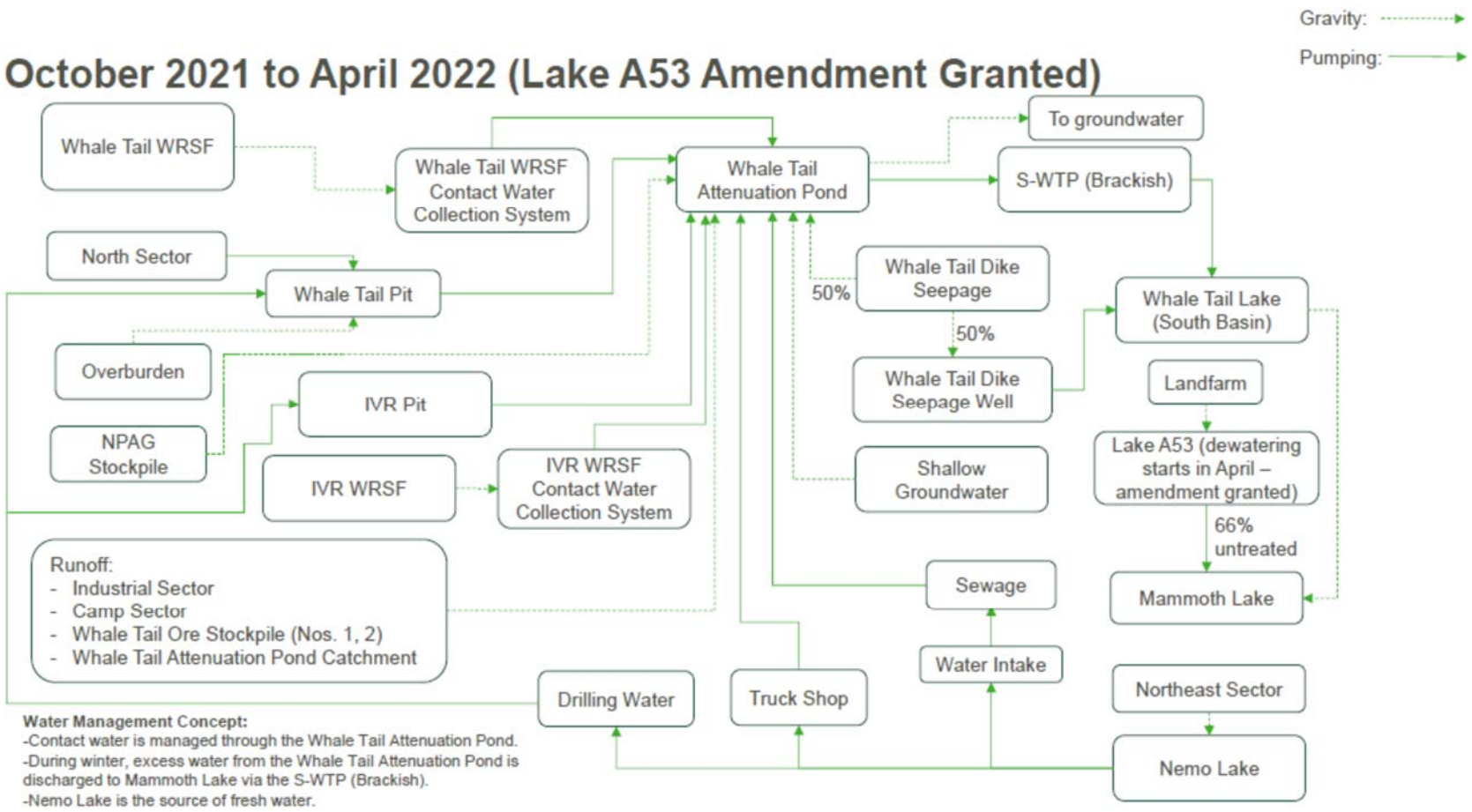


Figure B.7 Water Management Flowsheet during operations from October 2021 to April 2022

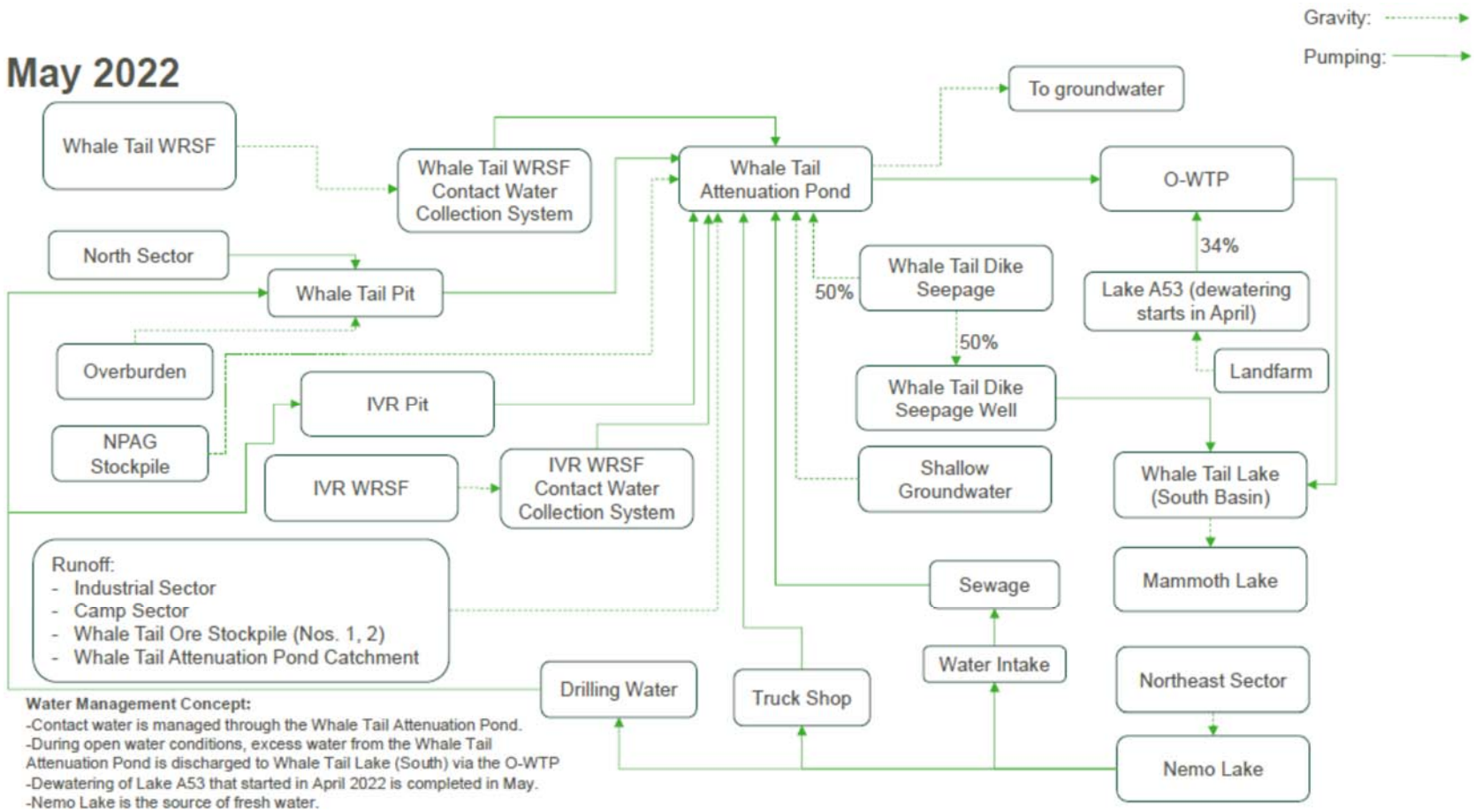


Figure B.8 Water Management Flowsheet during operations May 2022

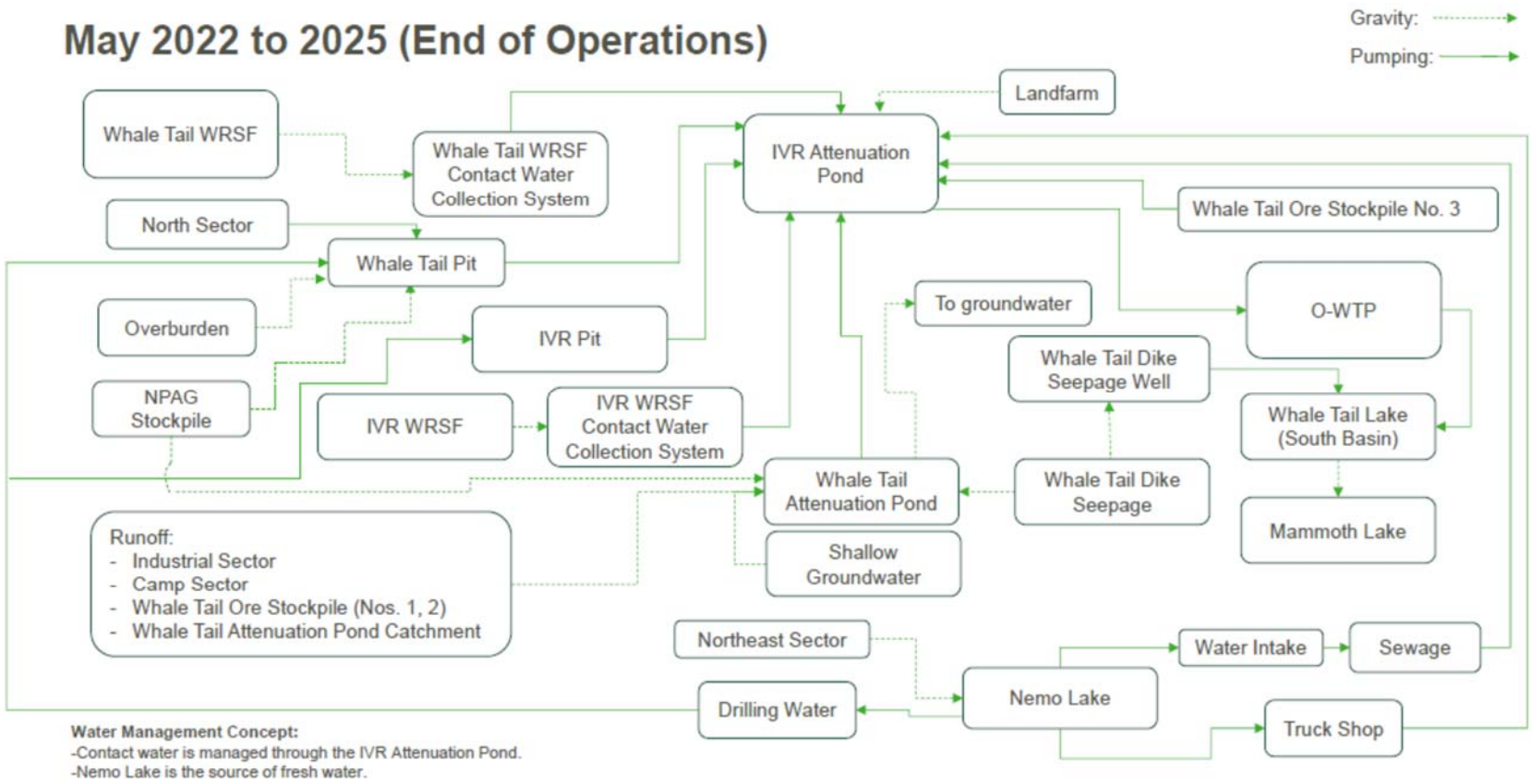
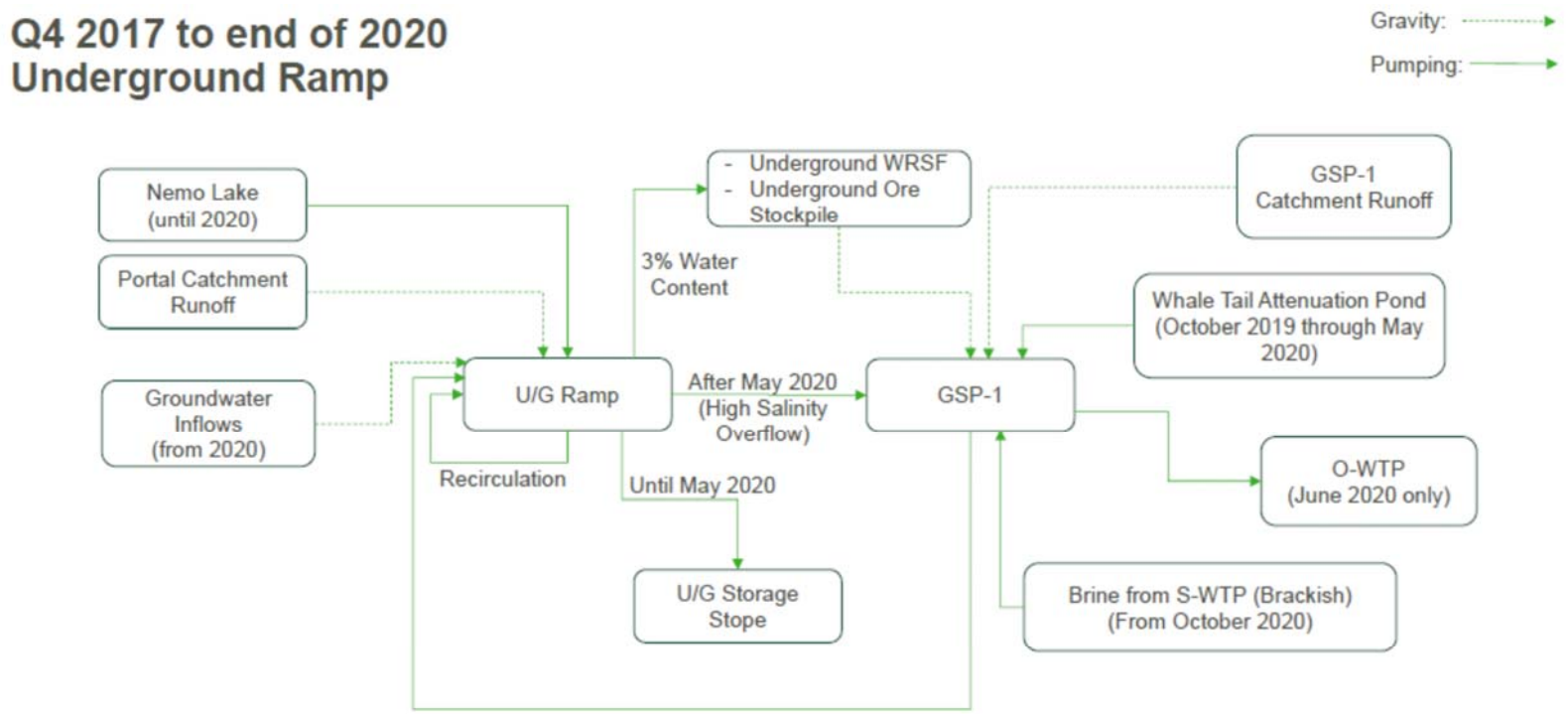


Figure B.9 Water Management Flowsheet during operations from May 2022 to the End of Operations (2025)



Water Management Concept:
-GSP-1 is the primary source of make-up water to feed the U/G Ramp. Nemo Lake is the secondary source.
-Overflow from the Underground Ramp is discharged to the Underground Stope until it is full. Once the stope is full, overflow reports to GSP-1 (High Salinity Pond) until mining breaks through the cryopeg
(estimated in April 2022)

Figure B.10 Water Management Flowsheet during Underground Operations from Q4 2019 to the End of 2020

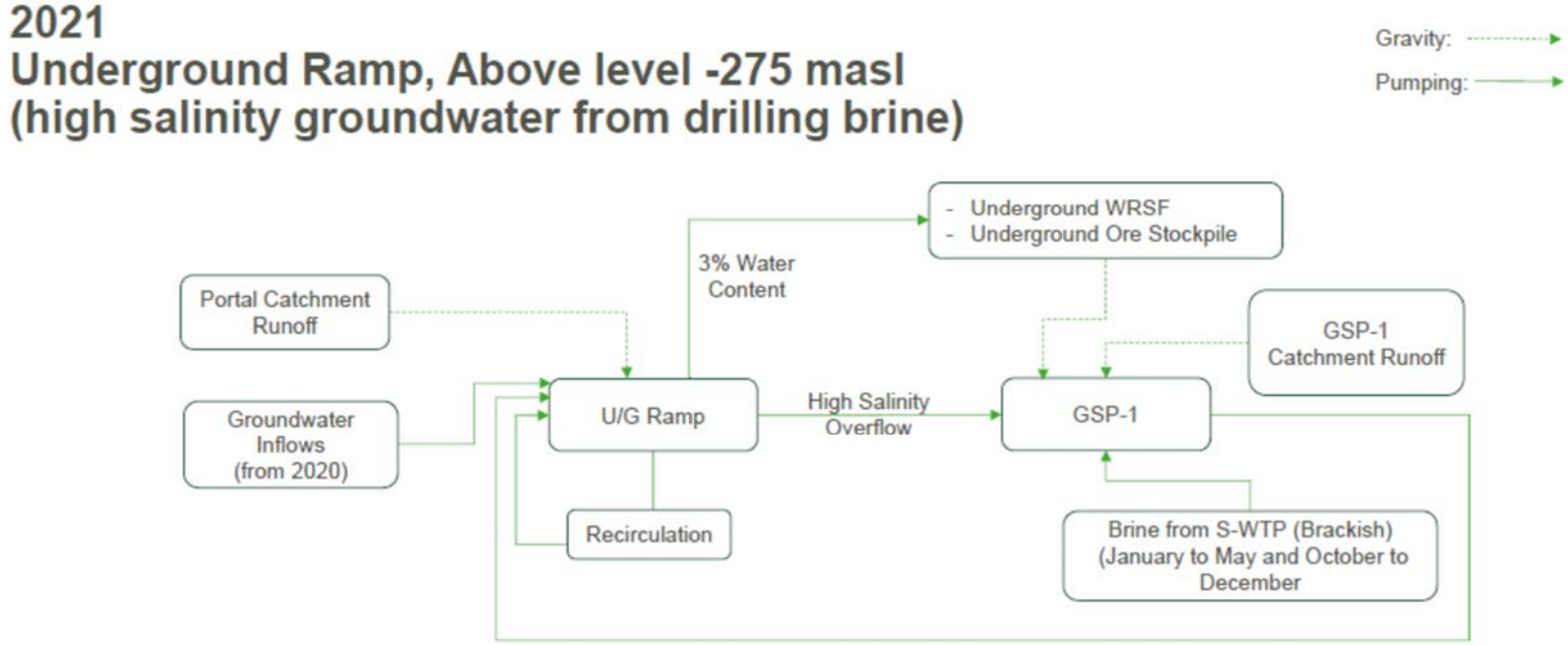


Figure B.11 Water Management Flowsheet during Underground Operations in 2021

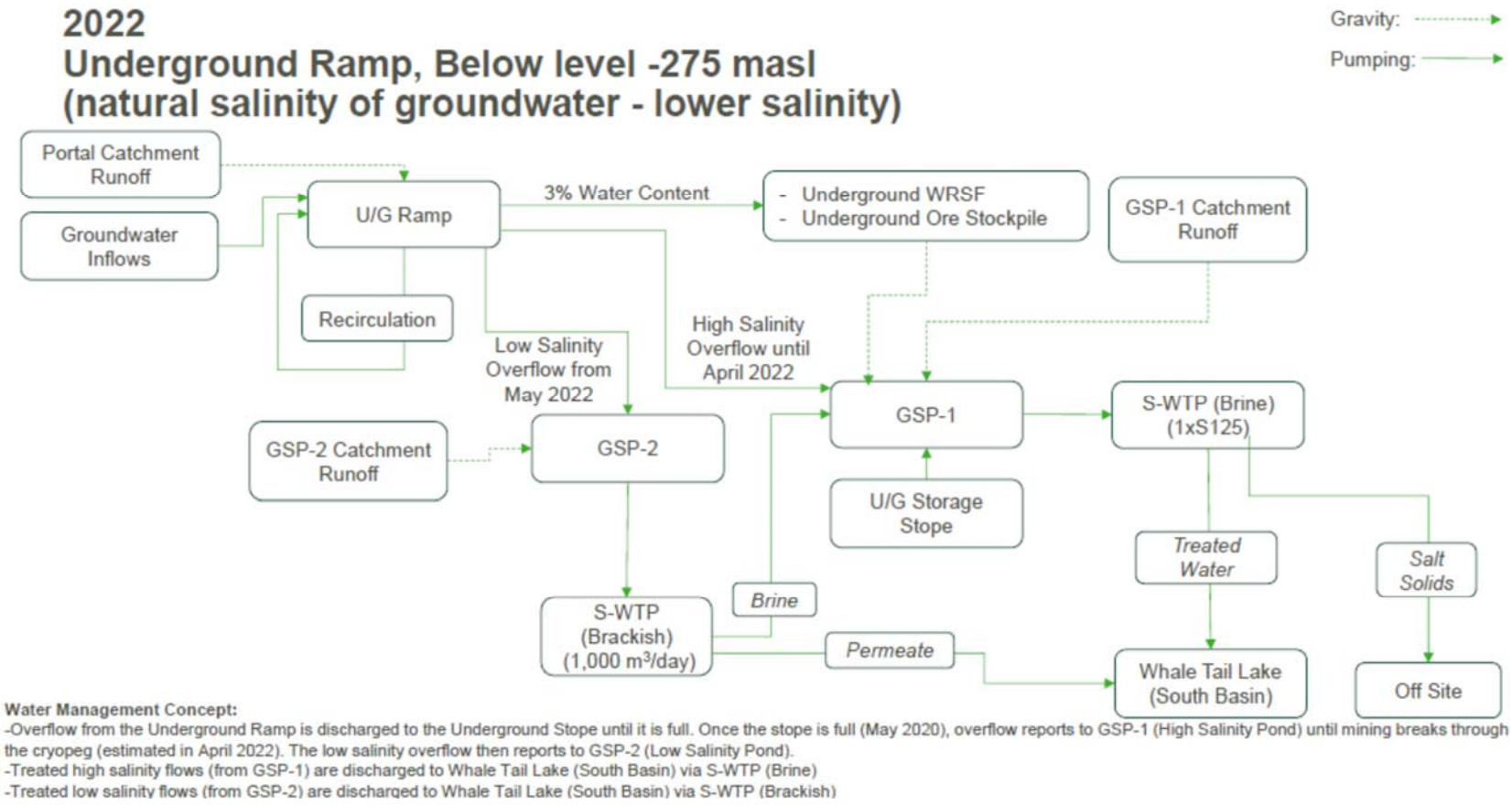


Figure B.12 Water Management Flowsheet during Underground Operations in 2022

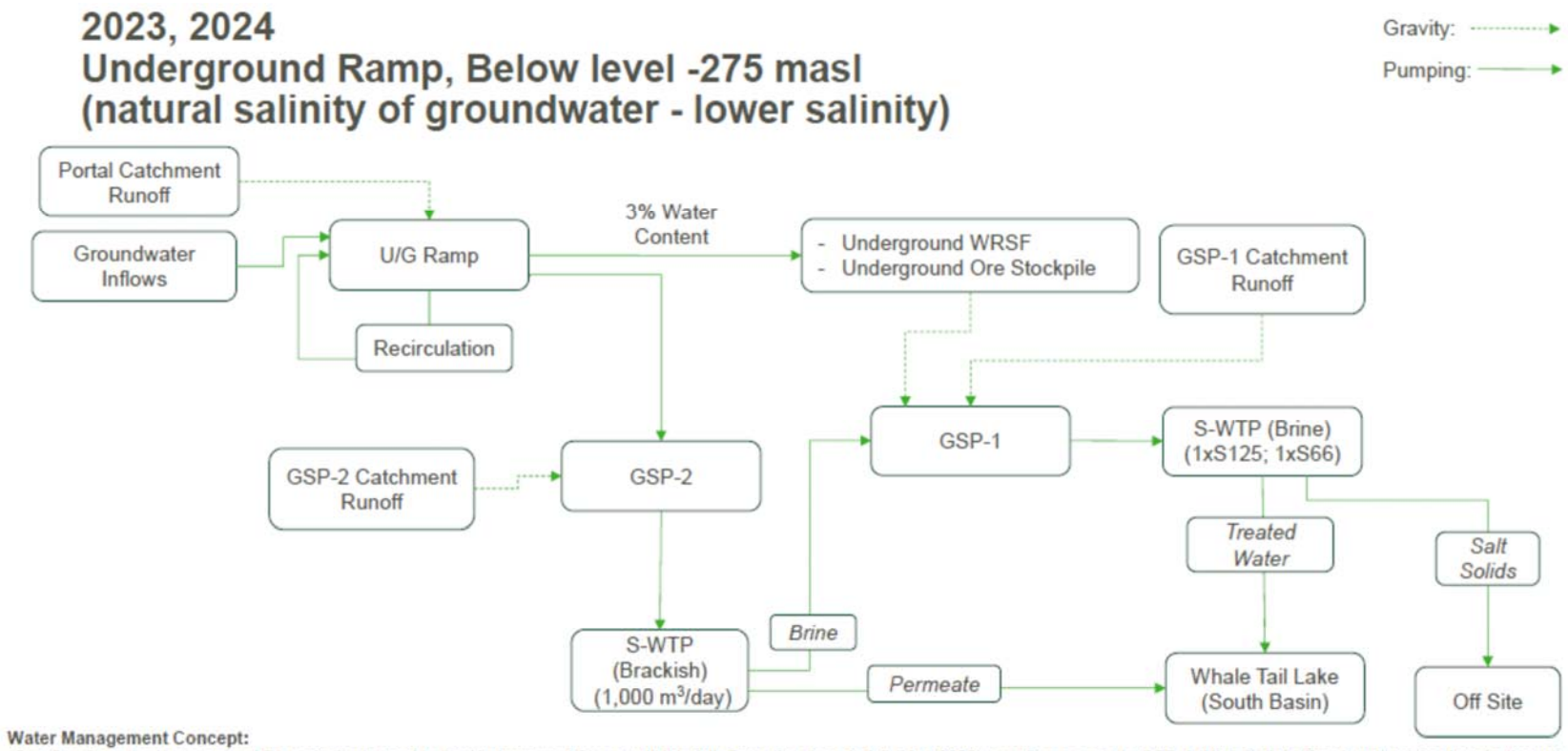


Figure B.13 Water Management Flowsheet during Underground Operations in 2023 and 2024

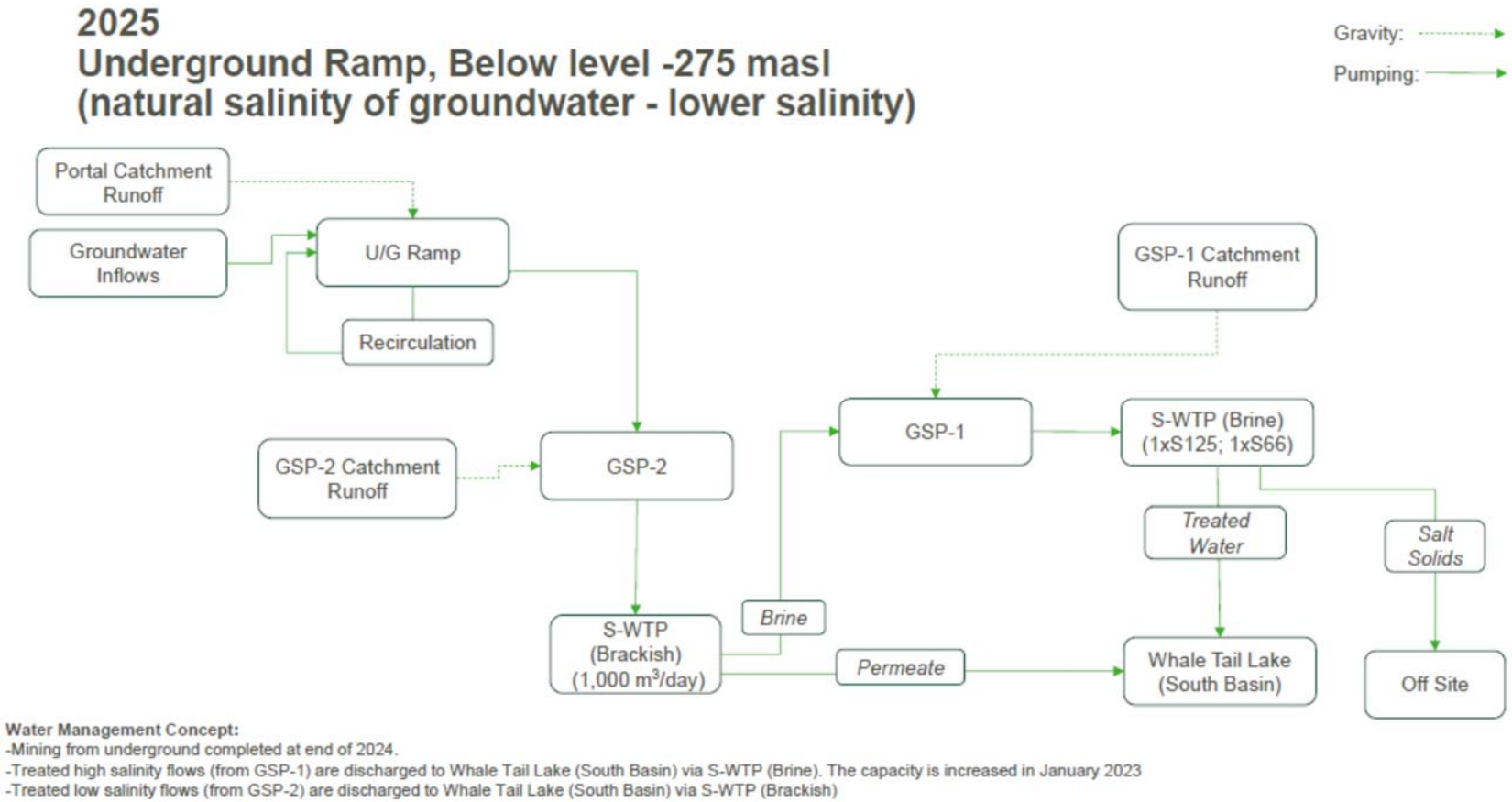


Figure B.14 Water Management Flowsheet during Underground Operations in 2025

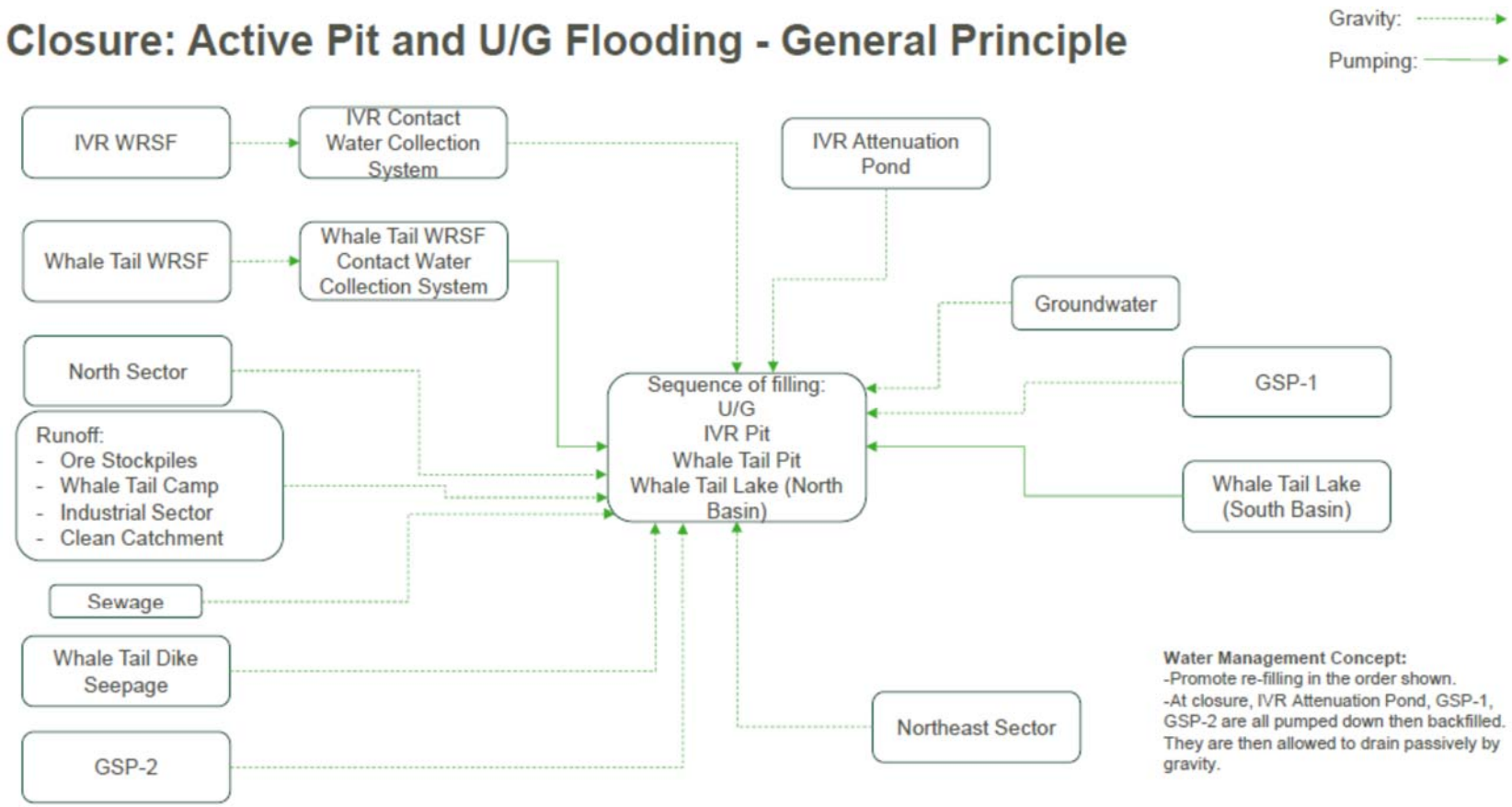


Figure B.15 Water Management Flowsheet during Closure (Active Pit and Underground flooding)

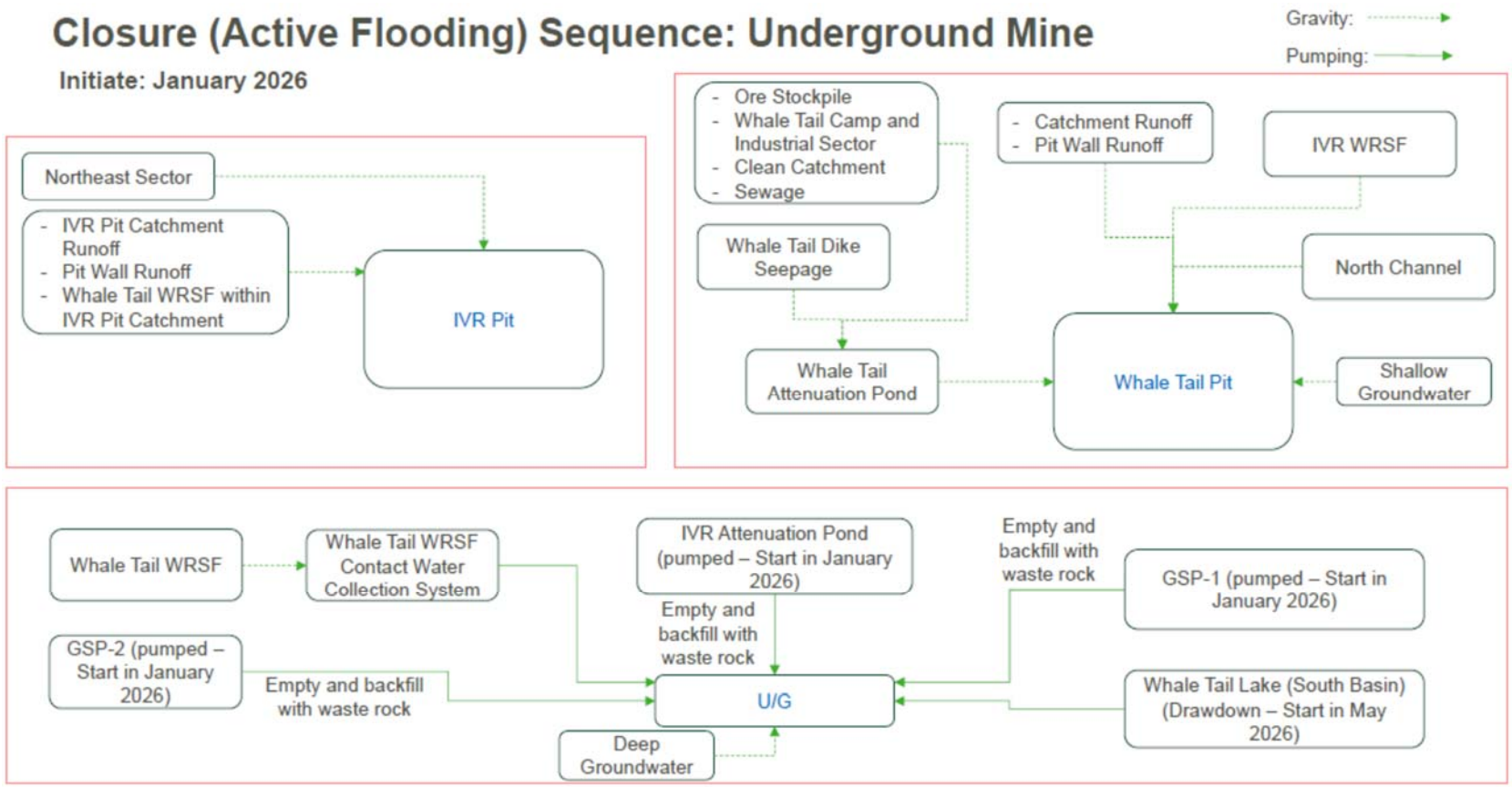


Figure B.16 Water Management Flowsheet during Closure (Active Flooding Underground Mine)

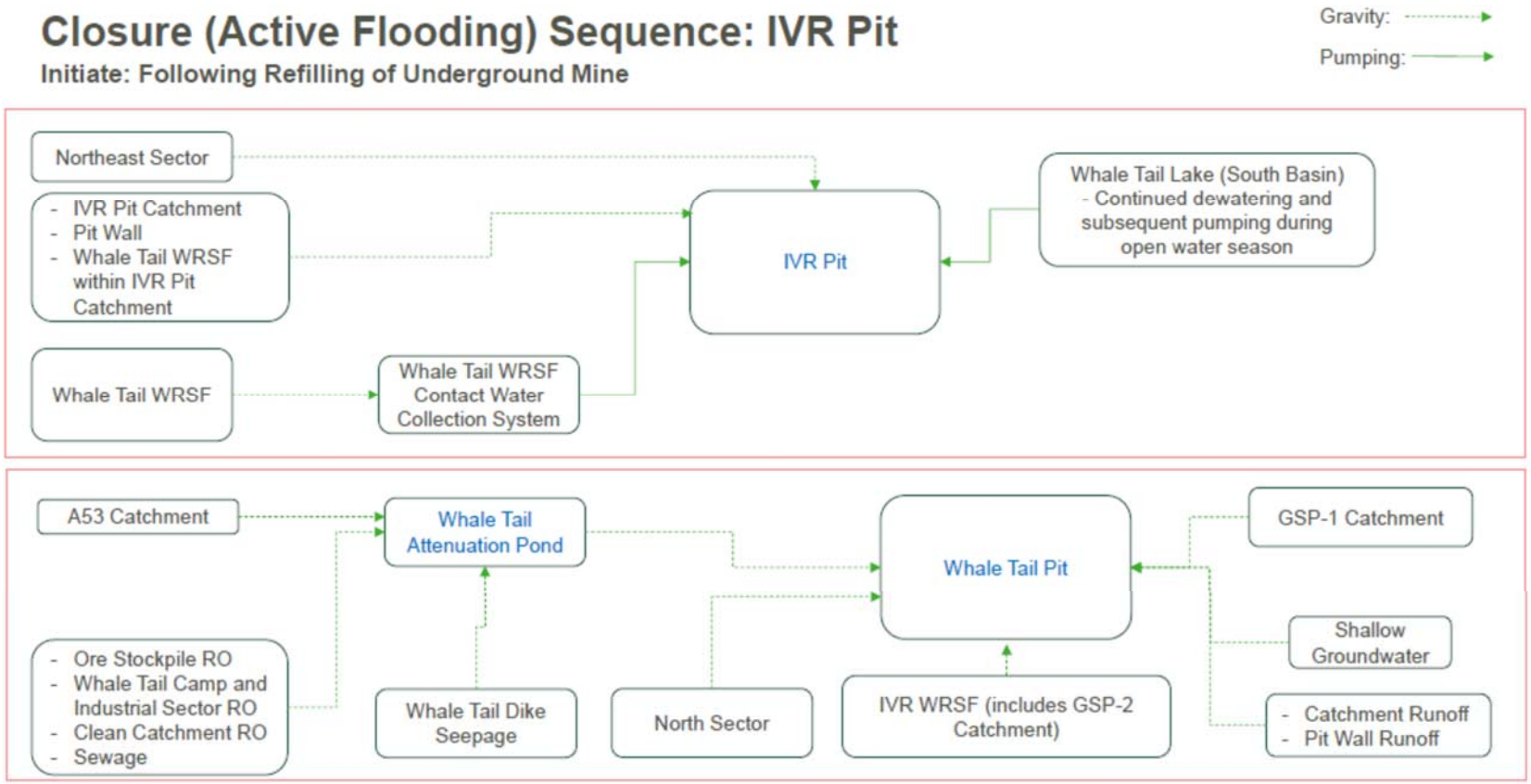


Figure B.17 Water Management Flowsheet during Closure (Active Flooding IVR Pit)

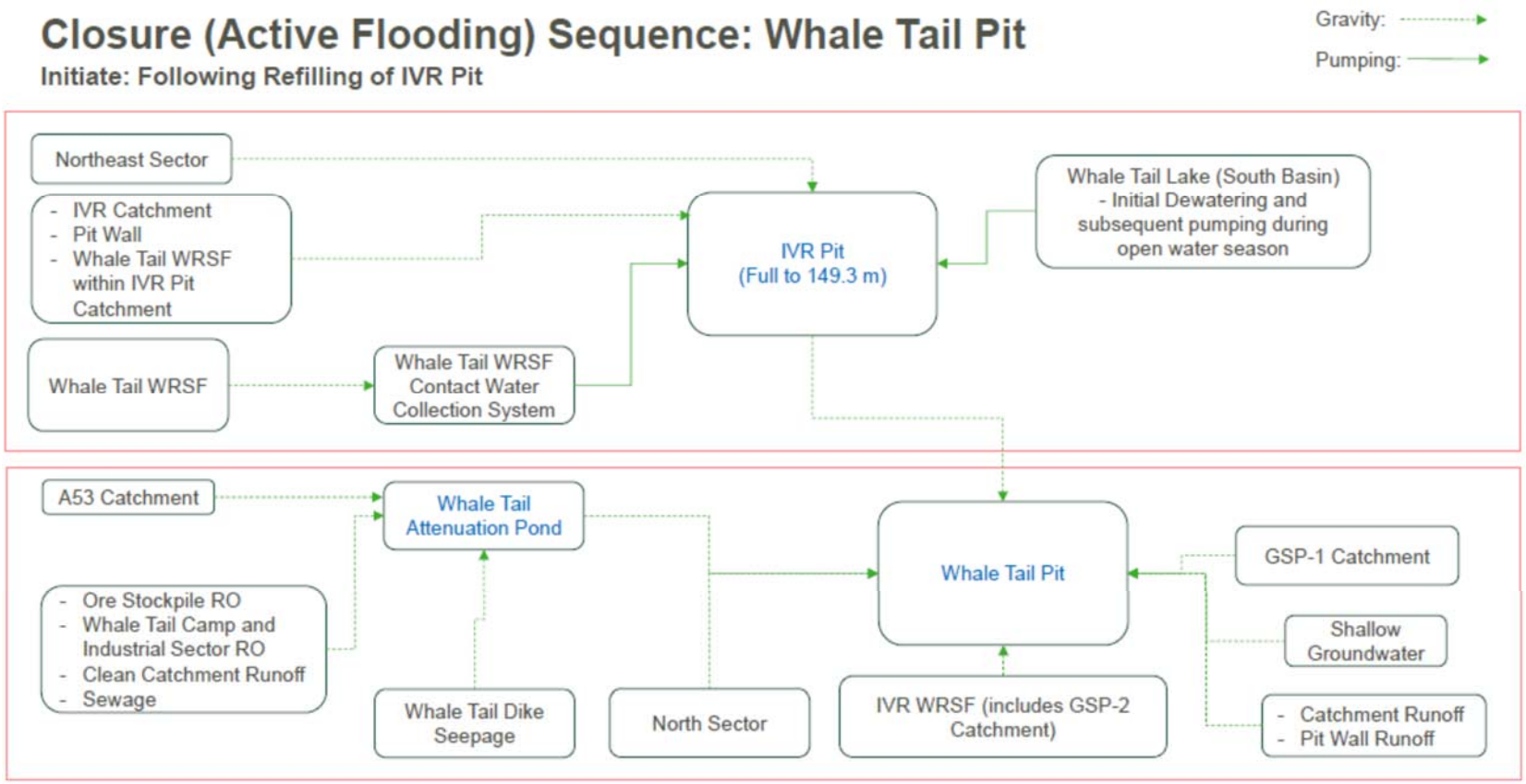


Figure B.18 Water Management Flowsheet during Closure (Active Flooding Whale Tail Pit)

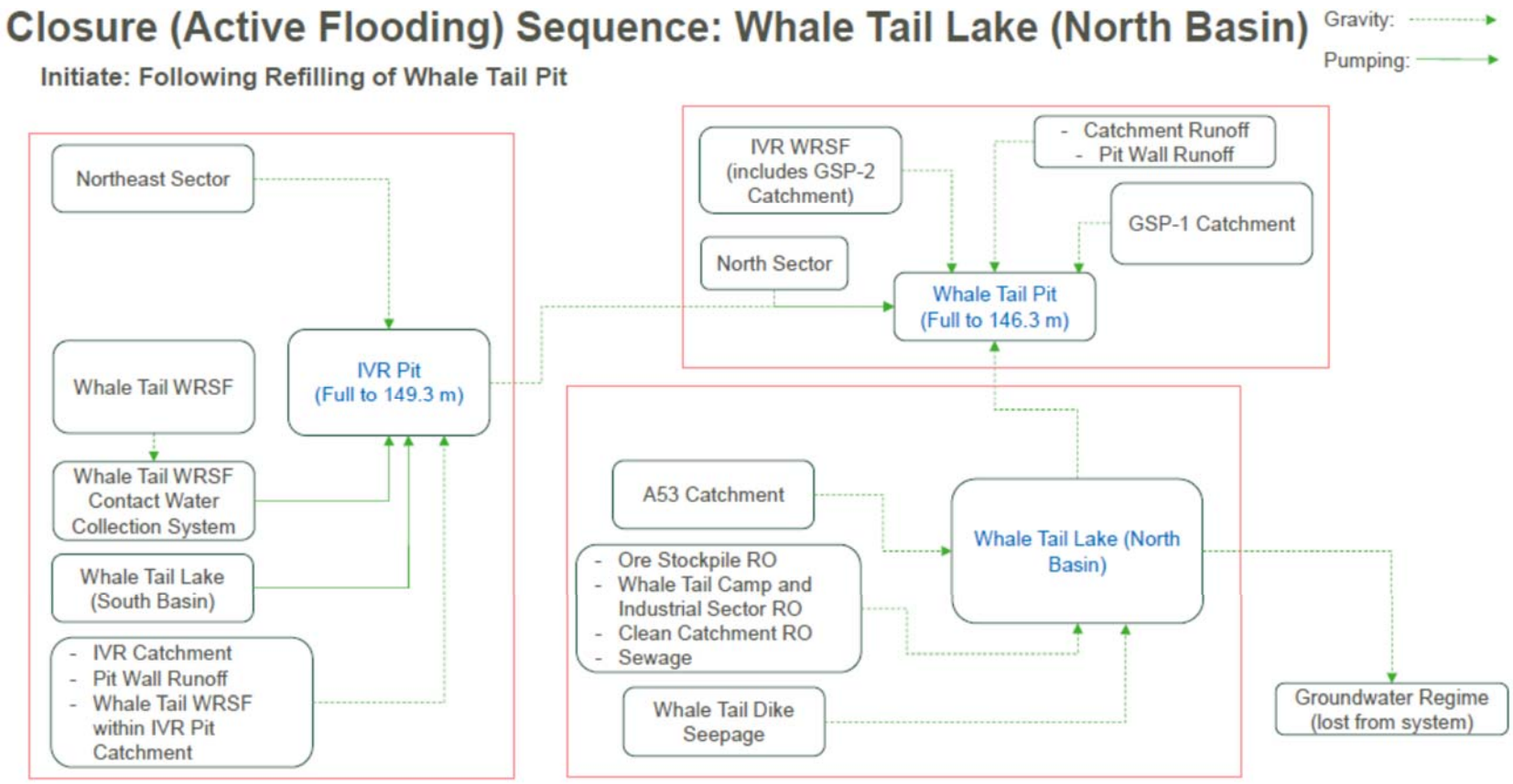


Figure B.19 Water Management Flowsheet during Closure (Active Flooding Whale Tail Lake/North Basin)

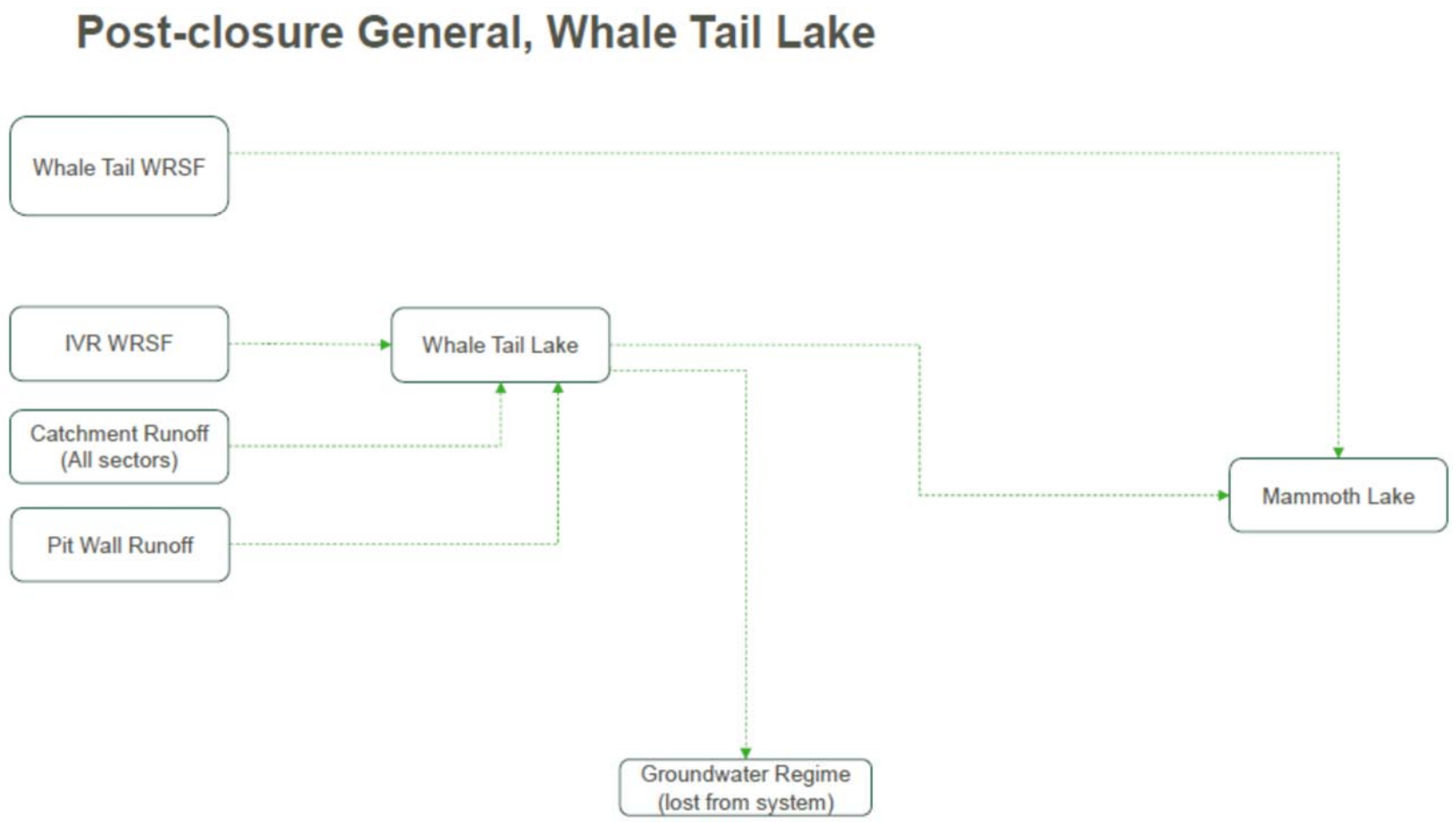


Figure B.20 Water Management Flowsheet during the Post-Closure (General Whale Tail Lake)

APPENDIX C • WHALE TAIL PIT - EXPANSION PROJECT MEAN ANNUAL WATER BALANCE

REPORT

Whale Tail Pit - Expansion Project

2019 Mean Annual Water Balance Update

Submitted to:

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Submitted by:

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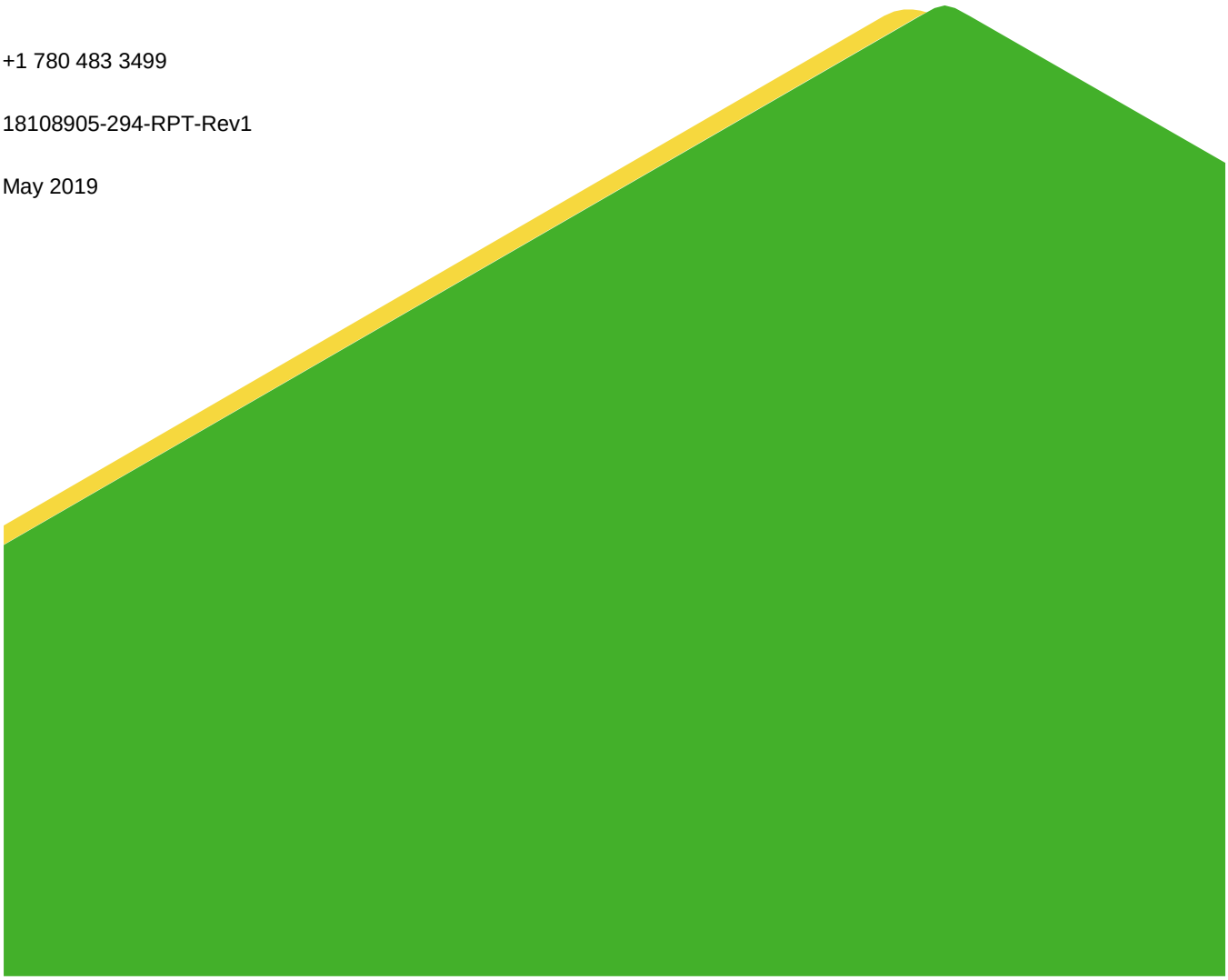
18108905-294-RPT-Rev1

May 2019



Distribution List

1 e-copy - Agnico Eagle Mines Limited

1 e-copy - Golder Associates Ltd.

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APPENDICES

1.0 INTRODUCTION

Agnico Eagle Mines Limited: Meadowbank Division (Agnico Eagle) is proposing to develop the Whale Tail Pit and the IVR Pit and underground operations on the Amaruq property (Project), in continuation of mine operations and milling of the Meadowbank Mine. The Amaruq Exploration property is a 408 square kilometre (km^2) site located on Inuit Owned Land approximately 150 kilometres (km) north of the hamlet of Baker Lake and approximately 50 km north of the Meadowbank Mine in the Kivalliq region of Nunavut.

The Approved Project supports mining an initial amount of approximately 8.3 million tonnes of ore from one open pit, the Whale Tail Pit, processed over a three to four-year mine life. The Expansion Project proposes mining of an additional 15.2 million tonnes of ore from the expanded Whale Tail Pit, the IVR open pit and underground operations, for a total ore tonnage of 23.5 million tonnes. A detailed Project Description, and water management plan describing water management facilities examined herein can be found in the Expansion Project's final environmental impact statement (FEIS) Addendum.

In 2018, Golder developed a mean annual water balance for the Expansion Project to support the FEIS Addendum (Golder 2018a). Since then, model inputs have been refined, as described in Section 4.0. This report presents an updated description of water management activities and modelled flows from the mean annual water balance for the Expansion Project. This water balance was developed through an iterative process of infrastructure design, pond sizing, flow management and forecast of corresponding water quality to achieve the goal of having workable and robust water flow and quality management at the mine which will minimize environmental impacts.

This report primarily focuses on the construction, operation, and closure phases of the Expansion Project. It is limited to catchments of the Project footprint and does not address the receiving environment within and downstream of the effluent discharge point.

Water quality predictions corresponding to the Expansion Project's mean annual water balance are presented under a separate cover (Golder 2019a).

This report is organized as follows:

- Section 2.0 provides a high-level summary of water management at the Project;
- Section 3.0 provides the basis of the water balance;
- Section 4.0 describes the changes to the mine plan that are presented in this update;
- Section 5.0 provides a description of water management activities, and results of the water balance by catchment; and
- Section 6.0 provides a list of risks and opportunities to be considered as the mine develops and is operated.

2.0 GENERAL WATER MANAGEMENT SUMMARY

The Expansion Project consists of mining from the Whale Tail and IVR Pits as well as from the underground operations. The ultimate Project general arrangement plan (2025) is shown in Figure 1, with the key water management features labelled. The main objectives pertaining to water management are to minimize contact water that must be managed and to limit the impact on the receiving environment. In developing the water management plan, the following principles were followed (Agnico Eagle 2018a):

- keep the different water types separated to the extent feasible;
- control and minimize contact water through diversion and containment;
- minimize freshwater consumption by recycling and reusing the contact and process water wherever feasible; and
- meet discharge criteria before any site contact water is released to the downstream environment.

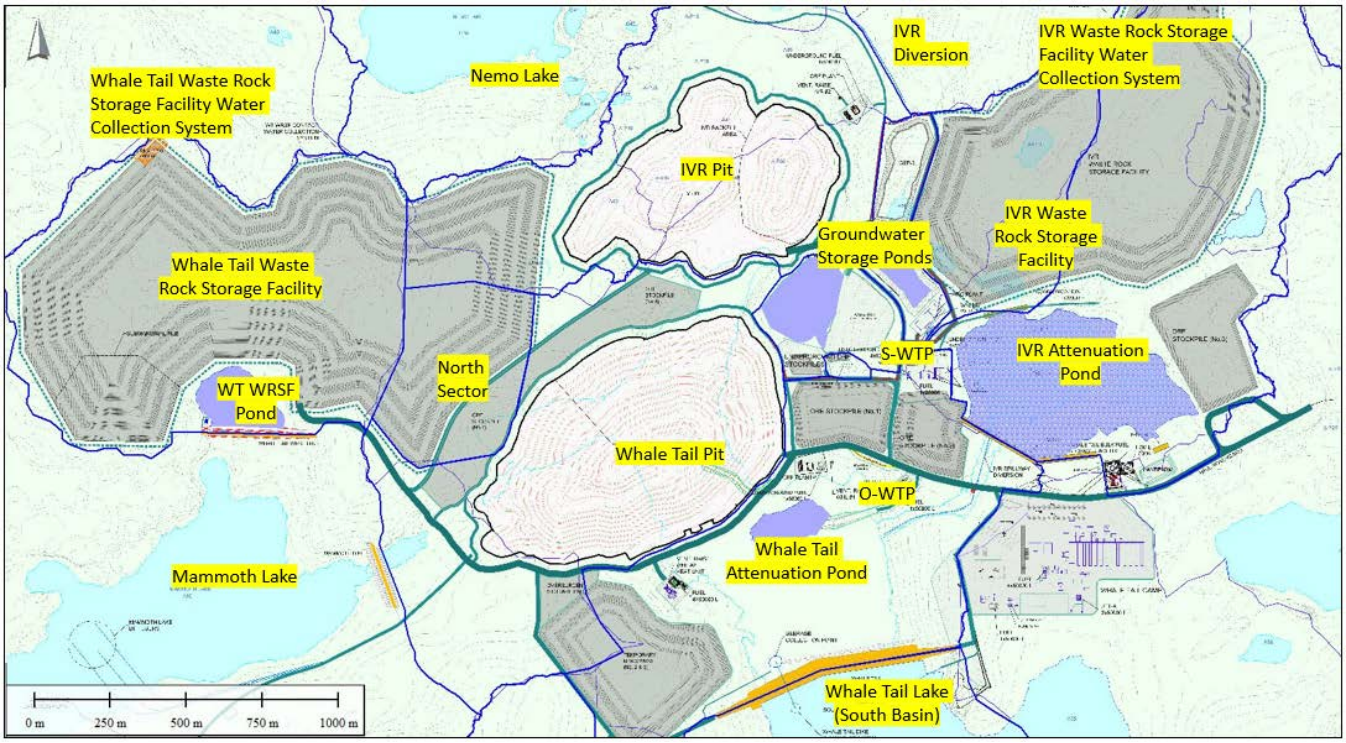

Figure 1: Water Management Facilities (2025)

2.1 Surface Water Management

Non-contact surface water is diverted and discharged directly into the environment without treatment.

Runoff from the surface facilities are collected in sumps or ponds around the Project and pumped to a central location before being treated and discharged directly or indirectly (i.e., through Whale Tail Lake (South Basin)) into Mammoth Lake. During construction, site contact water is collected in Quarry 1 prior to treatment. Once Whale Tail Lake (North Basin) is dewatered (2019), site contact water is collected in the Whale Tail Attenuation Pond until the IVR Attenuation Pond is operational in 2022, after which point contact water is collected in the IVR Attenuation Pond. Surface contact water is treated and discharged during the non-winter months (i.e. from June to September).

The operational surface water management plan is presented conceptually in flow diagrams in Appendix A and mine plan drawings are presented in Appendix B for the life of mine. Examples of these diagrams are shown in Figure 2 and Figure 3.

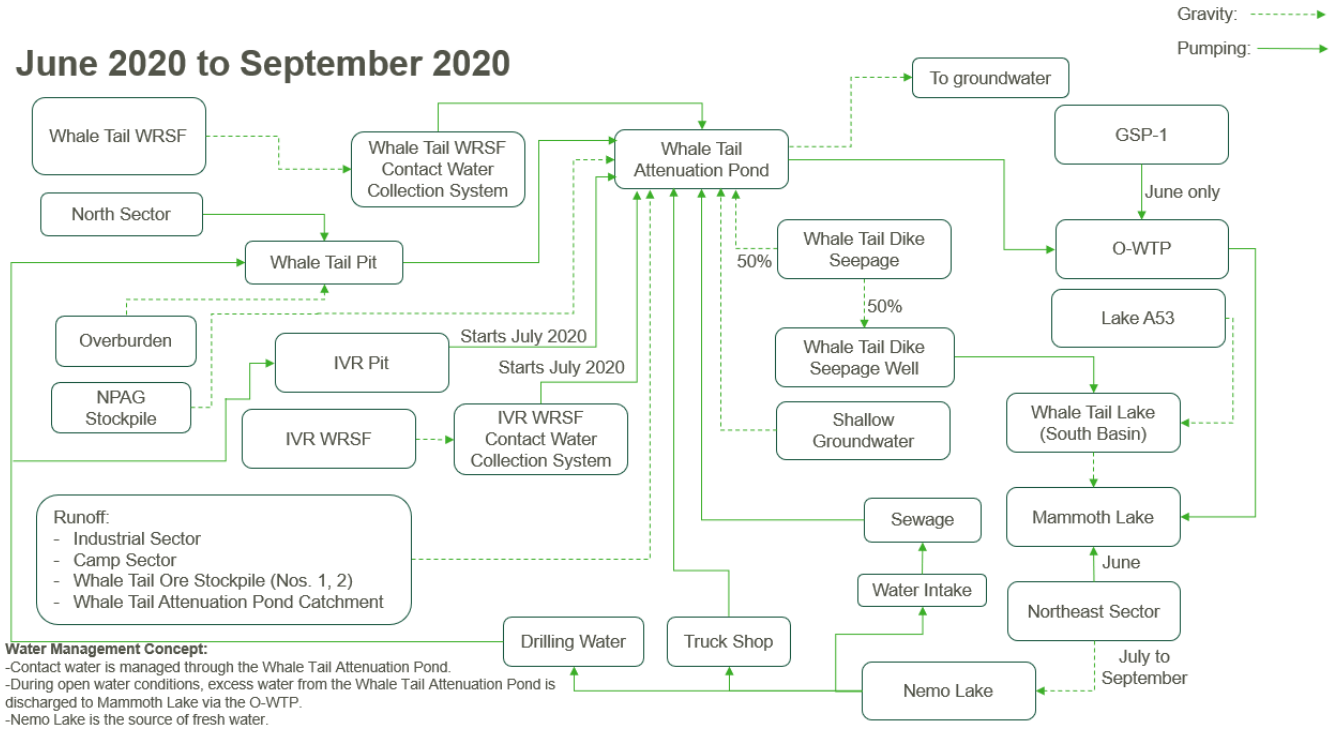

Figure 2: Conceptual Flow Diagram for Surface Waters – June 2021 to September 2021

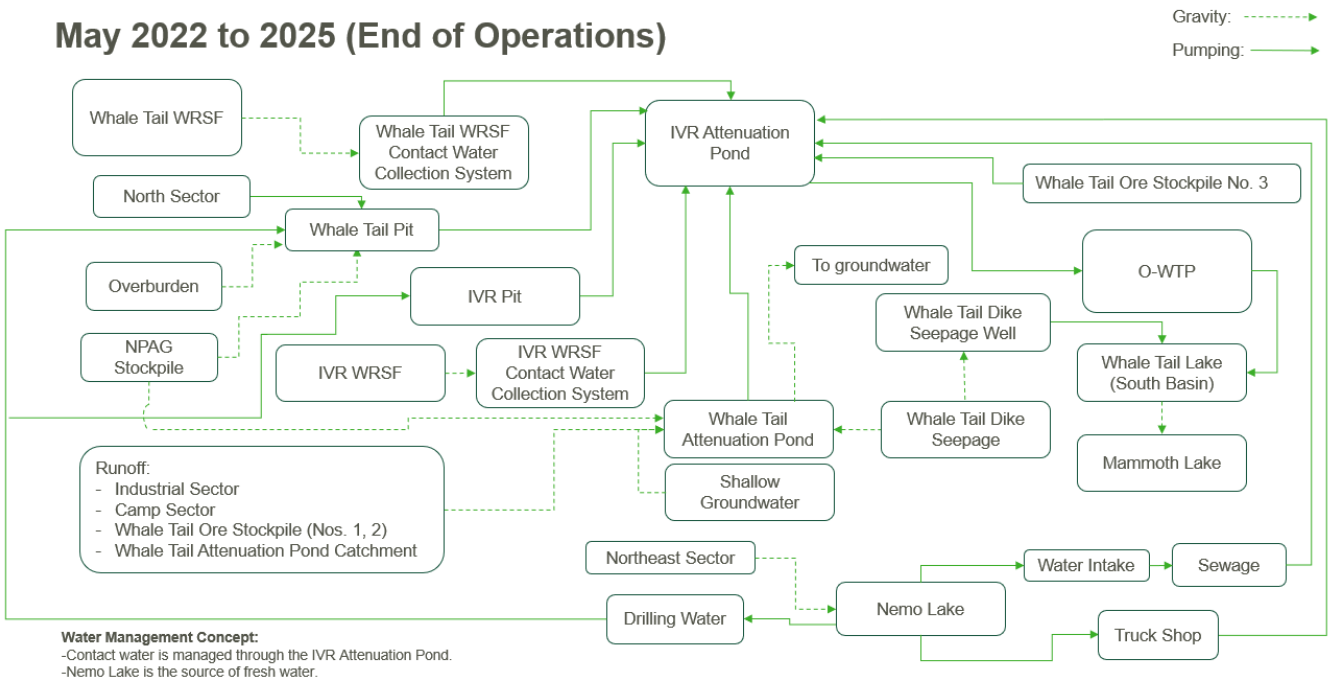

Figure 3: Conceptual Flow Diagram for Surface Waters – May 2022 to 2025 (End of Operations)

2.2 Underground Water Management

The underground operations results in saline water that must be treated. This water is isolated from the surface waters described in the previous section. The saline water is managed in Groundwater Storage Ponds (GSPs) and the underground stope. It is assumed that high and low salinity waters can be successfully isolated and managed and treated separately. High saline water is stored in either the underground stope or GSP-1 (described further in Section 5.2.1). From GSP-1, water is sent back underground as make-up water source for the underground operations. Excess water is treated in the S-WTP (brine) before discharge to the receiving environment. Low saline water is sent to GSP-2 before treatment in the S-WTP (brackish) prior to discharge to the receiving environment. Treatment and discharge of the underground contact water occurs year-round.

The operational underground water management plan is presented conceptually in flow diagrams for the life of mine in Appendix A. Examples of these diagrams for high and low salinity are in Figure 4 and Figure 5, respectively.

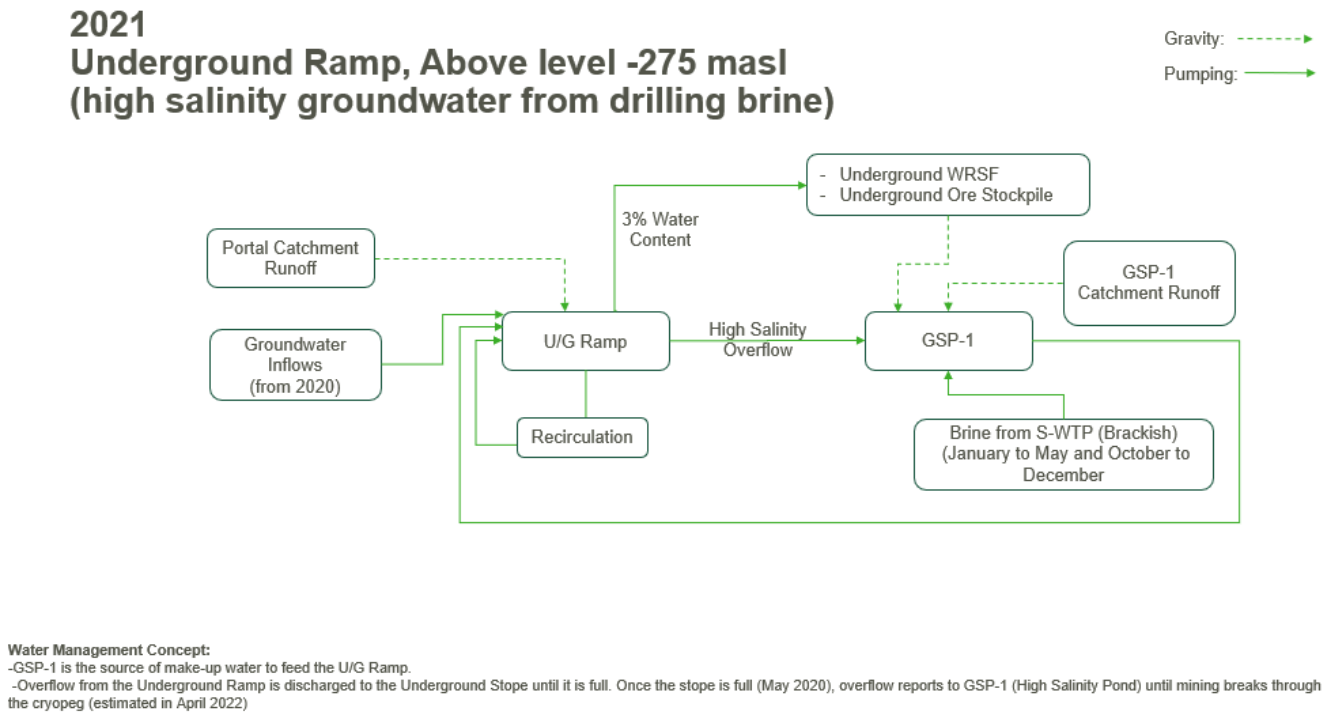

Figure 4: Conceptual Flow Diagram - Underground Ramp 2021, Shallower than Level -275 masl (High Salinity Groundwater from Drilling Brine)

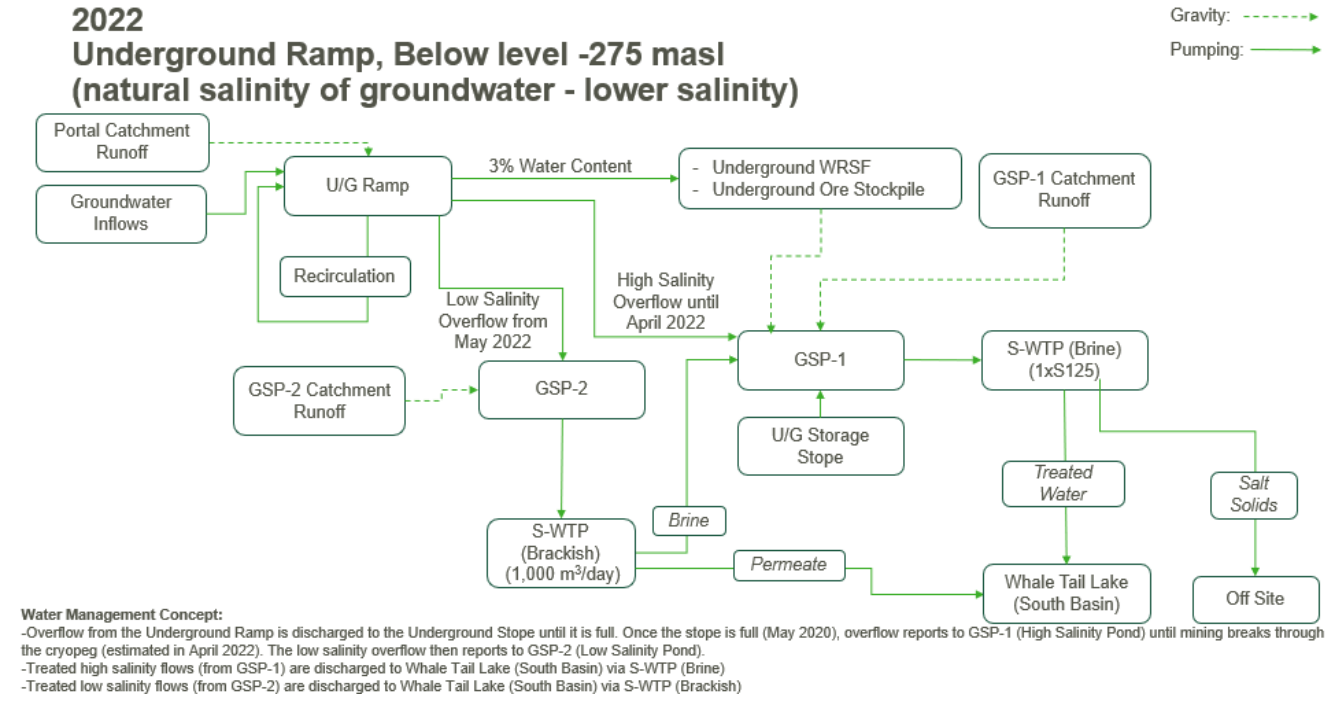

Figure 5: Conceptual Flow Diagram– Underground Ramp 2022 - Deeper than Level -275 masl (Natural Salinity of Groundwater – Lower Salinity)

3.0 WATER BALANCE BASIS

3.1 General

The mean annual water balance was derived in GoldSim® on a monthly timestep, in consideration of the following information:

- Site climate (Section 3.2);
- Mine plan (Section 3.3);
- Evolving catchments corresponding to the mine plan, derived based on watershed delineations provided for this update by SNC Lavalin (2019), with input from Golder, discretized by land and water areas;
- Evolving pit and underground mine elevation-area-storage characteristics (Agnico Eagle 2018b, available in Appendix C), derived from Project raster data provided by Agnico Eagle;
- Pond elevation-area-storage characteristics (Appendix D), derived from Project raster data provided by Agnico Eagle;
- Evolving groundwater inflows and infiltration derived by Golder for the Whale Tail open pit and the underground mine. Groundwater inputs are described in Section 3.5;
- Mine operation consumptive flows provided by Agnico Eagle (Section 3.4); and
- Waste rock cover runoff and seepage values as provided by O'Kane Consultants Inc (OKC; Appendix E).

3.2 Climate Input

Water balance results presented herein were based on mean annual climate input summarized in Table 1, consistent with previous studies (Agnico Eagle 2016b). Thus, results presented herein are expected to vary from predicted under wet or dry conditions.

Precipitation presented in Table 1 was applied in water balance calculations as follows:

- Precipitation was adjusted for undercatch using a factor of 1.15 for rainfall, and 1.55 for snowfall following previous studies (Agnico Eagle 2016c);
- Frozen conditions were assumed from October to May;
- Rainfall during frozen conditions, as defined above, was applied as rainfall during the month of June of the same year if fallen between the months of January and May inclusively, or during the month of June of the following year if fallen between the months of October and December inclusively;
- Snowfall outside of frozen conditions, as defined above, was applied as rainfall during the same month; and,
- Infiltration losses were assumed to be negligible in natural areas based on permafrost conditions.

Table 1: Climate Input for Mean Year

Month	Mean Air Temperature (°C)	Precipitation (mm)		Losses (mm)		
		Rainfall	Snow-Water Equivalent	Lake Evaporation	Evapo-transpiration	Sublimation
January	-31.3	0.0	6.9	0	0	9
February	-31.1	0.0	6.2	0	0	9
March	-26.3	0.0	9.1	0	0	9
April	-17.0	0.4	13.3	0	0	9
May	-6.4	5.2	8.1	0	0	9
June	4.9	18.1	3.0	9	3	0
July	11.6	38.5	0.0	99	32	0
August	9.8	42.1	0.6	100	32	0
September	3.1	34.7	6.8	40	13	0
October	-6.5	6.4	22.4	0	0	9
November	-19.3	0.2	16.6	0	0	9
December	-26.8	0.0	10.0	0	0	9
Annual	-11.3	145.7	103.0	248	80	72

3.3 Mine Plan

Water management facilities are presented on Figure 1, representative of end of mine life largest footprint conditions (2025). Conceptual flow diagrams are presented in Appendix A and the mine plan drawings are presented in Appendix B for the entire life of mine. Milestones relevant to the mean annual water balance are summarized in chronological order below:

- Quarry 1 is initiated in 2017 (i.e., prior to the start of the water balance in January 2018).
- Underground Mine is initiated in 2017 (i.e., prior to the start of the water balance).
- GSP-1 is initiated in 2017 (i.e., prior to the start of the water balance).
- The Whale Tail Dike is initiated in June 2018 and was assumed to retain upstream flows starting in July 2018.
- The Starter Pit is initiated in July 2018.
- The Whale Tail waste rock storage facility (WRSF) Dike is initiated in October 2018 and retains upstream flows starting in freshet 2019.
- The Mammoth Dike is initiated in November 2018 and retains upstream flows starting in freshet 2019.
- The first phase of dewatering of Whale Tail Lake (North Basin) is initiated in March 2019 for approximately 45 days. About 2 million cubic meters (m^3) is dewatered and discharged to Whale Tail Lake (South Basin) during this phase.
- The second phase of dewatering starts in June 2019. About 1.1 m^3 is dewatered and discharged to Whale Tail Lake (South Basin) during this phase.

- The Northeast Dike is initiated in January 2019 and retains upstream flows starting in freshet 2019. It is decommissioned prior to the initiation of the IVR Pit.
- The Operational Water Treatment Plant (O-WTP) - arsenic (As) and total suspended solids (TSS) treatment unit - comes online in March 2019.
- The North Sector collection area is operational starting in June 2019 until closure.
- The East Channel is initiated in September 2019 and completed in November 2019. It diverts upstream flows starting in freshet 2020.
- The Whale Tail Dike Seepage Collection System is operational by January 2020.
- The IVR Pit is initiated by July 2020.
- The IVR Diversion is operational from July 2020 until closure.
- The IVR WRSF is operational from July 2020 until closure.
- The water treatment unit for low total dissolved solids (TDS) water or S-WTP (brackish) becomes available by October 2020.
- The water treatment unit for high TDS water, or S-WTP (brine) becomes available by April 2022; its capacity is increased in January 2023.
- GSP-2 becomes operational by April 2022.
- Drawdown of Lake A53 occurs prior to freshet 2022.
- The IVR Attenuation Pond (i.e., ex-Lake A53) is operational by freshet 2022.
- Construction of Mammoth sill and spillway is completed after January 2026 to maintain the flooded pit lake water elevation at 153.5 metres above sea level (masl) at closure and post-closure.
- Closure is initiated in January 2026 and active and passive flooding occurs until Whale Tail Lake (North Basin) is refilled to overtop the Mammoth Lake sill and spillway to 153.5 masl by 2042).
- Post-closure reconnection of Whale Tail Lake (North Basin) with Whale Tail Lake (South Basin) by decommissioning of the Whale Tail Dike, Mammoth Dike and Whale Tail WRSF Dike. This occurs once the flooding has reached 153.5 masl and the quality of the flooded pit lake is acceptable to fish and fish habitat (estimated by 2042).

The schedule for construction of the third GSP is adaptive, depending on need.

3.4 Consumptive Flows

Consumptive flows were provided by Agnico Eagle as follows:

- Camp use:
  - 77.8 m^3/day from January 2018 to December 2020. This increases to 192 m^3/day from January 2021 to the end of operations;
    - Sourced from Whale Tail Lake (South Basin) until the end of August 2018; and
    - Sourced from Lake C38 (Nemo Lake) from September 2018 to the end of operations.
  - 12.0 m^3/day during closure, sourced from Whale Tail Lake (South Basin).
- Truck shop:
  - 103.1 m^3/day from January 2018 to the end of operations.
- Drilling water for open pits:
  - 48.0 m^3/day from the initiation of the Whale Tail Pit to December 2018;
  - 24.0 m^3/day from January 2019 to June 2019; and
  - 48.0 m^3/day from July 2019 to the end of operations.
- The water intake from Mammoth Lake for the emulsion plant is estimated to be approximately 2.9 m^3/day, or 1,060 m^3/year. This volume is considered to be negligible and was not considered in the Project's water balance.
- Dust control was not considered in the Project's water balance given that its volume is expected to be fully lost to evaporation without runoff generation to Project storages. This approach is consistent with guidance from Agnico Eagle.
- 1% of the ore's weight trucked from the open pits to the Meadowbank mine was assumed to be saturated, as advised by Agnico Eagle.
- 3% of the waste rock's weight from the Underground Mine was assumed to be water, as advised by Agnico Eagle.

3.5 Hydrogeological Inputs

A numerical groundwater model was developed for the Expansion Project (Golder 2019b) and included two sets of predictions based on two scenarios:

- The Base Case: this scenario represents the best estimate of groundwater inflows and TDS based on the measured data.
- The Environmental Assessment (EA) Case: this scenario represents a more conservative, yet reasonable, scenario than the Base Case. This case was used for the water balance.

Table 2 and Table 3 present a summary of the groundwater inflows to the mine development areas during dewatering and mining for the Base Case and EA Case. Groundwater inflow to the IVR Pit during mining is not included as the pit is in permafrost (groundwater inflow is negligible).

The predicted inflows for the Whale Tail Pit, the Whale Tail Attenuation Pond and Whale Tail Lake (North Basin) are slightly greater (under 2%) under the EA Case than under the Base Case. The predicted inflows for the Underground Mine are approximately 2 to 3 times greater under the EA Case than for the Base Case.

The EA Case was used over the Base Case in the water balance, affecting the water balance as follows:

- No change in groundwater flow to the Whale Tail Attenuation Pond/Whale Tail Lake (North Basin);
- An increase in the outflow from the Attenuation Pond/ North Basin of up to 1%;
- An increase in inflows to GSPs for treatment.

Table 2: Predicted Groundwater Inflow during Dewatering and Mining - Whale Tail Pit and Underground

Phase	Time Period	Whale Tail Pit Groundwater Inflow (m^3/day)			Underground Groundwater Inflow (m^3/day)		
		Base Case	EA Case	Percent Increase	Base Case	EA Case	Percent Increase
Lake Dewatering	March-July 2019	NA	NA	NA	NA	NA	NA
Mining	August-December 2019[1]	970	970	0.0%	NA	NA	NA
	2020	1160	1170	0.9%	20	60	200%
	2021	1310	1320	0.8%	30	70	133%
	2022	1340	1360	1.5%	110	250	127%
	2023	1340	1360	1.5%	180	420	133%
	2024	1340	1350	0.7%	170	410	141%
	2025	1340	1350	0.7%	130	340	162%

Notes:
[1] Mining prior to Q4 2019 is within permafrost and groundwater inflow is negligible.
NA = not applicable; % = percent

Table 3: Predicted Groundwater Inflow during Dewatering and Mining - Whale Tail Attenuation Pond and Whale Tail Lake (North Basin)

Phase	Time Period	Whale Tail Attenuation Pond Groundwater Inflow (m^3/day)			Whale Tail Attenuation Pond Outflow (m^3/day)			Whale Tail Lake (North Basin) Groundwater Inflow (m^3/day)		
		Base Case	EA Case	Percent Increase	Base Case	EA Case	Percent Increase	Base Case	EA Case	Percent Increase
Dewatering	Match-August 2019	NA	NA	NA	NA	NA	NA	1320	1330	NA
Mining	August-December 2019	350	350	0%	180	180	0.0%	650	650	0%
	2020	120	120	0%	860	860	0.0%	720	720	0%
	2021	90	90	0%	1040	1050	1.0%	730	730	0%
	2022	90	90	0%	1080	1090	0.9%	720	720	0%
	2023	90	90	0%	1080	1090	0.9%	720	720	0%
	2024	90	90	0%	1080	1090	0.9%	720	720	0%
	2025	90	90	0%	1080	1090	0.9%	720	720	0%

Notes:

[1] Predictions of groundwater inflow to North Basin of Whale Tail lake represents the discharge of groundwater to the lake basin during dewatering and mining. This excludes discharges to the pit and Whale Tail Attenuation Pond, which are within the North Basin of Whale Tail Lake.

NA = not applicable, % = percent

Table 4 and Table 5 present a summary of the updated predicted Base Case and EA Case groundwater flow rates to the mine development areas during reflooding at closure. Groundwater inflow to/from the IVR Pit during mining is not included as the pit is in permafrost (groundwater inflow is negligible).

The groundwater inflows to Whale Tail Pit at closure are initially up to 100% higher in the EA case, with the disparity shrinking gradually until 2037, when the EA Case groundwater inflows equal the base case. The groundwater inflows to the Whale Tail Attenuation Pond range from 3% higher to 6% lower than for the Base Case. The net groundwater outflow from the Whale Tail Lake (North Basin) ranges -1% and 1% of the Base Case values. EA Case groundwater flows to the underground range from inflows up to 7 times higher, to outflows up to 1.5 times lower than for the Base Case.

Table 4: Predicted Groundwater Inflow during Closure - Whale Tail Pit, Whale Tail Attenuation Pond and Whale Tail Lake (North Basin)

Phase	Time Period	Whale Tail Pit Groundwater Inflow/Outflow (m^3/day)			Whale Tail Attenuation Pond Groundwater Inflow (m^3/day)			Whale Tail Lake (North Basin) Net Groundwater Discharge to Surface (m^3/day)		
		Base Case	EA Case	Percent Increase	Base Case	EA Case	Percent Increase	Base Case	EA Case	Percent Increase
Flooding	2026	NA	NA	NA	145	150	3%	340	345	1%
	2027	NA	NA	NA	170	170	0%	340	345	1%
	2028	NA	NA	NA	180	180	0%	345	345	0%
	2029	NA	NA	NA	185	180	-3%	345	345	0%
	2030	10	20	100%	190	185	-3%	345	345	0%
	2031	60	90	50%	180	170	-6%	345	345	0%
	2032	90	130	44%	170	160	-6%	345	340	-1%
	2033	120	170	42%	160	150	-6%	340	340	0%
	2034	130	170	31%	155	145	-6%	340	335	-1%
	2035	700	730	4%	125	120	-4%	330	330	0%
	2036	1160	1170	1%	85	85	0%	300	300	0%
	2037	910	910	0%	90	90	0%	300	300	0%
	2038	360	360	0%	115	115	0%	315	315	0%
	2039	-30	-30	0%	70	70	0%	370	370	0%
	2040	-10	-10	0%	0	0	0%	155	155	0%
	2041	0	0 to -5	0%	0	0	0%	-10	-10	0%

Notes:
Positive values indicate flow to the pit/pond and negative values indicate flow to bedrock.
NA = not applicable; % = percent

Table 5: Predicted Groundwater Inflow during Closure - Underground

Phase	Time Period	Underground Net Groundwater Inflow/Outflow (m^3/day)		
		Base Case	EA Case	Percent Increase
Flooding	2026	-30	10	133%
	2027	<-5	30	700%
	2028	<-5	20	500%
	2029	<-5	10	300%
	2030	<-5	10	300%
	2031	<-5	5	200%
	2032	<-5	5	200%
	2033	-5	-5	0%
	2034	-10	-5	50%
	2035	-10	-10	0%
	2036	-10	-15	-50%
	2037	-10	-20	-100%
	2038	-25	-35	-40%
	2039	-15	-25	-67%
	2040	-10	-25	-150%
	2041	-10	-20	-100%

Notes:
Positive values indicate flow to the pit/pond and negative values indicate flow to bedrock.
NA = not applicable; % = percent

4.0 UPDATES TO THE WATER BALANCE

Since the submission of the water balance report in support of the Expansion Project FEIS Addendum (Golder 2018a), several inputs to the water balance have been refined:

- Updated Project layout (Appendix B) and watershed areas. Differences can be attributed to the following:
  - Change in the location of ore, overburden and non-potentially acid generating (NPAG) stockpiles;
  - Updated Whale Tale WRSF Dike alignment provided by SNC Lavalin (2019), with input from Golder;
  - Updated watershed areas delineations provided by SNC Lavalin (2019), with input from Golder; and
  - Updates to the GSP footprints.

Table 6 compares the areas from the FEIS Addendum water balance Golder (2018a) and the updated water balance.

- Runoff and seepage from the WRSFs:

  Previously, runoff from the WRSFs was conservatively estimated as 50% and 70% of rainfall/snowmelt during operations and closure, respectively. Seepage was estimated as the overflow from the stockpile once the retention capacity (assumed to be up to 5% water by mass) has been reached. However, OKC has since performed hydrological modelling and updated the water balances for the Whale Tail and IVR WRSFs. A draft memorandum of the hydrological modelling results is available in Appendix E and is summarized here.

  OKC performed hydrological modelling to assist in developing the expected seasonal active layer thickness for the Whale Tail and IVR WRSFs. As a part of this study, estimates of runoff, interflow and basal seepage rates for the WRSF were developed. The results of the surface water balance for the WRSFs indicate that the hydrologic regimes are expected to be different for the north and south aspects of the WRSFs and for bare waste rock versus the cover system. However, the general runoff for the WRSFs can be summarized as a percentage of annual presentation. Runoff from the WRSF is an average of 5% of annual precipitation, with the majority of runoff (4%) occurring as a result of spring melt. For the purposes of the water balance presented in this report, this annual runoff is constant in operations and closure as the model results assume no change in runoff due to the placement of the closure cover.

  The OKC modelling indicates a high infiltration capacity. As water infiltrates into the surficial materials, it eventually freezes at depth. The base layer of the WRSF is predicted to be consistently frozen from the time of placement. As a result, basal seepage from the WRSFs is negligible.

- Dewatering schedule:

  The dewatering schedule has been modified slightly. Where previously the dewatering to Whale Tail Lake (South Basin) was assumed to occur between March and June 2019, the schedule has been split into two phases: Phase 1 is initiated in March 2019 for approximately 45 days; Phase 2 starts in June 2019.

- Treatment:

  The O-WTP is available starting in March 2019 instead of June 2019.

- Consumptive Flows:

  To accommodate increased camp capacity during operations, Camp water use now increases from 77.8 m^3/day to 192 m^3/day from January 2021 to the end of operations.

- Hydrogeological inputs:

  The groundwater model inputs are based on the latest EA Case hydrogeological predictions presented in Golder 2019b). A summary of the hydrogeological predictions is presented in Section 3.5. The updated groundwater flows for the Whale Tail Pit range from 1% - 15% lower than predicted for the Expansion Project FEIS Addendum. Groundwater to the underground is 14% to 21% lower. Groundwater flows to the Whale Tail Attenuation Pond and Whale Tail Lake (North Basin) remain unchanged.

The impacts of these modifications on the water balance are highlighted in the relevant sections of this report.

Table 6: Change in Facility Watershed Areas

Facility	Time Period	Maximum Contributing Watershed Area (km^2)		Percent Difference (%)
		FEIS Addendum	Update	
Quarry 1	Baseline	0.04	0.04	0.3
	2018 to June 2019	1.48	1.62	9.4
GSP-1	Baseline	0.117	0.140	19.6
	2018 to Closure	0.162	0.156	-3.7
	Closure to Post-Closure	0.117	0.140	19.6
GSP-2	Baseline to 2022	0.034	0.078	129.3
	2022 to Closure	0.034	0.078	129.3
	Closure to Post-Closure	0.034	0.062	82.1
Underground Mine	Baseline to Post-Closure	0.011	0.011	-3.0
Northeast sector	Baseline to July 2020	1.880	1.91	1.5
	July 2020 to Post-Closure	0.643	0.684	6.4
Whale Tail WRSF	Baseline to Post-Closure	1.10	1.09	-0.7
North Sector	Baseline to Post Closure	0.289	0.243	-16.1
Whale Tail Pit	Baseline to Closure	1.16	1.17	0.6
	Closure (> IVR Pit full) to Post-Closure)	29.5	29.8	1.1
Whale Tail Lake (North Basin) / Whale Tail Attenuation Pond	Baseline to 2019	28.4	28.6	0.7
	2019	3.86	3.05	-20.9
	Whale Tail Lake (North) Dewatered to Closure	5.07	5.16	1.8
IVR Pit	Q3 2020 to Closure	1.05	1.18	12.0
	Closure to Post-Closure	27.3	25.4	-6.9
IVR WRSF	Baseline to Closure	0.788	0.92	16.2
	Closure to Post-Closure	0.822	0.977	18.9
IVR Attenuation Pond	Baseline to 2022	1.35	1.32	-2.5
	2022 to Closure	6.42	6.48	0.9
	Closure to Post-Closure	1	0.86	-14.1
Whale Tail Lake (South Basin)	Baseline	22.3	22.3	0.0
	Construction to Closure	28.7	28.8	0.3
	Closure to Post-Closure	22.3	22.3	0.0

5.0 MEAN ANNUAL WATER BALANCE

5.1 Quarry 1

5.1.1 Catchment Characteristics and Water Management

Prior to mining activities, the natural area of Quarry 1 drains to Whale Tail Lake (North Basin). The Quarry 1 catchment is primarily used to manage contact water until Whale Tail Lake (North Basin) is dewatered and the Whale Tail Attenuation Pond becomes available. Contact water accumulated in Quarry 1 is discharged entirely to Lake A16 (Mammoth Lake) through the O-WTP once available in March 2019. Quarry 1 becomes part of the Whale Tail Pit thereafter.

An overview of the local Quarry 1 catchment, along with natural and operational drainage pathways, is provided in Figure 6.

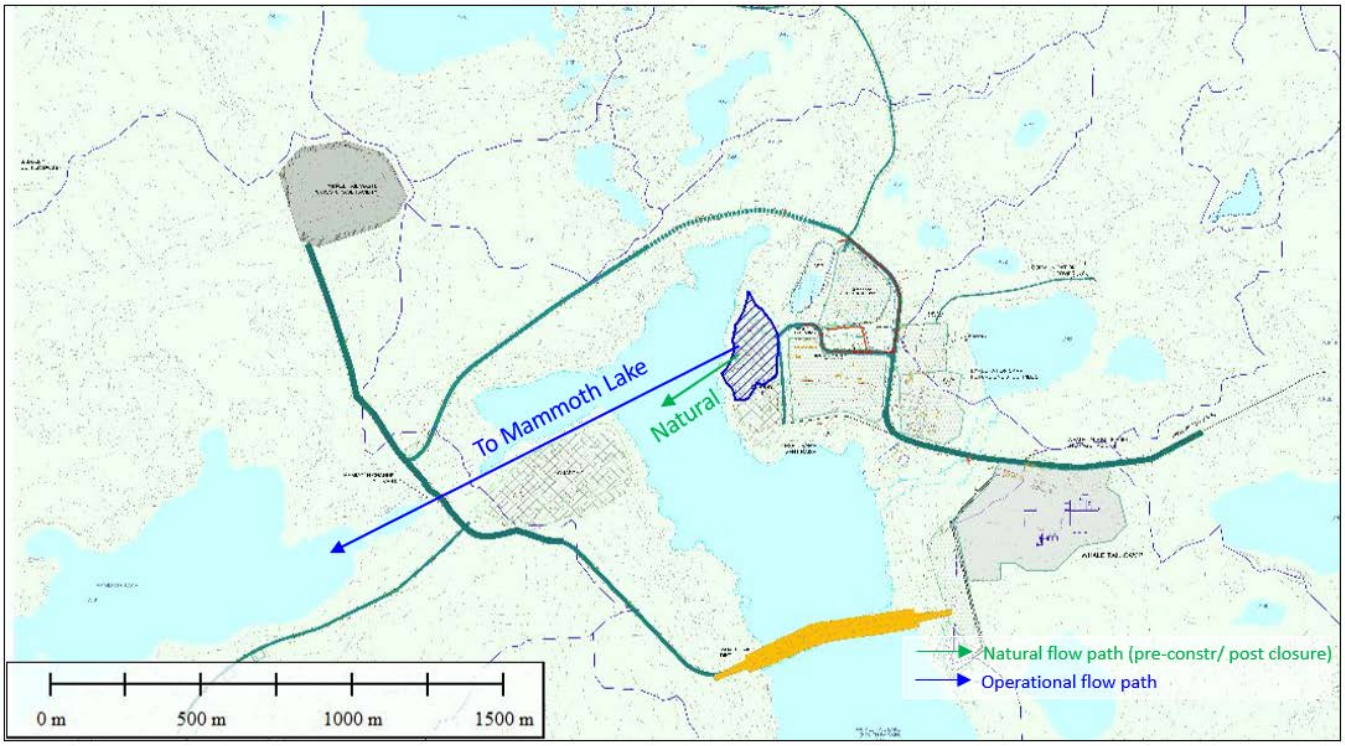

Figure 6: Quarry 1 Catchment Overview

Storage characteristics are summarized in Table 7, and elevation-storage-area relationships are provided in Appendix C. Drainage areas of Quarry 1 over time are summarized in Figure 7.

Quarry 1 has a baseline drainage area of 0.040 km^2. Contributing catchments - the Starter Pit, Whale Tail WRSF, the Camp Sector (i.e., disturbed area surrounding the camp), the Industrial Sector (i.e., disturbed area east of Quarry 1 consisting of developed pad areas and ore stockpiles), and the Overburden Sector (i.e., disturbed area south of the Starter Pit consisting of construction material and ore stockpiles- increase the area to 1.62 km^2 in 2018 until the Whale Tail Attenuation Pond is available.

Table 7: Storage Characteristics (Quarry 1)

Snapshot	Peak Drainage Area (km^2)	Operating Level		Capacity	
		Water Surface Elevation (masl)	Storage (m^3)	Water Surface Elevation (masl)	Storage (m^3)
Baseline	0.040	155.00	0	155.00	0
2018 to June 2019	1.62	139.00	0	155.00	203,450

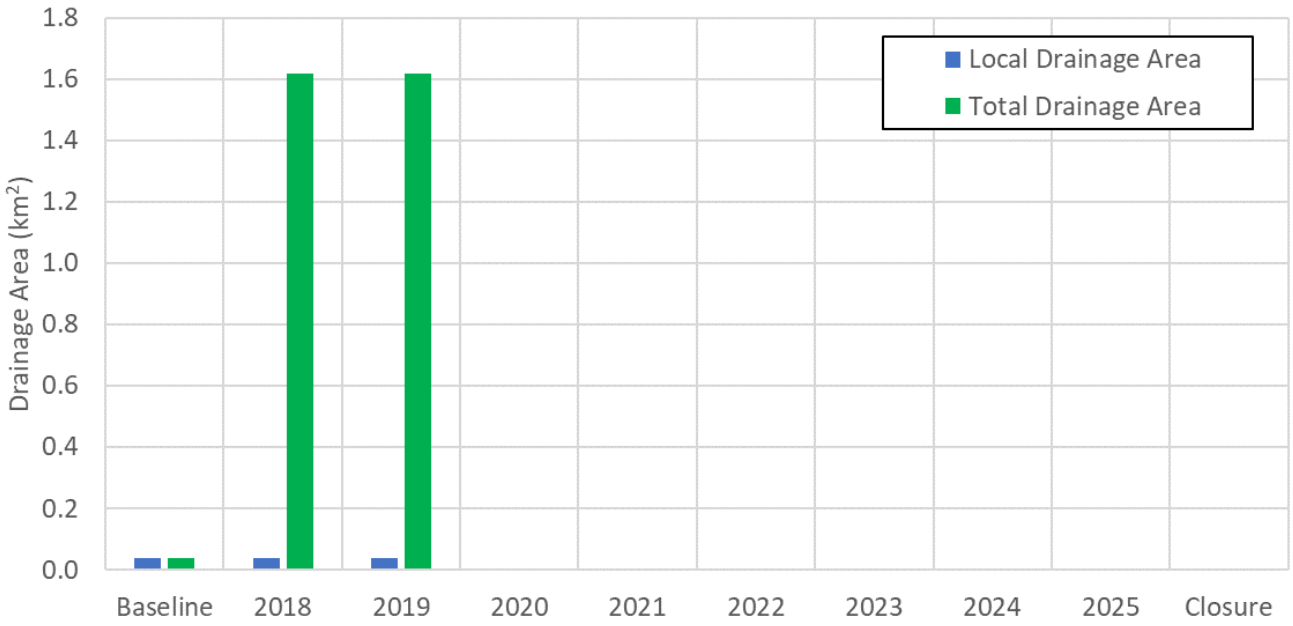

Figure 7: Drainage Area Progression through the Project (Quarry 1)

5.1.2 Water Balance

Inflows and outflows are summarized in Table 8, and presented in tabular form in Appendix F.

Table 8: Water Balance Flow Components (Quarry 1)

Figure	Flow Component	Flow Type	Start	End	Note / Comment
INFLOWS					
■ Figure 8 (Construction / Operations) ■ Figure 9 (Closure)	■ Runoff from the Quarry drainage area	■ Natural drainage	■ 2018	■ June 2019	■ Catchment runoff until decommissioning of Quarry 1 by June 2019 once Whale Tail Lake (North Basin) is dewatered.
	■ Runoff from the Starter Pit	■ Pump / Pipeline	■ July 2018	■ June 2019	■ Runoff collected from the Starter Pit until decommissioning of Quarry 1 by June 2019 once Whale Tail Lake (North Basin) is dewatered.
	■ Runoff from the Whale Tail WRSF Contact Water Collection System	■ Pump / Pipeline	■ 2018	■ June 2019	■ Runoff collected from the Whale Tail WRSF until decommissioning of Quarry 1 by June 2019 once Whale Tail Lake (North Basin) is dewatered and Whale Tail Attenuation Pond becomes operational.
	■ Runoff from the Industrial Sector, Overburden Sector and Camp Sector	■ Pump / Pipeline	■ 2018	■ June 2019	■ Runoff collected until decommissioning of Quarry 1 by June 2019 once Whale Tail Lake (North Basin) is dewatered and Whale Tail Attenuation Pond becomes operational. ■ Runoff diversion from the Camp Sector is initiated following completion of mining in Quarry 1 by end of July 2018.
	■ Pumped flows from the Truck Shop	■ Pump / Pipeline	■ 2018	■ June 2019	■ Flow from the Truck Shop until decommissioning of Quarry 1 by June 2019 once Whale Tail Lake (North Basin) is dewatered and Whale Tail Attenuation Pond becomes operational.
	■ Drilling Water	■ Pump / Pipeline	■ 2018	■ August 2018	■ Drilling water from Whale Tail Lake (South Basin) until mining of Quarry 1 is completed by August 2018.
OUTFLOWS					
■ Figure 10 (Construction / Operations) ■ Figure 11 (Closure)	■ Evaporation	■ n/a	■ 2018	■ June 2019	■ Evaporative losses proportional to the water surface area in Quarry 1.
	■ Drawdown through O-WTP	■ Pump / Pipeline	■ June 2019	■ June 2019	■ Drawdown of Quarry 1 to Lake A16 (Mammoth Lake) via the O-WTP. ■ Drawdown volume is expected to be approximately 237,250 m^3.

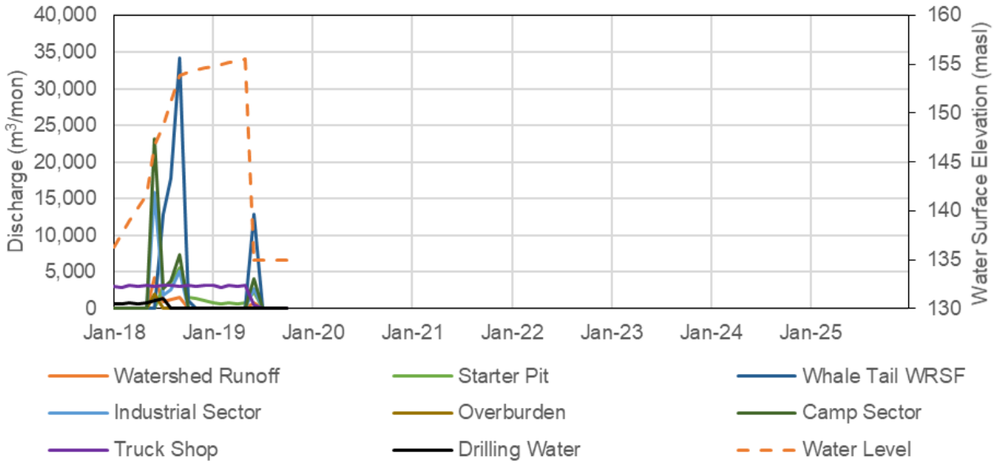

Figure 8: Inflows to Quarry 1 (Construction and Operations)

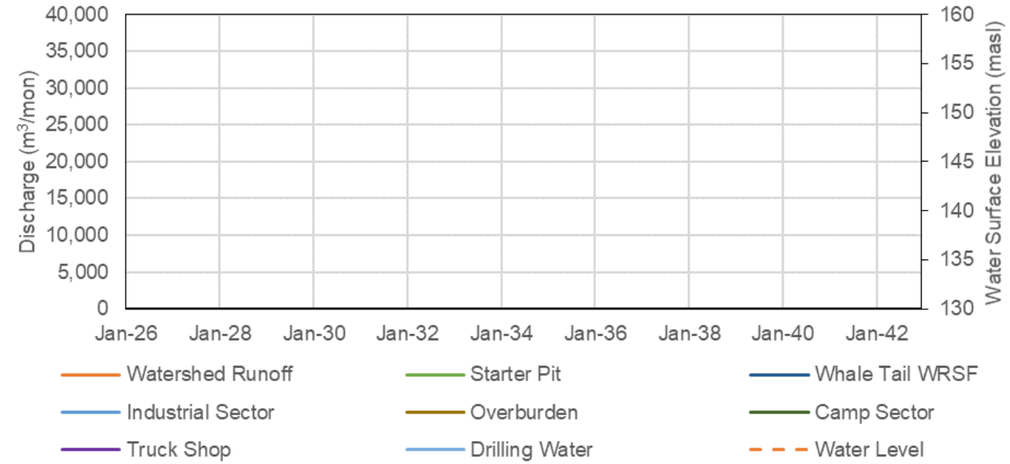

Figure 9: Inflows to Quarry 1 (Closure) – Quarry 1 integrated into the pit, waters report to the pit

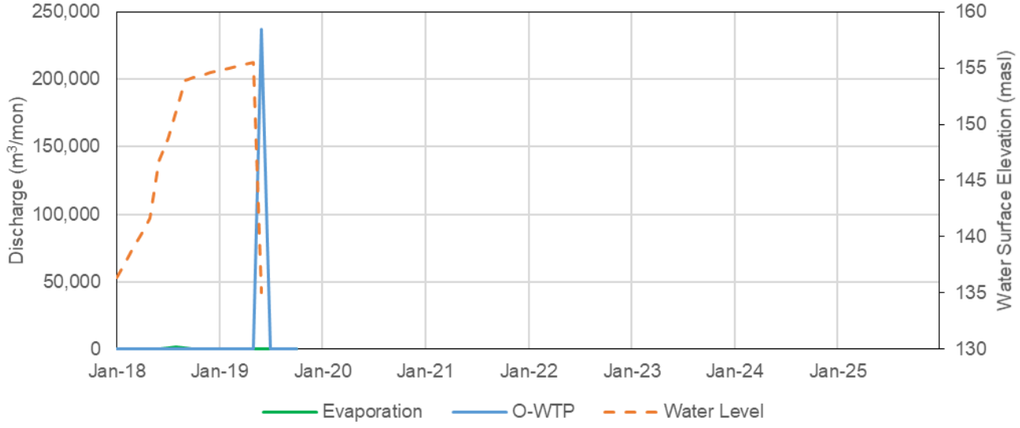

Figure 10: Outflows from Quarry 1 (Construction and Operations)

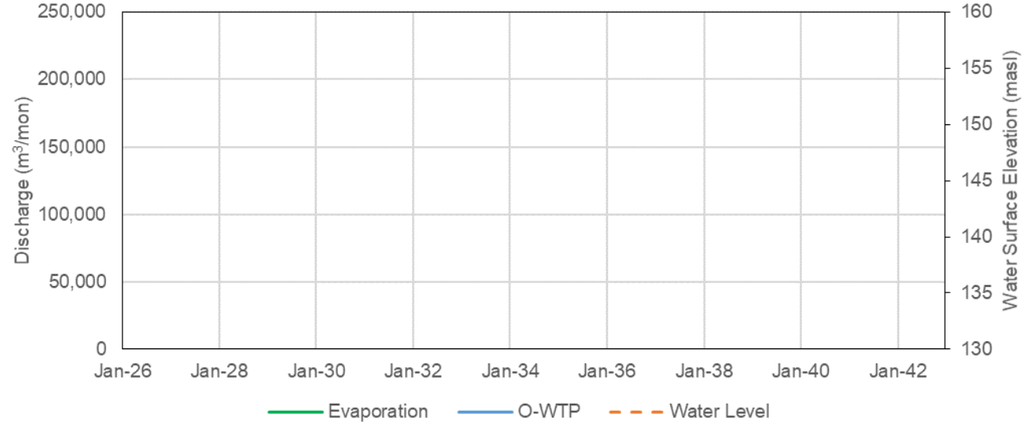

Figure 11: Outflows from Quarry 1 (Closure) – Quarry 1 integrated into the pit, waters report to the pit

5.1.3 Changes from the FEIS Addendum

The following changes are relevant to the Quarry 1 water balance:

- The total drainage area reporting to Quarry 1 is approximately 9% higher than for the Expansion Project FEIS Addendum reported in 2018 (Table 6). Other than the minor changes in catchment area due to the updated delineations, this increase is primarily due to the updated overburden and ore stockpile footprints.
- Changes to the runoff calculations for the Whale Tail WRSF. Although the runoff on the waste rock is significantly reduced, due to the small proportion of waste rock in the Whale Tail WRSF in the drainage area in 2018, there is only a small reduction in overall contribution from the WRSF drainage area.
- Dewatering schedule. In the model, once Whale Tail North is completely dewatered, flows are pumped to the Whale Tail Attenuation Pond instead of Quarry 1. Although the total volume dewatered from Whale Tail North remains constant, the schedule has changed (as described in Section 4.0). As a result, flows are still pumped to Quarry 1 in early June.

The combined impact of these changes results in an additional 52,400 m^3 reporting to Quarry 1 by June 2019 (240,730 m^3 compared with 188,330 m^3) (Figure 12).

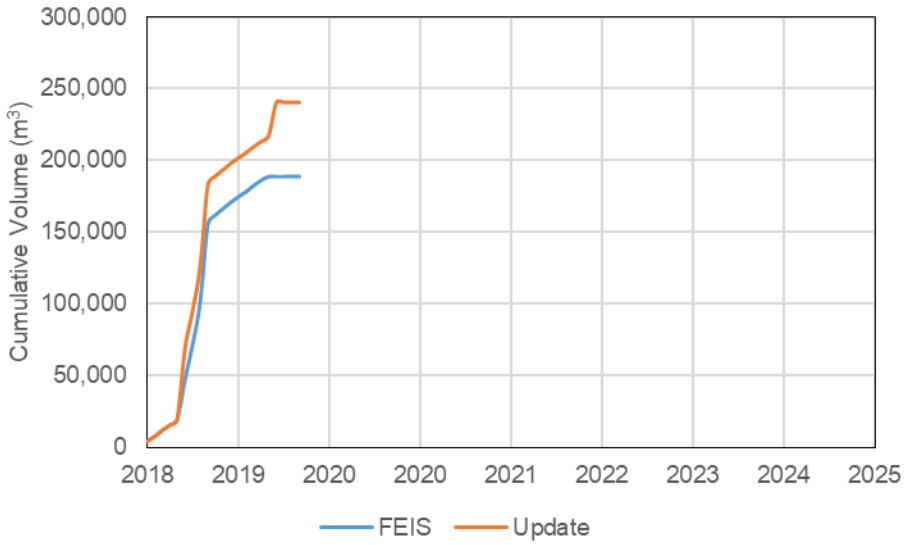

Figure 12: Comparison of Cumulative Inflows to Quarry 1 under the FEIS Addendum and the Current Water Balances

5.2 Groundwater Storage Pond System

A GSP system is designed to capture TDS (salt) affected waters. Up to three GSPs are planned to provide operational flexibility and adaptive management opportunity. GSP-1 is used to store high salinity water from early mining operations through the permafrost. GSP-2 is used to store low salinity water. A potential third pond is planned as a contingency.

5.2.1 Groundwater Storage Pond 1 (GSP-1)

5.2.1.1 Catchment Characteristics and Water Management

GSP-1 (former Pond AP-5) is located just northeast of, and drains naturally to, Whale Tail Lake. The pond is excavated and pumped dry prior to 2018 to permanently increase capacity in order to manage runoff, consumptive flows, groundwater inflows from the Underground Mine and the S-WTP (brackish) treatment unit brine concentrate reject throughout construction and operations. It is referred to as a GSP-1 once operational, and represented by GSP-1 in drawings provided in Appendix B. The purpose of this pond is to manage the high salinity flows from underground at the start of underground mining when a 20% brine is added to drilling water; and to receive the brine concentrate from S-WTP (brackish). This pond also receives excess water from the Whale Tail Attenuation Pond over the winter of 2019-2020, increasing its water level. The pond is subsequently flushed prior to freshet 2020 through the O-WTP to increase its storage capacity for the remainder of operations. An underground storage stope of approximately 10,000 m^3 capacity will also assist in retaining brine until January 2022 when it is pumped out to GSP-1.

The salt content of inflows from the Underground Mine is expected to decrease once underground development is advanced below the permafrost, after which drill water brining will stop and groundwater inflows will have a substantially lower natural TDS content (generally less than 1%; Golder 2016). This lower TDS water is managed separately in another Groundwater Storage Pond (GSP-2) to manage brackish water, as described in Section 5.2.1.3.

At closure, the content of GSP-1 is drawn down by pumping to flood the Underground Mine, and the empty pond is backfilled with clean (low leachable and non-acid generating (NML/NPAG)) waste rock, permanently reducing its storage to zero. Natural drainage patterns are then re-established towards Whale Tail Lake (North Basin) via the Whale Tail Pit.

An overview of the catchment, along with its drainage pathways, is provided in Figure 13.

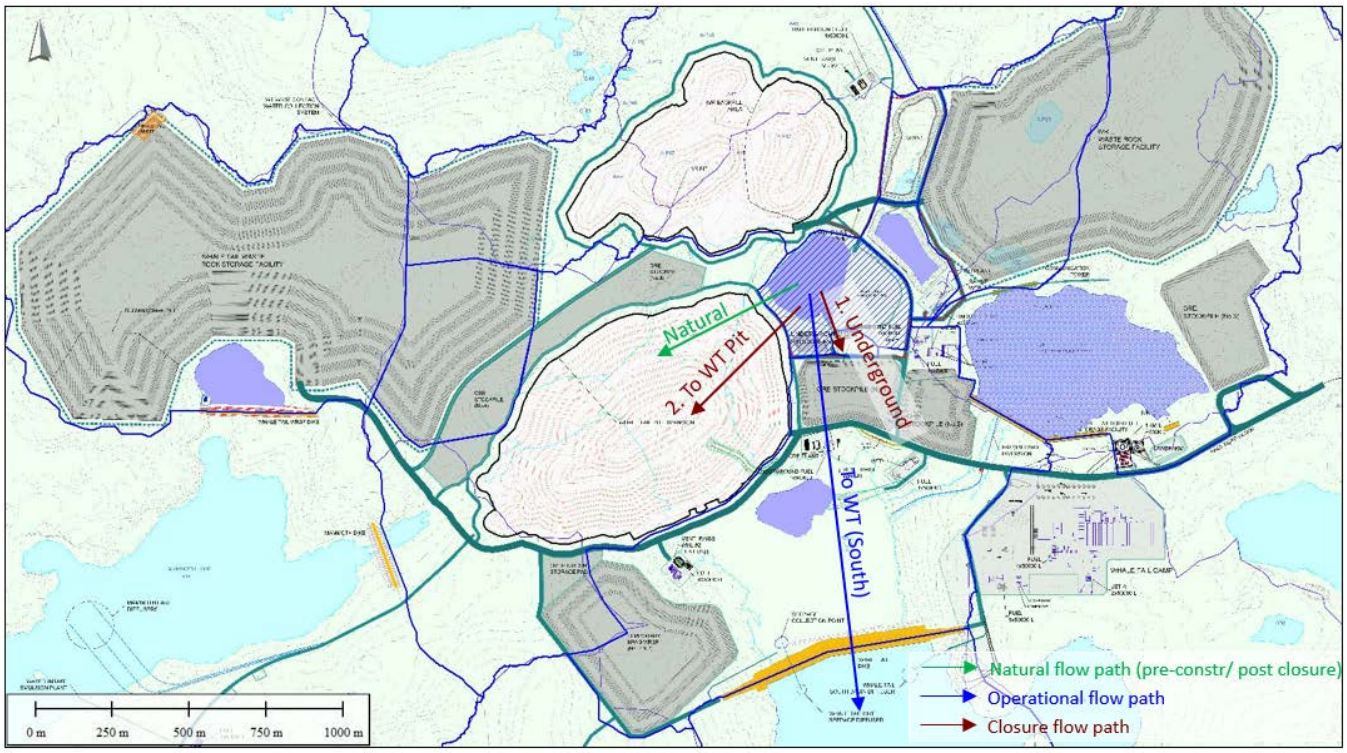

Figure 13: GSP-1 Catchment Overview

Storage characteristics are summarized in Table 9, and elevation-storage-area relationships are provided in Appendix D. Drainage areas of GSP-1 are summarized in Figure 14 through the Project.

The drainage area of GSP-1 increases temporarily from baseline conditions (0.140 km^2) to 0.156 km^2 due to the management of the Underground Mine overflow starting in 2018 until GSP-2 becomes operational in 2022. At closure, GSP-1 is backfilled and natural drainage patterns are re-established.

Table 9: Storage Characteristics (GSP-1)

Snapshot	Drainage Area (km^2)	Operating Level		Capacity	
		Water Surface Elevation (masl)	Storage (m^3)	Water Surface Elevation (masl)	Storage (m^3)
Baseline	0.140	160.9	n/a	160.9	n/a
2018 to 2022	0.156	144.0 – 160.9	0 – 309,150	160.9	309,150
2022 to Post-Closure	0.140	160.9	n/a	160.9	0

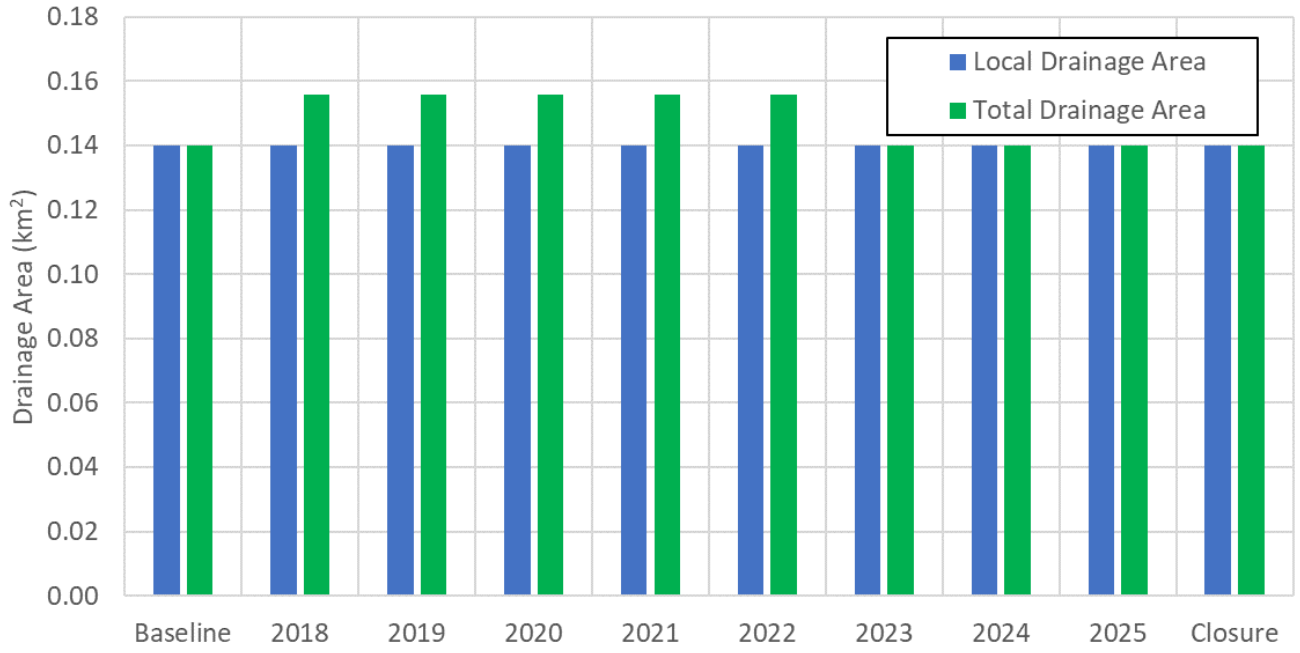

Figure 14: Drainage Area Progression through the Project (GSP-1)

5.2.1.2 Water Balance

Inflows and outflows are summarized in Table 10, and presented in tabular form in Appendix F.

Table 10: Water Balance Flow Components (GSP-1)

Figure	Flow Component	Flow Type	Start	End	Note / Comment
INFLOWS					
■ Figure 15 (Construction / Operations) ■ Figure 16 (Closure)	■ Runoff from natural areas	■ Natural drainage	■ 2018	■ Post-Closure	■ Runoff volumes are expected to be inversely proportional to the disturbed and waste rock pad areas.
	■ Runoff from the waste rock pad	■ Natural drainage	■ 2018	■ Closure	■ Runoff volumes are expected to be proportional to the area of the waste rock pad.
	■ Overflow from the Underground Mine	■ Pump / Pipeline	■ 2018	■ Closure	■ Overflow from the Underground Mine is expected by April 2020 to June 2022. ■ Overflow results primarily from groundwater inflows once the Underground Stope (intended to supplement the capacity of GSP-1) is full (assumed to be 10,000 m^3).
	■ Drawdown from the Underground Stope	■ Pump / Pipeline	■ 2018	■ Closure	■ Drawdown of the Underground Stope in January 2022.
	■ Overflow from the Whale Tail Attenuation Pond	■ Pump / Pipeline	■ Oct 2019	■ May 2020	■ Overflow from the Whale Tail Attenuation Pond during frozen conditions from October 2019 to May 2020.
	■ Brine from the S-WTP (brackish) Unit	■ Pump / Pipeline	■ Oct 2020	■ Closure	■ S-WTP (brackish) brine concentrate reject from treatment of the Whale Tail Attenuation Pond during frozen conditions from October 2020 to May 2021. ■ S-WTP (brackish) brine concentrate reject from treatment of GSP-2 which collects excess groundwater inflows from the Underground Mine from May 2022 to Closure.
OUTFLOWS					
■ Figure 17 (Construction / Operations) ■ Figure 18 (Closure)	■ Evaporation	■ n/a	■ 2018	■ Closure	■ Evaporative losses expected to be proportional to the water surface area of GSP-1. ■ At closure, GSP-1 is backfilled. It has negligible storage or evaporation potential.
	■ Discharge to the Underground Mine	■ Pump / Pipeline	■ 2018	■ 2021 Level > -275 masl	■ Supplemental consumptive flows to the Underground Mine when elevation of the development of the Underground Mine is shallower than -275 masl (i.e., below the base of the permafrost).
	■ Drawdown to the O-WTP	■ Pump / Pipeline	■ Jun 2020	■ Jun 2020	■ Drawdown of GSP-1 to Lake A16 (Mammoth Lake) via the O-WTP in June 2020. ■ Intended to prevent untreated overflow of the GSP-1 to the receiving environment and dilution of high salinity waters.
	■ Discharge to the S-WTP (brine) Unit	■ Pump / Pipeline	■ 2022 Level < -275	■ Closure	■ Treatment at a rate of 60 m^3/day in 2022. ■ Treatment at a rate of 90 m^3/day from 2023 to closure. ■ Treated water (permeate) is discharged to Whale Tail Lake (South Basin).
	■ Drawdown to the Underground Mine	■ Pump / Pipeline	■ Closure	■ Closure	■ Drawdown of GSP-1 to the Underground Mine to expedite refilling of the Underground Mine. ■ Drawdown is expected to be completed in January 2026.
	■ Runoff to Whale Tail Pit	■ Natural drainage	■ Closure	■ Post-Closure	■ Following drawdown, GSP-1 is backfilled with clean waste rock and its natural drainage patterns are re-established. ■ GSP-1 drains towards Whale Tail Lake via Whale Tail Pit.

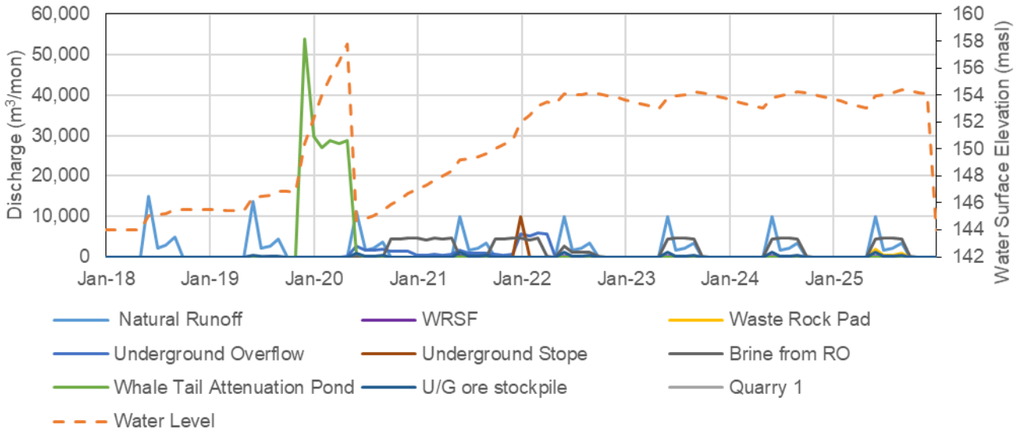

Figure 15: Inflows to GSP-1 (Construction and Operations)

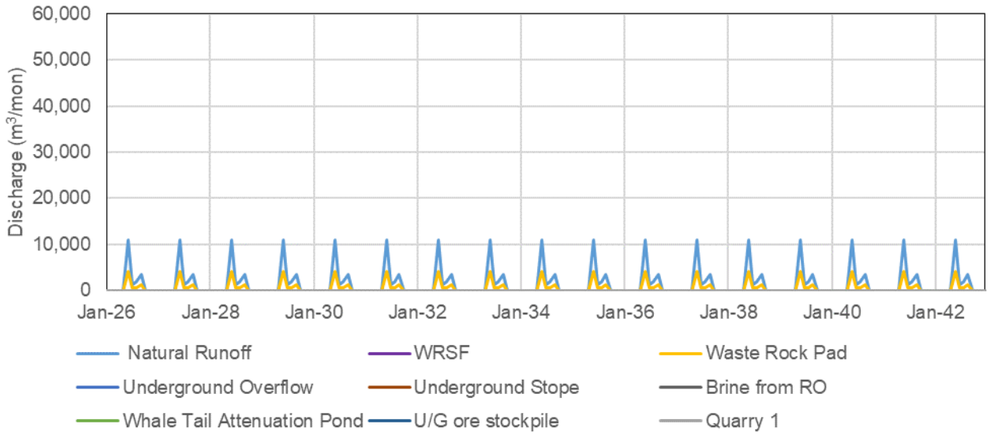

Figure 16: Inflows to GSP-1 Area (Closure)

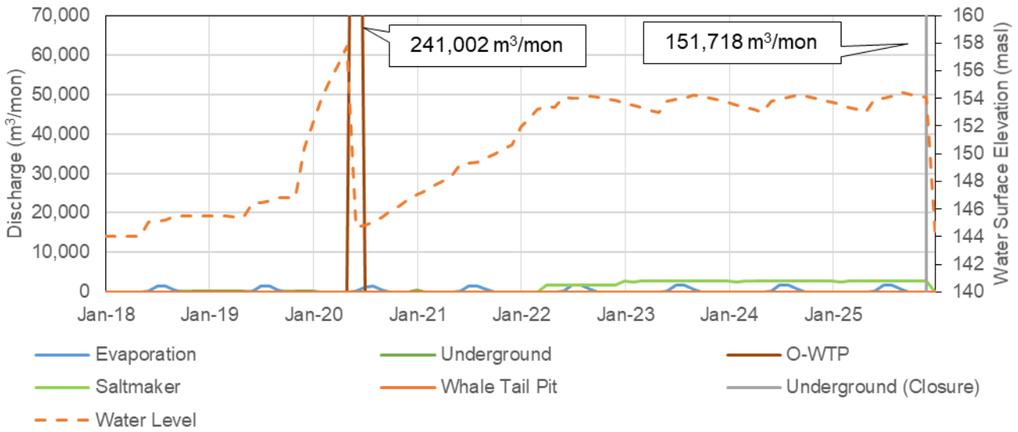

Figure 17: Outflows from GSP-1 (Construction and Operations)

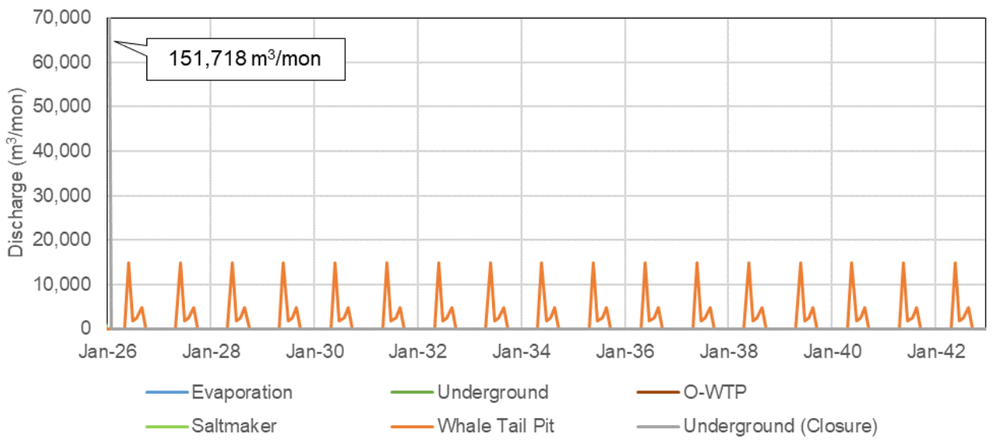

Figure 18: Outflows from GSP-1 Area (Closure)

5.2.1.3 Changes from the FEIS Addendum

The following changes are relevant to the GSP-1 water balance:

- The local drainage area reporting to GSP-1 has increased from 0.12 km^2 to 0.14 km^2 (20%). This is due to the larger footprint of the GSP as well as the footprints of the underground waste pad and the underground ore stockpile. However, the total drainage area is slightly smaller (0.156 km^2 compared to 0.162 km^2). This is approximately 9% higher than reported for the FEIS Addendum reported in 2018 (Table 6).
- The reduction of runoff from the Underground WRSF based on the OKC method of calculating runoff. This reduction only applies during operations. Once this waste rock is moved underground at closure, runoff from the pad reverts to the original calculation method.
- The reduction of overflow from the underground due to the updated hydrogeological inputs. The impact of these inputs on the underground flows is discussed further in Section 5.3.3.

The impact of these changes results in a slight decrease (approximately 1%) in cumulative inflows to GSP-1 in operations (540,650 m^3 vs. 545,100 m^3). In closure however, there is more inflow to the watershed. By the time Whale Tail Lake (North Basin) reaches its final elevation in 2042, the cumulative inflows are 11% higher than for the FEIS case (947,100 m^3 vs 853,200 m^3) (Figure 19).

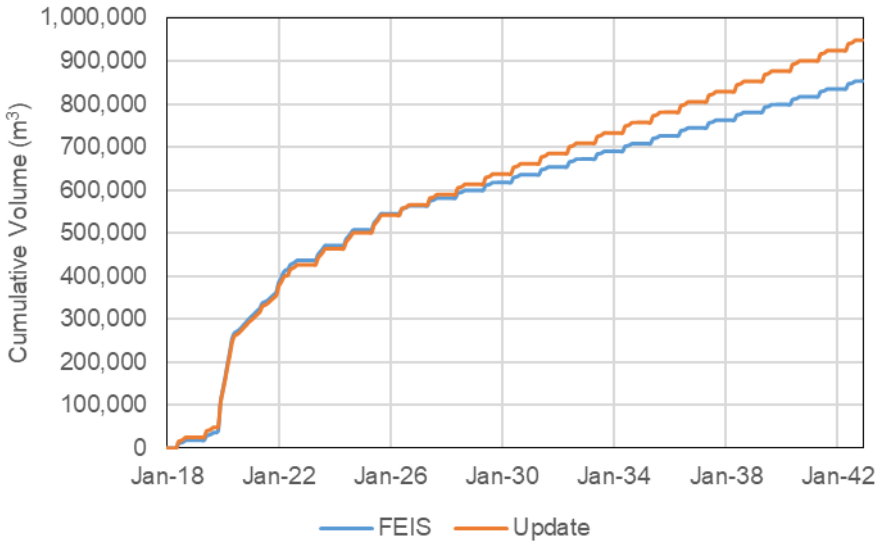

Figure 19: Comparison of Cumulative Inflows to GSP-1 under the FEIS Addendum and the Current Water Balances

5.2.2 Groundwater Storage Pond 2 (GSP-2)

5.2.2.1 Catchment Characteristics and Water Management

The catchment of the Groundwater Storage Pond 2 (GSP-2) is located just east of the catchment of GSP-1 and naturally drains to Lake A50 or to the IVR WRSF Contact Water Collection System once operational (see Section 5.9.3). The catchment of GSP-2 is part of the Northeast Sector (see Section 5.2.2.3) until Q3 2020 when the IVR Pit is initiated. It then becomes part of the IVR WRSF catchment until GSP-2 becomes operational in 2022 to manage excess low salinity water from the Underground Mine. Water from this pond is treated through the S-WTP

(brackish), producing a brine concentrate (sent to GSP-1) and a clean water permeate (sent to Whale Tail Lake (South Basin)) until closure when GSP-2 is drawn down by pumping to the Underground Mine, backfilled with NML/NPAG waste rock, and the natural drainage patterns are re-established.

An overview of the catchment, along with its drainage pathways, is provided in Figure 20.

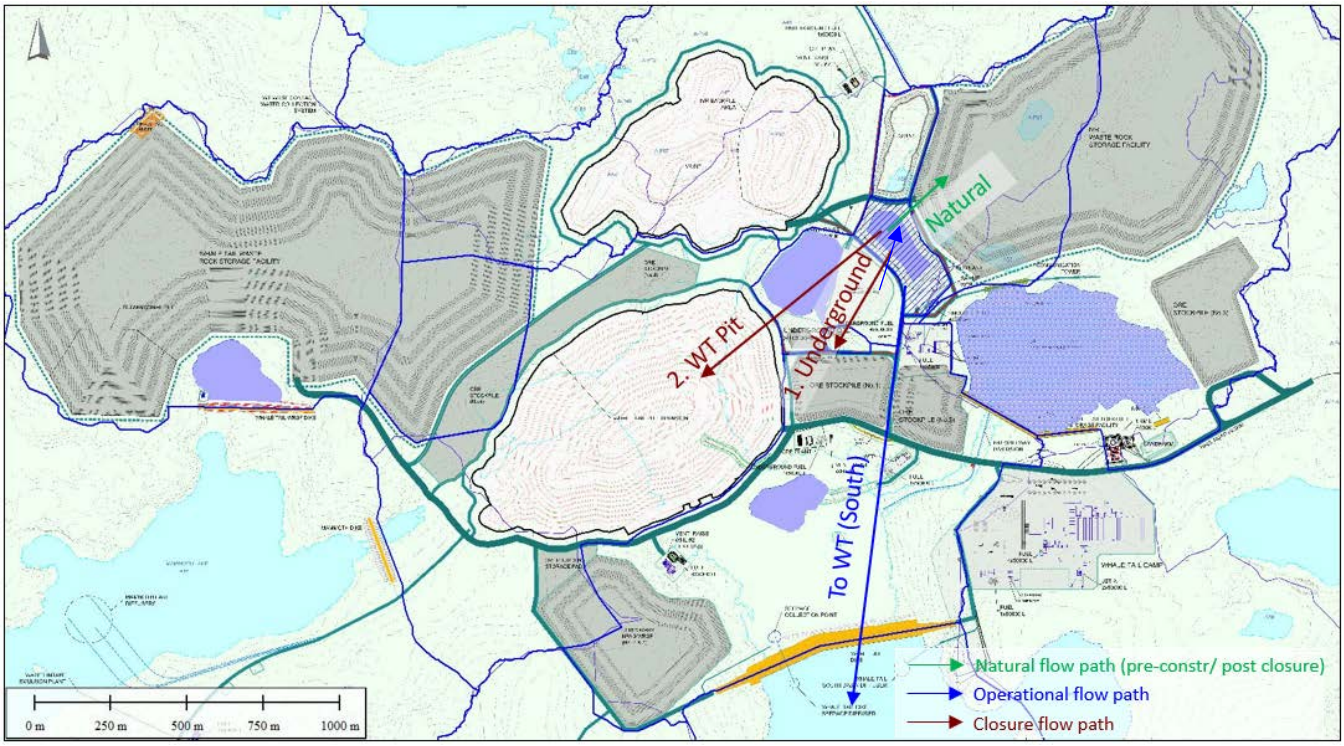

Figure 20: GSP-2 Catchment Overview

Storage characteristics, as determined based on this mean annual water balance, are summarized in Table 11. Drainage areas of GSP-2 are summarized in Figure 21.

The drainage area of GSP-2 is augmented from 0.062 km^2 to 0. 078 km^2 due to the management of the Underground Mine overflow starting in 2022. At closure, GSP-2 is backfilled and natural drainage patterns are re-established.

Table 11: Storage Characteristics (GSP-2)

Snapshot	Drainage Area (km^2)	Operating Level		Capacity	
		Water Surface Elevation (masl)	Storage (m^3)	Water Surface Elevation (masl)	Storage (m^3)
2022 to Closure	0.078	142.0 – 160.0	0 - 352,900	160.0	352,900
Closure to Post-closure	0.062	160.0	0	160.0	0

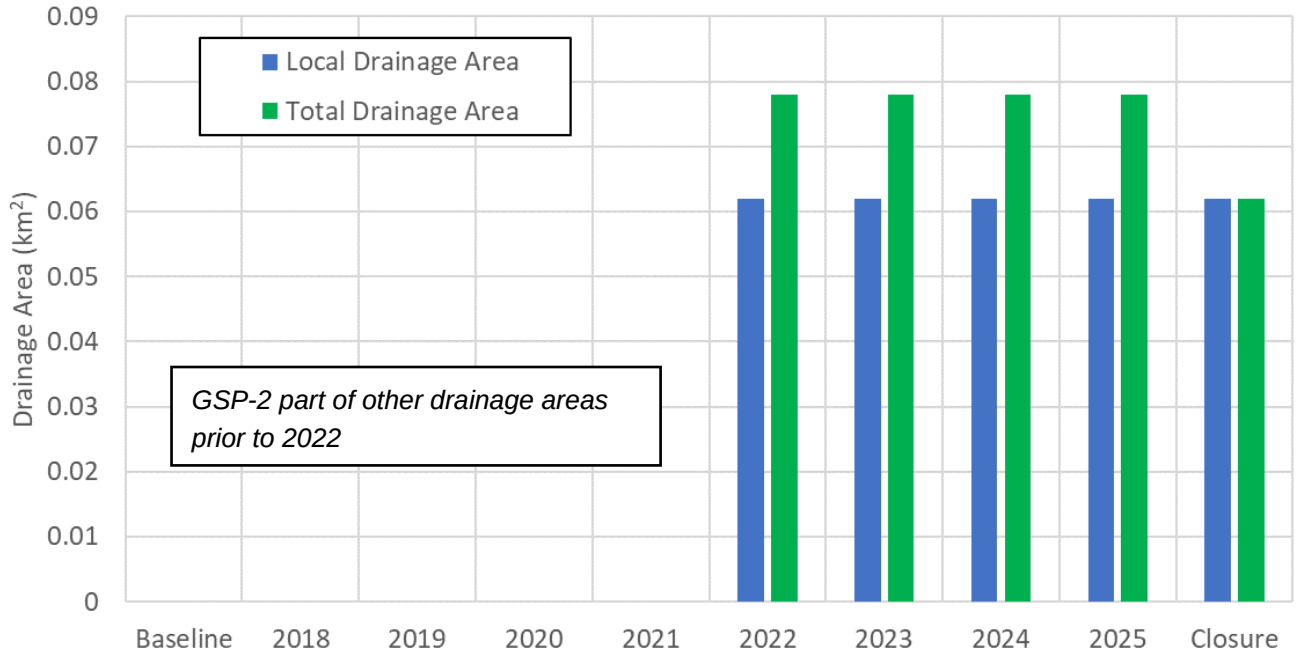

Figure 21: Drainage Area Progression through the Project for GSP-2

5.2.2.2 Water Balance

Inflows and outflows are summarized and discussed in Table 12, and presented in tabular form in Appendix F.

Table 12: Water Balance Flow Components (GSP-2)

Figure	Flow Component	Flow Type	Start	End	Note / Comment
INFLOWS					
■ Figure 22 (Construction / Operations) ■ Figure 23 (Closure)	■ Watershed runoff	■ Natural drainage	■ 2022	■ Post-Closure	■ Runoff to the GSP-2 catchment. ■ Prior to the initiation of GSP-2, runoff volumes are accounted for in the Northeast Sector until Q3 2020, and in the IVR WRSF catchment from Q3 2020 to 2022.
	■ Low salinity overflow from the Underground Mine Sump	■ Pump / Pipeline	■ 2022	■ Closure	■ Overflow from the Underground Mine Sump when salinity is appropriate to be managed through GSP-2. ■ Runoff volumes are expected to be consistent with groundwater inflows to the Underground Mine.
OUTFLOWS					
■ Figure 24 (Construction / Operations) ■ Figure 25 (Closure)	■ Evaporation	■ n/a	■ 2022	■ Closure	■ Evaporative losses expected to be proportional to the water surface area of GSP-2. ■ At closure, GSP-2 is backfilled. It has negligible storage or evaporation potential.
	■ Discharge to the S-WTP (brackish)	■ Pump / Pipeline	■ 2022	■ Closure	■ Runoff treatment at a maximum rate of 1,000 m^3 per day. ■ Resulting brine concentrate (assumed to be 15% of the treated volume) is conveyed to GSP-1. ■ Resulting treated water permeate (assumed to be 85% of the treated volume) is conveyed to Whale Tail Lake (South Basin).
	■ Drawdown to the Underground Mine	■ Pump / Pipeline	■ Closure	■ Closure	■ Drawdown of GSP-2 to the Underground Mine in January 2026 prior to backfilling.

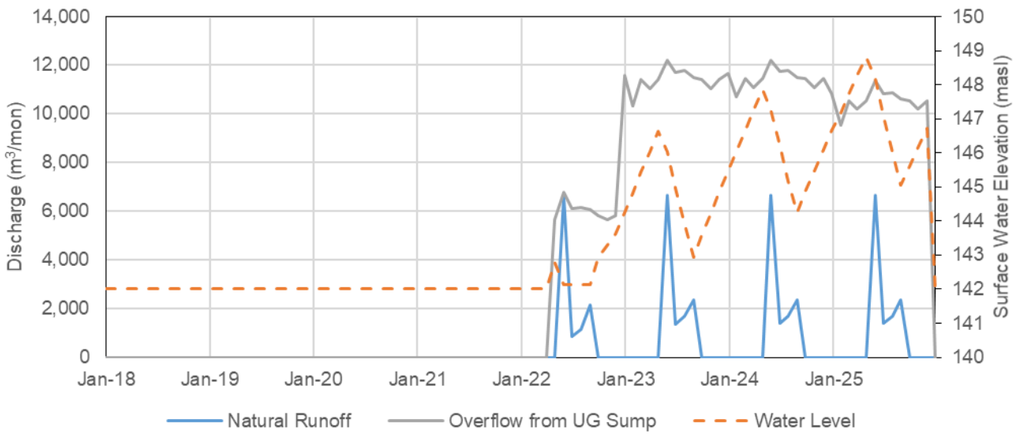

Figure 22: Inflows to GSP-2 (Construction and Operations)

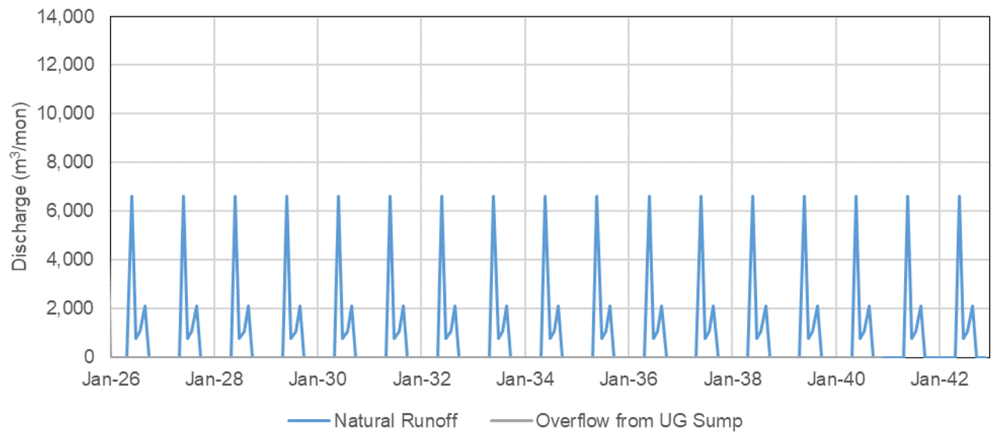

Figure 23: Inflows to GSP-2 (Closure)

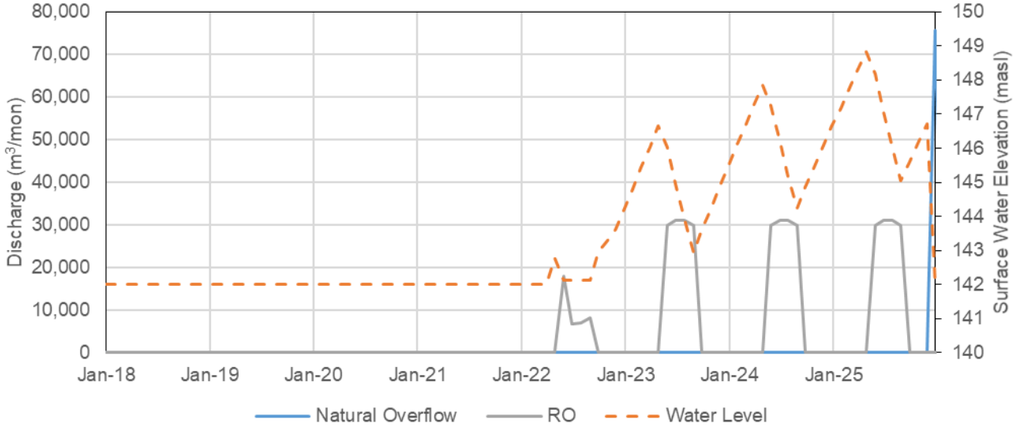

Figure 24: Outflows from GSP-2 (Construction and Operations)

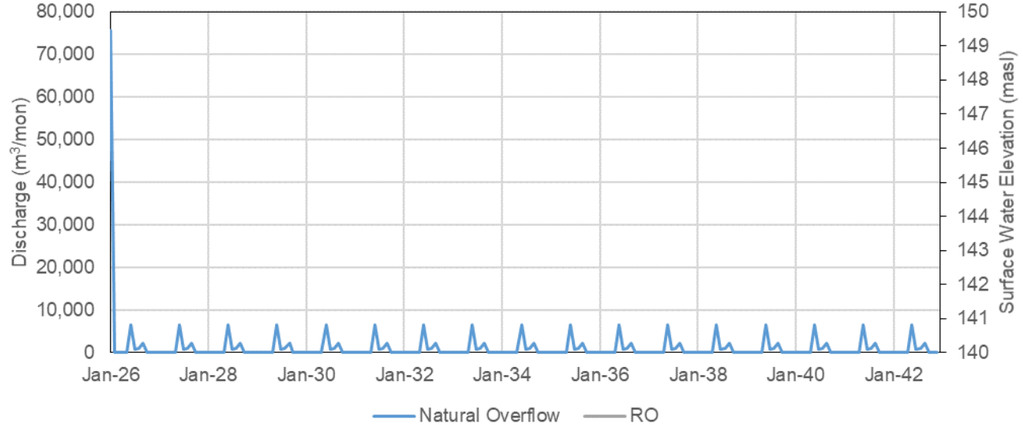

Figure 25: Outflows from GSP-2 (Closure)