Appendix 28

Meadowbank and Whale Tail 2025 Aquatic Effects Management Program (AEMP) Report

MEADOWBANK COMPLEX

2025 AQUATIC EFFECTS MANAGEMENT PROGRAM REPORT

In Accordance with

NWB Water License 2AM-MEA1530

and

NWB Water License 2AM-WTP1830

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March, 2026

EXECUTIVE SUMMARY

As required under Nunavut Water Board Water Licenses 2AM-MEA1530 and 2AM-WTP1830, Agnico Eagle's Meadowbank Complex maintains an Aquatic Effects Management Program (AEMP). According to the current AEMP (April, 2022; Version 5), this 2025 synthesis report aims to summarize and evaluate findings across all relevant aquatic monitoring programs to understand linkages between sources of stressors and potential effects. Specifically, for each of the Meadowbank and Whale Tail sites, the AEMP report:

- Summarizes the results of each of the underlying monitoring programs, and identifies exceedances of triggers and thresholds;

- For stressor variables with trigger or threshold exceedances, provides an integrated evaluation (across programs) of magnitude, spatial scale, temporal trends, causation, and uncertainty using a categorical rating system and an issue-specific conceptual site model; and

- Based on this evaluation, describes additional planned management actions, where required.

Across all programs for both sites in 2025, consistent trigger or guideline exceedances for stressor variables were only identified through the CREMP, for water-borne toxicants. For the Meadowbank site, statistically significant differences from baseline/references concentrations were identified for: conductivity, hardness, alkalinity, TDS, and related major ions (calcium, magnesium, potassium). For the Whale Tail site, these parameters similarly included conductivity, hardness, alkalinity, TDS and related major ions (calcium, magnesium, potassium, and sodium); as well as some nutrients (TKN, TOC, DOC); and lithium.

Briefly, results for these parameters in 2025 were generally consistent with those from recent previous years and indicate an increase in the measured parameter compared to baseline/reference concentrations only. None have effects-based guidelines, such as CCME Water Quality Guidelines for the Protection of Aquatic Life. While at least some portion of the changes are considered likely to be mine-related, there is no evidence to suggest concentrations are continuing to increase, or that they would result in adverse ecological effects. These conclusions continue to be supported by monitoring results for aquatic receptors across the AEMP programs.

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SECTION 1 • INTRODUCTION

The Aquatic Effects Management Program (AEMP) for the Meadowbank Mine was developed in 2005 as part of the project's Final Environmental Impact Statement (FEIS; Cumberland, 2005) and has been formally implemented since 2006. In December 2012, the AEMP was restructured to serve as an overarching "umbrella" program to integrate results of individual but related monitoring programs, and has been maintained in accordance with NWB Type A Water License 2AM-MEA1530 (Meadowbank site) and NWB Water License 2AM-WTP1830 (Whale Tail site) requirements. The scope of the original 2005 AEMP was renamed the Core Receiving Environment Monitoring Program (CREMP; reported separately). The AEMP Plan was last updated in April, 2022 (Version 5).

According to the Plan, this 2025 AEMP synthesis report aims to summarize and evaluate findings across all relevant aquatic monitoring programs to understand linkages between sources of stressors and potential effects. Specifically, for each of the Meadowbank and Whale Tail sites, this AEMP report will:

- Summarize the results of each of the underlying monitoring programs, and identify exceedances of triggers and thresholds;
- For stressor variables with trigger or threshold exceedances, provide an integrated evaluation (across programs) of magnitude, spatial scale, temporal trends, causation, and uncertainty using a categorical rating system and an issue-specific conceptual site model; and
- Based on this evaluation, describe additional planned management actions, where required.

SECTION 2 • MEADOWBANK SITE

2.1 SUMMARY OF RELEVANT ONSITE ACTIVITIES

No mine development activities occurred at the Meadowbank site in 2025. Ore processing operations continued, including transport, crushing, milling, and placement of tailings and waste rock material at the approved storage facilities.

Effluent discharge occurred to Second Portage Lake from January 1 to March 4, and March 23 to April 30, and to Wally Lake on September 1 and 2, and from September 21 through November 10, 2025.

Blasting and related monitoring also resumed at the Meadowbank site in 2025, as part of the construction of water management infrastructure at the former Quarry 23. A specific Blast

Monitoring Program was approved by DFO for this activity. No other construction activities with potential to impact on receiving aquatic environments occurred.

No reportable spills with potential to impact directly on the receiving aquatic environment occurred in 2025 outside of elevated turbidity/TSS in one effluent discharge sample to Second Portage Lake. This event is reported to regulators as a spill, and is discussed here under MDMER (effluent-related) monitoring results.

2.2 SUMMARY OF RESULTS OF AEMP MONITORING PROGRAMS

In 2025, monitoring according to the AEMP at the Meadowbank site included the following programs:

- Core Receiving Environment Monitoring Program (CREMP) and targeted effects-assessment studies, when required;
- Minesite Water Quality and Flow Monitoring;
- Effluent-related monitoring under the Metal and Diamond Mining Effluent Regulation (MDMER);
- Fish habitat evaluations under the Habitat Compensation Monitoring Plan;
- Groundwater Monitoring;
- AWAR and quarries water quality monitoring under the Freshet Action Plan;
- Blast monitoring for construction (activity-specific blast monitoring plan);
- Tailings Pore Water Monitoring; and
- Air Quality and Dustfall Monitoring.

The results of these monitoring programs are integrated in the AEMP and assist in the evaluation of potential effects of mining activities on the aquatic environment.

Programs that are part of the AEMP model but were not required to be conducted in 2025 for the Meadowbank site include:

- Fish-out programs; and
- Dike Construction and Dewatering Monitoring.

For each AEMP monitoring program conducted in 2025, a summary of trigger/threshold or guideline exceedances for environmental stressor variables is provided in Table 1. Across all programs, consistent trigger or guideline exceedances for stressor variables were only identified through the CREMP, for water-borne toxicants (conductivity, hardness, alkalinity, TDS, major ions – calcium, magnesium, potassium). As discussed in context in Section 2.3.1, these results are consistent with previous years and indicate an increase in the measured parameter compared to baseline/reference concentrations only. They do not indicate concerns for impacts to aquatic life.

Results of the AEMP monitoring programs in 2025 are further described in text below, and the integrated evaluation of sources, exposure, and effects, along with any adaptive management actions are provided in Section 2.3.

Table 1. Summary of trigger/guideline exceedances for AEMP programs at the Meadowbank site in 2025.

	AEMP Programs									
	CREMP	Dike Construction & Dewatering Monitoring	Habitat Compensation Monitoring	Effluent-Related Monitoring [6]	Minesite Water Quality and Flow Monitoring	Fish-Out Studies	Visual AWAR Water Quality Monitoring	Blast Monitoring	Tailings Pore Water Monitoring [2]	Groundwater Monitoring [1]
Stressor Variables										
Suspended solids	○		NA	○[5]	○		○	NA	NA	○
Sediment deposition	NA		NA	NA	NA		○	NA	NA	NA
Water-borne toxicants	● (grey)		NA	○	NA		NA	NA	NA	○
Sediment toxicants	NA		NA	NA	NA		NA	NA	NA	NA
Nutrients	○		NA	○	NA		NA	NA	NA	○
Other physical stressors	NA		NA	NA	NA		NA	○	NA	NA
Effects Variables										
Phytoplankton	○		NA	NA	NA		NA	NA	NA	NA
Zooplankton	NA		NA	○	NA		NA	NA	NA	NA
Fish	NA		○[4]	○	NA		NA	NA	NA	NA
Benthic invertebrates	○		NA	NA	NA		NA	NA	NA	NA
Periphyton	NA		NA	NA	NA		NA	NA	NA	NA
Fish habitat	NA		○	NA	NA		○[3]	NA	NA	NA

Notes:

1 - Results are compared to NWB Water License effluent criteria for reference only. No release to surface water at this time.

2 - Results pending. No release to receiving environment in 2025.

3 - Road material deposition over bridge at water crossings. Potential for impacts to fish habitat, remedial actions underway.

4 - Some fish habitat compensation criteria for success were not met, but no change from baseline.

5 - For one sample, initial laboratory analysis exceeded the grab limit, but re-analysis met the limit (30 mg/L TSS). Monthly limit was met.

6 - Monthly sublethal toxicity testing for effluent with an alga, a zooplankton, a macrophyte and a fish is also conducted as required under MDMER and reported on a 3-year cycle

○ Stressor variables: No trigger/guideline exceedance or significant difference from baseline/reference
Effects variables: No apparent effects or unlikely mine-related

● (grey) Stressor variables: Trigger or guideline exceedance (and significant difference from baseline/ref. where available)
Effects variables: Possible mine-related effects (discussed in text)

● Observed effects, likely mine-related (discussed in text)

Note: Results for air quality are reviewed to inform trends assessments, but do not have triggers set in the context of effects on the aquatic environment, so are not included in this table.

2.2.1 CREMP

The Core Receiving Environment Monitoring Program (CREMP) is the overarching annual and long-term aquatic receiving environment monitoring program for the Meadowbank Complex. Through this program, mine-related impacts are tracked through evaluation of water quality, sediment quality, and lower trophic level receptors at a suite of local lakes using site-specific trigger/threshold values as well as a statistically robust before-after-control-impact (BACI) analysis model. The Core Receiving Environment Monitoring Program report for 2025 is provided as an appendix of the 2025 Annual Report to the NIRB. Highlights in the AEMP context are provided below.

In 2025, the Meadowbank CREMP focused on near-field monitoring locations in Third Portage Lake, Second Portage Lake, and Wally Lake (TPN, TPE, SP, WAL), along with reference lake stations INUG and PDL. Routine monitoring at mid- and far-field locations has been suspended, and none was required in 2025.

The CREMP data analysis includes comparison of annual means to established trigger values. For parameters exceeding triggers, a statistical analysis of changes compared to baseline values and reference lakes is performed using a before-after-control-impact (BACI) model.

Water Quality: Similar to previous years, CREMP triggers for the annual mean were exceeded and significant differences from baseline/reference occurred in the BACI analysis for total dissolved solids and related parameters (hardness, conductivity, alkalinity, and constituent major ions such as calcium, magnesium, potassium) at some or all near-field lake monitoring locations evaluated (TPN, TPE, SP, WAL).

Sediment: Sediment chemistry was not required to be analyzed in 2025, other than total organic carbon (TOC) which is used in the interpretation of benthic invertebrate results.

Phytoplankton: Phytoplankton biomass and taxa richness were generally similar to previous years and the range of historical values. No statistically significant changes in biomass in excess of trigger values (20% effect size) occurred. A statistically significant decrease in excess of the trigger value for taxa richness occurred at Wally Lake only. This was considered more likely due to environmental variability than mine activity, particularly since effluent was not discharged to Wally Lake until after the phytoplankton sampling dates in 2025.

Benthic Invertebrates: For benthic invertebrates, both abundance and taxa richness were also within historical ranges and generally consistent with baseline/reference conditions. No statistically significant changes in the benthic invertebrate community were found in the 2025 CREMP analysis.

2.2.2 Water Quality and Flow Monitoring

Results of water quality analyses for managed non-contact water and seepage to the receiving environment are discussed here. Complete results of the Water Quality and Flow Monitoring program are provided in Section 8.5 of the 2025 Meadowbank Complex Annual Report.

East and West Diversion Ditches (ST-5/ST-6)

Meadowbank Mine non-contact water collection locations with discharge to the receiving environment consist of the East and West diversion ditches. These ditches were constructed on the north side of the mine site to intercept overland flow and direct it to pond NP-2 and Third Portage Lake, respectively. For these locations, single samples are collected monthly during open water (generally open water lasts from June – October) for analysis by an accredited laboratory and compared to NWB Water License TSS criteria for individual grab samples and the monthly mean. Results are reported as locations ST-5 and ST-6. For both locations, all results in 2025 were in compliance with these criteria.

Waste Rock Storage Facility Seepage (ST-16) and Pond NP-2

In 2013, seepage from the North Cell TSF through the Portage WRSF was identified and sampled as sump ST-16, with some migration of contaminants to the near shore of receiving environment pond NP-2. Beginning in 2014, any water in the sump has been pumped back to contact water management infrastructure, and a targeted water quality monitoring campaign occurred at NP-2 and downstream lakes (NP-1, Dogleg and Second Portage). Results of that evaluation confirmed no impacts to water quality in downstream lakes. Yearly water quality monitoring at NP-2 continues for verification. There are no applicable NWB Water License limits for either ST-16 or the NP-2 location. Results for NP-2 are used as applicable to inform the AEMP integrated analysis.

Mill Seepage (TPL-Assay)

Monitoring results for the designated location in Third Portage Lake (TPL-Assay) in response to mill seepage (first identified in 2013) continue to indicate no impacts to the near shore receiving water. The seepage appears to be effectively contained through construction of an interception trench (2014) and installation of a pumping system. Pumping is conducted from the interception trench, as required, and sampling is completed for adjacent monitoring wells when water is present, and at the designated near-shore monitoring station in Third Portage Lake. There are no applicable license limits. Results are used as applicable to inform the AEMP integrated analysis.

2.2.3 Effluent-Related Monitoring

MDMER monitoring requirements include monitoring effluent at the final discharge point (weekly/quarterly chemistry analysis, daily discharge volume, and monthly effluent toxicity testing), receiving environment water quality (4x/year monitoring at discharge and reference areas), and receiving environment biological monitoring studies (fish and/or benthic invertebrate monitoring on a three-year cycle). Results for 2025 in relation to regulatory criteria are summarized here and full results (Section 8.5 of the 2025 Annual Report) are used as applicable to inform the integrated analysis.

Discharge to Second Portage Lake (ST-8/ST-MMER-3)

In 2025, East Dike seepage water was discharged to the receiving environment of Second Portage Lake at the Meadowbank site from January 1 to March 4, and March 23 to April 30. The final discharge point is reported as ST-8/ST-MMER-3. One grab sample for TSS (32 mg/L; March 4) in effluent exceeded the MDMER/NWB License limit (30 mg/L), but re-analysis of that same sample (30 mg/L) met the limit. The monthly mean (8.4 mg/L) also met the limit (15 mg/L). All other effluent water quality analyses were in compliance with MDMER/NWB Water License criteria. Acute lethality effluent testing (Rainbow trout and *Daphnia magna*) was also performed as part of the MDMER effluent characterization, as required. In all required tests with rainbow trout and *Daphnia magna*, 0% mortality was reported at 100% effluent concentration.

EEM sub-lethal and acute lethality tests with four test species (*Ceriodaphnia dubia*, fathead minnow, *Lemna minor*, *Pseudokirchneriella subcapitata*) were sampled twice in 2025 (January 13 and April 7). Briefly, all test results showed no acute lethality, and sublethal effects were identified in one test (January 13) for *Ceriodaphnia dubia* only. Toxicity test results will be analyzed in context as part of the Cycle 6 EEM Biological Monitoring Interpretive Report (due in July, 2027), along with receiving environment water quality analyses.

Discharge to Wally Lake (ST-10/ST-MMER-2)

Discharge of effluent to Wally Lake occurred on September 1 and 2, and from September 21 to November 10, 2025. The final discharge point is reported as ST-10/ST-MMER-2. All water quality analyses were in compliance with MDMER/NWB Water License criteria. Acute lethality effluent testing (Rainbow trout and *Daphnia magna*) was also performed as part of the MDMER effluent characterization, as required. In all required tests with rainbow trout and *Daphnia magna*, 0% mortality was reported at 100% effluent concentration.

EEM sub-lethal and acute lethality tests with four test species (*Ceriodaphnia dubia*, fathead minnow, *Lemna minor*, *Pseudokirchneriella subcapitata*) were sampled three times in 2025 (September 22, October 6, November 10). Briefly, all test results showed no acute lethality, and sublethal effects were identified in the last two tests for *Pseudokirchneriella subcapitata* only. Complete results will be analyzed in context as part of the Cycle 6 EEM Biological Monitoring Interpretive Report (due in July, 2027), along with receiving environment water quality analyses.

The last EEM Biological Monitoring Interpretive Report (Cycle 5) for the Meadowbank site was dated June 28th, 2024. This report consisted of an Investigation of Cause (IOC) after higher benthic invertebrate population densities were observed in effluent discharge areas compared to reference in the previous two cycles (Wally Lake discharge location (2017) and Second Portage Lake discharge location (2020)). Fish population and tissue studies were not required as part of Cycle 5. The study re-evaluated available data from EEM and CREMP studies on effluent and surface water quality, sediment quality, and benthic invertebrate communities from 2006 – 2023 for the two exposure areas (SP and WAL) and two reference areas (INUG and PDL). The objective was to determine if variations in benthos covary with water or sediment quality variables that are associated with the released effluent. Results of the IOC indicated considerable support that variability in benthic invertebrate densities (higher density in exposure areas) were caused by mine-related changes in conductivity (i.e. major ions) from effluent release.

2.2.4 Fish Habitat Compensation Monitoring

The 2025 Habitat Compensation Monitoring Report is provided as an appendix of the 2025 Annual Report. Results are summarized here and used as supplementary information in the AEMP assessment, where relevant.

Briefly, this program aims to demonstrate whether fish habitat compensation features developed and permitted under Meadowbank's *Fisheries Act* Authorizations are constructed and functioning as intended. In 2025, monitoring according to the HCMP was required for two features; the R02 spawning pads and the Dogleg Ponds feature. In the AEMP context, no trigger or guideline values apply; rather, the evaluation focuses on whether offsetting criteria for success are ultimately met.

R02 Spawning Pads Monitoring

In 2009, a set of spawning pads was constructed in the R02 stream to create optimal spawning habitat for Arctic grayling. Monitoring of structure and fish populations has occurred every one to two years since that time. Stability of the feature continued to be visually confirmed in 2025, with berms and gravel/cobble substrate largely intact. On this basis, fish habitat offsetting criteria for success are met. Continued use of the R02 reach by Arctic grayling without major changes in population structure has been well demonstrated historically (through 2021). Survey intensity was reduced in 2025 in consultation with DFO, and neither adults nor fish larvae were observed at this location, but fish eggs were found within the constructed spawning area, confirming ongoing use.

Dogleg Ponds Monitoring

Dogleg Pond, NP-1, and NP-2 are adjacent ponds on the Meadowbank Mine site, which ultimately drain to Second Portage Lake. Construction of a diversion channel in from NP-2 to NP-1 in 2013 was predicted to result in slightly increased water levels in these ponds and the opening of previously inaccessible fish habitat in NP-1. This year (2025) was scheduled as the final year of monitoring according to the HCMP, after which time success would be determined.

Surface area of these ponds was measured in 2021 and 2024 to determine whether predictions have been met. In both years, combined surface area across all three ponds exceeded the predicted total. Fish presence surveys (2015, 2017, 2019, 2021 and 2025) and the weight of evidence to date suggests no major changes in the species assemblages inhabiting the three ponds have occurred following construction of the diversion channel. Small-bodied fish were identified in NP-1 (previously fish-less) in some assessment years, but presence of lake trout and round whitefish has not been confirmed. These large-bodied species were predicted to gain access to NP-1, at least seasonally. Criteria for success for this metric are therefore not considered to have been met. Overall impacts on habitat offsets site-wide are small; habitat gains are reduced by 0.91 HU out of a total planned gains of 65 HU in the associated management plan. Agnico Eagle will consult DFO to determine next steps.

2.2.5 Groundwater Monitoring

The complete 2025 Groundwater Monitoring Report is provided as an appendix of the 2025 Annual Report, with a summary below in the context of the AEMP.

Regional groundwater at the Meadowbank site is interpreted to flow east towards Third Portage Lake and Second Portage Lake. On a local scale, surface and groundwater flow is influenced by local topography and mining operations at previously mined pits and from tailings storage operations. Overall, the 2025 program results continue to indicate that while contaminant transport from the tailings cells has locally affected groundwater quality to the west of the central dump and mined-out pits, the current gradient between the mined-out pits and surrounding lakes (SPL, TPL) is preventing advection from carrying contaminants further eastwards towards those lakes.

Groundwater contamination is therefore not likely to be a potential exposure pathway into the receiving aquatic environment and is not considered further in the AEMP assessment at this time.

While not directly applicable to groundwater, water quality results of this program are also compared to the maximum average concentration (MAC) limit of the NWB Water License for Third Portage Lake effluent discharge, for comparative purposes only. Parameters include TSS, chloride, various nutrients, cyanide, and a selection of metals, including those regulated under MDMER. In 2025, all parameters concentrations met these criteria.

2.2.6 AWAR and Quarries Water Quality Monitoring

Under the Freshet Action Plan, pre-freshet and freshet inspections were conducted at bridges and culverts along the AWAR in 2025 daily to monthly (as require based on flow conditions) from May through September. These inspections are conducted to document the presence/absence of flow, erosional concerns, and turbidity plumes. No turbidity plumes or erosional concerns were observed, and no samples were required to be collected.

In fall 2024, deposition of road material at bridge crossings along the AWAR was identified. Road material is apparently being entrained by passing vehicles and falling over the bridge deck. Agnico Eagle has proposed an action plan and is working with DFO to remediate this situation.

2.2.7 Blast Monitoring

Blasting and related monitoring also resumed at the Meadowbank site in 2025, as part of the construction of water management infrastructure at the former Quarry 23. An activity-specific Blast Monitoring Program was approved by DFO for this activity. The complete blast monitoring report is provided as an appendix of the 2025 Annual Report.

In total, 18 blasts were required to be monitored. There were no exceedances of blast monitoring criteria related to protection of fish (DFO limits for peak particle velocity and instantaneous pressure change).

2.2.8 Tailings Pore Water Monitoring

The Tailings Pore Water Monitoring program is discussed in Section 5 of the 2025 Annual Report. Briefly, in 2025 Agnico Eagle collected monthly tailings effluent slurry samples prior to disposal in Portage Pit A. Reclaim water from the pits is also sampled, when safely feasible. There are no applicable license limits. Periodic sampling for in-pit tailings and porewater were conducted since August 2022 in order to characterize the tailings and porewater in Goose Pi. Results, when available, will inform closure and post-closure monitoring plans for the Meadowbank Mine and will be presented in the Closure and Reclamation Plan. As a result, pore water monitoring is not considered further in the AEMP assessment at this time.

2.2.9 Air Quality and Dustfall Monitoring

The complete 2025 Air Quality and Dustfall Monitoring Report is provided as an appendix of the 2025 Annual Report. Across the parameters evaluated (suspended particulates, NO_2, dustfall), dustfall and annual average TSP are considered the parameters most relevant to the AEMP analysis. Annual average TSP results in 2025 and historically have remained well below regulatory guidelines. In 2025, two of 48 monthly dustfall samples exceeded the related management threshold, which is equivalent to the Alberta Environment guideline for industrial areas. It is noted that this guideline relates to nuisance/aesthetic concerns, not environmental quality. For the purposes of the AEMP evaluation, trends in dustfall are reviewed to help understand potential linkages to observed exceedances of aquatic triggers/guideline values. Visual assessment of trends to date (since 2011) indicates that in general, rates of dustfall appear to have been stable over time and across monitoring locations.

2.3 INTEGRATION OF MONITORING RESULTS

According to the AEMP, the results of the monitoring programs were integrated in a mechanistic fashion with a thorough review of results to identify any patterns among the relevant receiving environment monitoring programs. For groups of stressor variables where triggers or guidelines were consistently exceeded in 2025 (summarized in Section 2.2), a discussion of results across AEMP programs is provided here to explore spatial scale, temporal trends, causation, and uncertainty. Patterns among the programs are then characterized using an issue-specific conceptual site model, which assists in the evaluation of the transport pathways, provides information on specific media (identifies stressors) and evaluates receptors of concern (effects variables).

In 2025, water quality (water-borne toxicants, specifically TDS/major ions and related parameters) was the only stressor variable for which associated triggers or guidelines were consistently exceeded. The following activities were identified primarily as having the potential to impact water quality in the receiving environment, and are considered in the source evaluation:

Effluent Discharge

- Historical (to Wally Lake, Second Portage Lake) and current (Vault attenuation pond to Wally Lake, as well as East Dike seepage discharge as monitored non-contact water).

Managed Surface Water and Seepage

- East and West Portage Diversion Ditches;
- Waste Rock Storage Facility seepage (historical) towards NP-2; and
- Mill seepage under the Assay Road towards Third Portage Lake.

Construction Activities

- Minor in 2025: Water management infrastructure construction and associated blasting at the former Quarry 23.

While dust deposition was identified as a potential source of impacts, results of air quality monitoring to date indicate neither TSP nor onsite dustfall results have regularly exceeded available FEIS predictions or long-term (annual or 30-d) regulatory guidelines. This potential source is therefore considered unlikely to be a major contributor to any unpredicted changes in aquatic systems, and is not considered further.

Similarly, groundwater monitoring continues to indicate that groundwater quality is not likely to have a significant effect on receiving environment surface water quality since pit inflows are the only inferred direction of flow at this time. As a result, this potential source of impacts to surface water is not considered further.

2.3.1 Changes in Conventional Parameters, TDS, and Major Ions

In 2025 and similar to previous years, CREMP analyses identified trigger exceedances and statistically significant changes relative to baseline/reference conditions at one or more near-field areas including TPE, TPN, SP and WAL for: conductivity, hardness, alkalinity, total dissolved solids (TDS), and constituent major ions (calcium, magnesium, potassium). These trends have been observed for many years, and as further explored below, while they are considered to be mine-related, the measured concentrations in 2025 remain relatively low and there is no evidence to suggest concentrations are increasing year over year, or that the observed concentrations would results in adverse ecological effects.

Notwithstanding, consideration was again given here to evaluate and classify results for these parameters across AEMP programs. No triggers are applicable to this variable group outside the CREMP, so Table 2 is restricted to that program, but relevant monitoring results across programs are reviewed further below as they relate to the source evaluation (Section 2.3.1.1) or effects evaluation (Section 2.3.1.3).

Table 2. Summary of monitoring results across AEMP programs related to conventional parameters, TDS, and constituent major ions in surface water.

Note: No triggers are applicable to this stressor variable group outside the CREMP.

Stressor Variable Group: Conventional Parameters and Major Ions					
Program	**Magnitude**	**Spatial Scale**	**Temporal Trend**	**Causation**	**Uncertainty**
CREMP	1	Large	Stable	High	?

Magnitude:
n/a – not evaluated/no applicable trigger
0 – no exceedance
1 – early warning trigger exceeded, or change from baseline
2 – management threshold exceedance (or change from baseline exceeding magnitude of concern)

Spatial Scale:
n/a – no magnitude of effect, therefore not evaluated
small – localized scale
moderate – sub-basin to basin scale
large – basin to whole lake scale

Temporal Trend Indicators:
n/a – no magnitude of effect, therefore not evaluated
Stable – no changes year-over-year
Increasing – year-over-year increases
Decreasing – year-over-year decreases

Causation Ratings:
n/a – no magnitude of effect, therefore not evaluated
Low – no evidence for a mine-related source
Moderate – some likelihood of a mine-related source
High – the source of the problem is very likely to be mine-related

Uncertainty Ratings (confidence in all other findings):
? – low uncertainty
?? – moderate uncertainty
??? – high uncertainty

The conceptual site model presented in Table 3 assists in understanding the possible linkages (i.e., effect to receptors from the source). All available monitoring results for 2025 related to the identified potential sources/transport pathways, stressors, and receptors are reviewed in text format below.

Table 3. Integrated conceptual site model for AEMP assessment of observed changes in conventional parameters, TDS, and constituent major ions at the Meadowbank site.

Source	Transport Pathways	Exposure Media: Medium / Stressor	Exposure Media: Narrative	Exposure Media: Magnitude	Exposure Media: Spatial Scale	Exposure Media: Link to Source	Effects Measures: Receptor	Effects Measures: Narrative	Effects Measures: Magnitude	Effects Measures: Spatial Scale	Effects Measures: Link to Stressor
		Surface Water									
Effluent, Managed Non-Contact Water, Seepage? →	Effluent discharge, run-off to surface water →	Conductivity, hardness, major ions, TDS	CREMP lakes close to the mine (Third Portage, Second Portage, Wally) have higher concentrations of dissolved solids and constituent major ions compared to baseline/reference conditions. There are no effects-based thresholds for these parameters.	T, SD	2+	Strong (see text) →	**Primary Production** [a]Chlorophyll a [a]Phytoplankton biomass [a]Phytoplankton taxa richness [c]Sub-lethal toxicity (growth inhibition)	Biomass/Richness: No consistent (year-over-year), statistically significant changes above trigger effect sizes (20%). Toxicity: No growth inhibition in EEM reporting (2024). Rather, growth stimulation occurs in 90% effluent.	0	N/A	N/A
							Secondary Production [c]Zooplankton sub-lethal toxicity (*Ceriodaphnia dubia*) [c]Zooplankton acute lethality (*Ceriodaphnia dubia, Daphnia magna*)	Targets for sublethal toxicity and acute lethality were met in the last EEM reporting cycle (2024).	0	N/A	N/A
							[a,c]Benthic invertebrate density and richness	[c]Increased density in effluent discharge sampling area compared to baseline/reference (2017, 2020; 2024 IOC). [a]No statistically significant changes in abundance/richness at CREMP sampling areas (further from source).	T, SD	2+	Strong (see text)
							Fish [c]Sublethal toxicity (Fathead minnow) [c]Acute lethality (Fathead minnow, Rainbow trout) [d]Presence/absence	Toxicity: Targets for sublethal toxicity and acute lethality were met in the last EEM reporting cycle (2024). Presence: Fish presence around East Dike faces was confirmed (2021 HCMP); no apparent changes from baseline for fish communities in Dogleg Ponds (2025 HCMP)	0	N/A	N/A

Associated monitoring program:

a	Core Receiving Environment Monitoring Program
b	Water Quality and Flow Monitoring
c	Effluent-Related Monitoring
d	Habitat Compensation Monitoring
e	Groundwater Monitoring
f	AWAR and Quarries Water Quality Montoring
g	Tailings Pore Water Monitoring
h	Blast Monitoring

Magnitude

0	No trigger exceedance
T	Exceeds early-warning trigger.
TT	Exceeds effects-based threshold.
SD	Statistically significant difference from baseline/reference
Qual	Qualitative assessment

Spatial Extent

1 - Occurs at one near-field sampling area only
2+ - Multiple near-field areas
All - Extends to far-field areas

2.3.1.1 Source Evaluation

Since the identified water quality parameters (conductivity, hardness, total dissolved solids, alkalinity and major ions) are strongly inter-related, conductivity has been used as an indicator parameter for source evaluations in this review, because it is commonly measured across all monitoring locations and programs. While CREMP conductivity triggers (27 µS/cm for Second and Third Portage Lakes and 37 µS/cm for Wally Lake; set at the 95th centile of baseline data), do not specifically apply to effluent or managed surface water results, they are used here to further understand the potential for a source to be contributing to observations of water quality changes in the receiving environment programs. All results for water quality monitoring locations referenced here are provided in Section 8.5 of the 2025 Annual Report to the NIRB.

Effluent Monitoring Results

In recent years until 2025, the only source of effluent discharge for the Meadowbank site was East Dike seepage, which was released to Second Portage Lake as monitored non-contact water. In 2025, effluent was also discharged from the Vault Attenuation Pond to Wally Lake. Annual average conductivity (field measured) for both the East Dike seepage effluent and Vault Attenuation Pond effluent in 2025 (102 µS/cm and 106 µS/cm, respectively) exceeded the CREMP water quality triggers of 27 and 37 µS/cm. These results suggest that effluent discharge may be continuing to contribute to the observed water quality changes in the CREMP near-field lakes, as determined previously and noted over the years in CREMP reports. The influence of effluent release on major ions in the receiving environment was also concluded through analysis of all available historical data in the 2024 EEM Cycle 5 Interpretive Report (see 2024 Annual Report to the NIRB).

Managed Surface Water Monitoring Results

The East and West diversion ditches are designed to redirect runoff from the northern area watershed away from mine facilities, to Second Portage Lake via NP-2 (East diversion ditch) and to Third Portage Lake (West diversion ditch). Annual average field-measured conductivity in both diversion ditches (East, ST-5: 160 µS/cm; West, ST-6: 149 µS/cm) commonly exceeded the CREMP trigger (27 µS/cm). Again, although the trigger does not apply directly to these locations, it provides a benchmark and suggests these are potential sources of the elevated conductivity and related parameters (compared to baseline conditions) observed in CREMP results in Second and Third Portage Lakes.

Water quality monitoring also continues in two near-shore lake locations (NP-2, Third Portage Lake) in response to seepage events, to confirm that mitigation measures to eliminate seepage pathways remain effective. Conductivity in 2025 in NP-2, which directly receives East Diversion Ditch run-off and ultimately reports to Second Portage Lake, was field-measured at 281 µS/cm (annual average). Annual average conductivity at the near-shore Third Portage Lake location TPL-Assay was field-measured at 161 µS/cm. Since conductivity results for these surface water locations receiving managed non-contact water or runoff exceed the CREMP trigger (95th centile of baseline), they may also be potential sources of the elevated conductivity and related parameters observed in the CREMP results for Second and Third Portage Lakes.

Summary

Based on these results, the most likely source of the changes to conductivity and related parameters identified through the CREMP continues to be effluent discharge and potentially, managed non-contact water runoff (likely current and historical).

2.3.1.2 Exposure Evaluation

Annual average conductivity (tracked here as an indicator variable) was measured at 33 - 51 µS/cm in near-field CREMP monitoring locations for Second Portage Lake and Third Portage Lake in 2025. These results just exceed the CREMP trigger value set at the 95th centile of baseline concentrations (27 µS/cm) and are statistically greater than baseline/reference in the BACI analysis. Condutivity results for Wally Lake in 2025 did not exceed the CREMP trigger (37 µS/cm). Long-term trend analysis completed for data through 2021 indicated that conductivity and the other parameters of interest here (hardness, calcium, magnesium, total alkalinity, and TDS) were generally stable from 2014 to 2021. A full description of the long-term trend analysis and results was included in the 2021 CREMP report. Results in 2025 were similar to other recent years.

Exposure area water quality sampling for the EEM program was also conducted monthly in February to April (Second Portage Lake discharge location; average of 30 µS/cm) and September-October (Wally Lake discharge location; average of 71 µS/cm).

2.3.1.3 Effects Evaluation

A thorough literature review in the 2019 CREMP report indicated that concentrations of these parameters at Meadowbank remained well below those associated with adverse effects to aquatic life. Measured concentrations of these parameters have not increased since that time.

The conclusions of the 2019 literature review continue to be supported by monitoring results for aquatic receptors to date. Results of all associated monitoring programs for receptors of interest shown in Table 1 in 2025 or the last available year are summarized as follows:

- The 2024 Cycle 5 EEM Interpretive Report determined that historical effluent at the tested concentration (90%) did not inhibit phytoplankton growth but rather stimulated it in laboratory-based sublethal toxicity testing. The effect could not be attributed to any specific parameter.

- However, as reported in the 2025 CREMP Report, no pervasive mine-related changes in phytoplankton biomass or communities in the receiving environment have been observed to date for Meadowbank receiving lakes (Before-After Control-Impact or "BACI" analysis).

- The Cycle 5 EEM Interpretive Report also found considerable support that increased benthic invertebrate density in effluent exposure areas has been caused by mine-related changes in conductivity (i.e. major ions) from effluent release. Through this program, increased density (compared to baseline/reference) above the critical effect size was observed at the Wally Lake effluent exposure area in 2017, and at the Second Portage Lake near-field exposure area in 2020. An increase was also observed at the Second

Portage far-field exposure area in 2020, but residuals were within the normal range of variation.

- Benthic invertebrate community sampling is also performed through the CREMP, using a statistically robust BACI analysis. Sampling stations are further from effluent release areas than EEM near-field exposure stations, but the EEM Second Portage far-field station corresponds to the CREMP location.

- In the context of interpreting the Cycle 5 EEM results, it is noted that the CREMP BACI analysis of 2020 benthic invertebrate density comparing the exposure area SP-FF to the reference area INUG, indicated no significant differences in benthic invertebrate density (2020 CREMP Report), and this continues to be the case (2025 CREMP Report). BACI is a robust experimental design that considers temporal changes in both the exposure and reference areas.

- Finally, while the last HCMP program results for lakes receiving effluent (2021) indicated that periphyton growth on dike faces continues to be slow (as expected in Arctic ultraoligotrophic lakes), interstitial water quality meets CCME criteria, and fish presence around the dike faces has been confirmed. Fish presence has also been confirmed for ponds receiving managed non-contact water ouflow (NP-2, Dogleg Pond; 2025 HCMP Report).

Summary

Measured concentrations of conductivity and related parameters remain above baseline/reference values in Meadowbank near-field receiving environment lakes. These changes appear most likely related to effluent discharge, and linked to stimulated benthic invertebrate production in areas immediately adjacent to effluent diffusers, though some portion of the observed changes may also be natural variability. Concentrations of the water quality parameters are well below those associated with adverse effects to aquatic life. While spatial extents of the observed changes in benthic invertebrate density have not been specifically examined, it may be inferred that they do not extend significantly beyond the near-field effluent discharge area since increased density has not been observed at CREMP sampling stations in the same lakes.

2.3.1.4 Management Actions

Regularly scheduled routine monitoring and management activities related to water quality and aquatic receptors in the receiving environment will continue in 2026. No adaptive management is planned at this time in relation to the observed changes in conventional parameters, TDS, and contituent major ions for near-field lakes.

SECTION 3 • WHALE TAIL SITE

3.1 SUMMARY OF RELEVANT ONSITE ACTIVITIES

In 2025, open pit and underground mining continued at the Whale Tail site. Regular related activities included blasting for ore extraction, trucking and placement of waste rock in designated storage facilities. Ore is transported along the Whale Tail Haul Road to the Meadowbank site for processing.

In 2025, all effluent discharge to the receiving environment at the Whale Tail site occured via the Attenuation Ponds, to either Kangislulik Lake or Whale Tail South Basin. Discharge to Whale Tail South Basin occurred from April 13 through June 28, from October 6 through December 13, and from December 27 through December 30. Discharge to Kangislulik Lake occurred from July 6 through September 27.

Water levels in the Whale Tail South area remain elevated as part of the water management strategy, with passive outflow via the Whale Tail South Channel. Flooding of this area was initiated in 2019.

No construction activities or reportable spills with potential to impact on receiving aquatic environments occurred in 2025.

3.2 SUMMARY OF RESULTS OF AEMP MONITORING PROGRAMS

In 2025, monitoring according to the AEMP at the Whale Tail site included the:

- Core Receiving Environment Monitoring Program and targeted effects-assessment studies, when required
- Mercury Monitoring Program;
- Minesite Water Quality and Flow Monitoring;
- Effluent-related monitoring under the Metal and Diamond Mining Effluent Regulation (MDMER);
- Fish Habitat Offsets Monitoring;
- Groundwater Monitoring;
- WTHR and quarries water quality monitoring under the Freshet Action Plan and Erosion Management Plan;
- Blast Monitoring; and
- Air Quality and Dustfall Monitoring.

The results of these monitoring programs are integrated in the AEMP and assist in the evaluation of potential effects of mining activities on the aquatic environment.

Programs that are part of the AEMP model but were not required to be conducted in 2025 for the Whale Tail site include:

- Dike Construction and Dewatering Monitoring; and
- Fish-Out Studies.

For each AEMP monitoring program conducted in 2025, a summary of trigger/threshold or guideline exceedances and observed effects (changes in receptor groups) is provided in Table 4. Across all programs, consistent trigger or guideline exceedances for stressor variables were only identified through the CREMP, for water quality parameters (nutrients and water-borne toxicants). Briefly, CREMP results indicate an increase in the measured parameters compared to baseline/reference concentrations only, and do not indicate an exceedance of thresholds for impacts to aquatic life (e.g. CCME Water Quality Guidelines for the Protection of Aquatic Life).

Results of the AEMP monitoring programs are described in text below, and the integrated evaluation of sources, exposure, and effects, along with any adaptive management actions are provided in Section 3.3.

Table 4. Summary of trigger/guideline exceedances for AEMP programs at the Whale Tail site in 2025.

	AEMP Program									
	CREMP	Mercury Monitoring Program	Dike Construction & Dewatering Monitoring	Fish Habitat Offsets Monitoring	Effluent-Related Monitoring [4]	Minesite Water Quality and Flow Monitoring	Fish-Out Studies	WTHR Water Quality Monitoring	Blast Monitoring	Groundwater Monitoring [1]
Stressor Variables										
Suspended solids	○	NA		NA	○	○		○	NA	NA
Sediment deposition	NA	NA		NA	NA	NA		○	NA	NA
Water-borne toxicants	◍	○		NA	○	NA		NA	NA	○
Sediment toxicants	NA	○		NA	NA	NA		NA	NA	NA
Nutrients	◍	NA		NA	○	NA		NA	NA	NA
Other physical stressors	NA	NA		NA	NA	NA		NA	○	NA
Effects Variables										
Phytoplankton	○	NA		NA	NA	NA		NA	NA	NA
Zooplankton	NA	NA		NA	○	NA		NA	NA	NA
Fish	NA	○		NA	○	NA		NA	NA	NA
Benthic invertebrates	◍ [2]	NA		NA	NA	NA		NA	NA	NA
Periphyton	NA	NA		NA	NA	NA		NA	NA	NA
Fish habitat	NA	NA		NA	NA	NA		○ [3]	NA	NA

Notes:

1- No limits apply. Certain parameters are compared to FEIS assumptions and MDMER effluent criteria for reference.

2 - Increase in abundance and/or richness; attributed to combined effects of mining, climate, and natural variability.

3 - Road material deposition through bridge at water crossings. Potential for impacts to fish habitat, remedial actions scheduled.

4 - Monthly sublethal toxicity testing for effluent with an alga, a zooplankton, a macrophyte and a fish is also conducted as required under MDMER and reported on a 3-year cycle

○ Stressor variables: No trigger/guideline exceedance or significant difference from baseline/reference
Effects variables: No apparent effects or unlikely mine-related

◍ Stressor variables: Trigger or guideline exceedance (and significant difference from baseline/reference where available)
Effects variables: Possible mine-related effects (discussed in text)

● Observed effects, likely mine-related (discussed in text)

Note: Results for air quality are reviewed to inform trends assessments, but do not have triggers sent in the context of effects on the aquatic environment, so are not included in this table.

3.2.1 CREMP

As for the Meadowbank site, the CREMP is the overarching annual and long-term aquatic receiving environment monitoring program for the Meadowbank Complex. Through this program, mine-related impacts are tracked through evaluation of water quality, sediment quality, and lower trophic level receptors at a suite of near-field, mid-field, and far-field lakes using site-specific trigger/threshold values as well as a statistically robust before-after-control-impact (BACI) analysis model. The CREMP report for 2025 is provided as an appendix of the Annual Report to the NIRB. Highlights in the AEMP context are provided below.

The 2025 Whale Tail CREMP evaluation included sampling programs at all routine near-field (WTS, KAN, NEM), mid-field (A20, A76), and far-field (DS-1) stations for the Whale Tail site, along with reference sites INUG and PDL.

Water Quality: Briefly, statistically significant changes from baseline/reference conditions were observed in some near-field and/or mid-field lakes for: hardness, alkalinity, conductivity, TDS and constituent major ions (calcium, magnesium, potassium, and sodium); some nutrients (TKN, TOC, DOC), and lithium. Similar to results seen over the years at the Meadowbank study lakes, these trends represent increases above baseline/reference conditions only; none of these analytes have effects-based guidelines for the protection of aquatic life. Notably, annual average total phosphorus concentrations declined below the CREMP trigger for all study lakes in 2025 for the first time since 2018. This parameter was predicted to potentially remain elevated above the trigger (0.0045 mg/L) in both WTS and KAN into the closure period.

Sediment: Sediment chemistry analysis was not required in 2025, other than TOC which is evaluated annually to support interpretation of benthic invertebrate results.

Phytoplankton: Similar to 2024, phytoplankton biomass showed no significant change from baseline/reference in 2025. Increased primary production was predicted in the FEIS for the operations period, and was generally observed in the first few years of mining in near-field lakes, but this metric appears to have stabilized. Phytoplankton taxa richness was within historical ranges and not statistically different from baseline/reference conditions. These results align with generally lower nutrient concentrations observed this year compared to 2024.

Benthic Invertebrates: The 2025 CREMP BACI analysis for benthic invertebrate abundance and taxa richness tested for changes relative to baseline/reference conditions for four time periods: the current year, last two years, last three years, and last four years. For all time periods, there were significant increases in total abundance and taxa richness at KAN and NEM compared to baseline/reference. There were also significant increases in both metrics at WTS and A20 for a subset of the time periods. These changes are considered likely due to a combination of mine activity, differences in impacts of regional climatic trends on a lake-by-lake basis, as well as natural variability.

3.2.2 Mercury Monitoring Program

Complete results of the 2025 Mercury Monitoring Program (MMP) are provided as an appendix of the 2025 Annual Report, and summarized here.

The purpose of the MMP is to assess changes in mercury concentrations caused by the creation of the Whale Tail Impoundment (flood zone) following the construction of the Whale Tail Dike in September 2018, which raised water levels in the area, connecting several lakes. The MMP was designed to monitor mercury dynamics in key components of the ecosystem to verify FEIS predictions for mercury concentrations in water, sediment, and fish tissue. The scope of the 2025 program included surface water and sediment sampling at various locations within the Impoundment (Whale Tail South), downstream lakes (Kangislulik Lake), and at local reference lakes. Analytical results for small-bodied fish tissue samples collected in 2024 were also reported.

In 2025, surface water concentrations of mercury were less than available FEIS predictions and CCME Water Quality Guidelines for the Protection of Aquatic Life (26 ng/L for total mercury, 4 ng/L for methylmercury). Total and methylmercury concentrations in the impoundment increased after flooding until 2022 or 2023. Results for 2025 suggest concentrations are decreasing from that peak. At the next downstream lake (Kangislulik Lake), mercury concentrations in surface water were similar to baseline.

Sediment was sampled in depositional areas of the MMP lakes in 2025. Concentrations of total mercury in the Impoundment and downstream exposure area samples were less than CCME sediment quality guidelines, and were similar to baseline/reference conditions. In 2026, sediment will be sampled from both depositional zones and inundation zones (former terrestrial zones).

Small-bodied fish sampling is not required under the MMP, but samples were collected from 2018 to 2024 in some or all MMP lakes to improve understanding of mercury cycling dynamics. In 2024, tissue concentrations in Slimy sculpin continued to increase in Impoundment lakes, whereas concentrations in Ninespine stickleback appeared to be stabilizing.

Lake trout are the primary fish species of interest in the MMP, and were last required to be evaluated in 2023, with follow up analyses also completed in 2024. Those results showed concentrations within the range of FEIS predictions.

3.2.3 Water Quality and Flow Monitoring

Results of water quality analyses for managed non-contact water and seepage to the receiving environment are discussed here in relation to regulatory limits. Complete results of the Water Quality and Flow Monitoring program are provided in Section 8.5 of the 2025 Annual Report to the NIRB, and are used as necessary to inform the integration of monitoring results.

Whale Tail South Channel (ST-WT-13)

Water flowing through the Whale Tail South Channel was sampled on a monthly basis during the open water season. Applicable NWB Water License limits for this station include effluent water quality limits for TSS of 15 mg/L for the maximum monthly mean and 30 mg/L for the maximum concentration in a grab sample. No results exceeded these limits in 2025.

IVR Diversion Channel (ST-WT-37)

The IVR Diversion Channel conducts non-contact water from the North-East watershed towards Nemo Lake. This station is monitored as ST-WT-37. Applicable NWB Water License limits for TSS apply (15 mg/L for the maximum monthly mean and 30 mg/L for the maximum concentration in a grab sample). No results exceeded these limits in 2025.

Lake Outlets (ST-WT-14 and ST-WT-15)

While considered elements of the receiving environment rather than typical managed non-contact water, the outlets for Lakes A16 (aka Kangislulik Lake; ST-WT-15) and lake A15 (ST-WT-14) are sampled under the Water Quality and Flow Monitoring Plan, according to NWB Water License criteria. No license limits apply. Results of this evaluation are used as necessary to inform the integration of AEMP monitoring results below.

3.2.4 Effluent-Related Monitoring

MDMER monitoring requirements include monitoring effluent (weekly/quarterly chemistry analysis, daily discharge volume, monthly toxicity testing), receiving environment water quality (4x/year at discharge and reference areas), and receiving environment biological monitoring studies (fish and/or benthic invertebrate monitoring on a three-year cycle). Effluent quality results for 2025 are summarized here in relation to regulatory criteria (MDMER/NWB Water License) and full results (2025 Annual Report Sections 8.3 and 8.5) are used as necessary to inform the integration of AEMP monitoring results.

Discharge to Kangislulik Lake (ST-MDMER-8/WT-WT-2a)

Effluent discharge to Kangisliluk Lake occurred from July 6 through September 27, 2025. The final discharge point is reported as station ST-MDMER-8/WT-WT-2a.

All results of weekly effluent chemistry sampling were in compliance with MDMER/NWB Water License criteria for water quality, including tests for acute lethality with Rainbow trout and *Daphnia magna*. EEM sub-lethal and acute lethality tests with four test species (*Ceriodaphnia dubia*, fathead minnow, *Lemna minor*, *Pseudokirchneriella subcapitata*), were conducted three times in 2025 (July 7, August 4, September 8). Two tests showed sublethal effects for *Ceriodaphnia dubia*, and all other test results showed no sublethal effects or acute lethality. Complete results will be analyzed in context as part of the Cycle 3 EEM Biological Monitoring Interpretive Report (due in July, 2027), along with receiving environment water quality analyses.

The Cycle 2 EEM Biological Monitoring Interpretive Report was provided in July, 2024, with evaluation of data collected between 2021 and 2023. Results from sublethal toxicity tests (2021 – 2023) indicated that the Whale Tail effluent had no detectable effects on the growth or survival of Fathead Minnow. Mine effluent concentrations of 2.95% to >100% had detectable effects on reproduction of *Ceriodaphnia dubia*, which is not consistent with the results of the in situ benthic invertebrate community study (2023). No inhibitory effects were observed for *Pseudokirchneriella subcapitata* or *Lemna minor* exposed to effluent samples in laboratory toxicity tests. The fish population survey examined Lake Trout and Slimy Sculpin as sentinel species, with fish collected from Kangislulik Lake and two reference lakes (Lake 8 and D1) in 2023. Four growth-related effect indicators were assessed for each species. For Lake Trout, one metric (liver weight at body weight) was reduced for the effluent-impacted lake (Kangislulik), but the change was less than the critical effect size of 25%. Slimy Sculpin were lighter at a given age than reference lakes, but the difference exceeded the critical effect size for just one reference lake of the two. In the benthic invertebrate community survey, various indices of community composition were analyzed and one (density) showed an increase from baseline/reference above the critical effect size. This effect also occurred in Cycle 1 (2020 sampling). Richness was also significantly different, though the critical effect size was not exceeded. Based on these results, an Investigation of Cause is proposed for Cycle 3, along with routine monitoring for fish. Water quality testing in the EEM study indicated no exceedance of CCME Water Quality Guidelines.

Discharge to Whale Tail South (*ST-MDMER-11/ST-WT-24)*

Effluent discharge to Whale Tail South Basin occurred from April 13 through June 28, from October 6 through December 13, and from December 27 through December 30. The final discharge point is reported as station ST-MDMER-11/ST-WT-24. All results were in compliance with MDMER/NWB Water License criteria for water quality, including acute lethality toxicity tests for Rainbow Trout and *Daphnia magna*.

3.2.5 Fish Habitat Offset Monitoring

The complete 2025 Fish Habitat Offsets Monitoring Report for the Whale Tail Mine is provided as an appendix of the Annual Report and summarized here.

Monitoring of currently constructed fish habitat offsets (flood zone habitat) was not required in 2025. Nevertheless, water level monitoring and water quality monitoring under the CREMP continued. Flood zone water levels remained similar to previous years and water quality within the flood zone remained suitable for aquatic life based on CREMP criteria.

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3.2.6 Groundwater Monitoring

The complete Groundwater Monitoring Report is provided as an appendix of the 2025 Annual Report, and the program is summarized here.

For the Whale Tail Mine, groundwater monitoring was conducted in 2025 according to the Groundwater Monitoring Plan. This monitoring program exists primarily to update site water quality and water balance models, and support water management activities and water quality planning for eventual pit reflooding. Currently, groundwater inflow quantity and quality to the

Whale Tail Pit are assessed through the Westbay System monitoring well installation, and analysis of sump and seepage samples.

Westbay well water quality results for TDS are compared to FEIS assumptions, and do not deviate significantly. Arsenic, which is a constituent of interest in Whale Tail ore and waste rock, continues to occur at low concentrations consistent with previous reliable data from this well. Radium-226 is below MDMER effluent criteria. Overall, no changes to the mine site water quality model or water management plan are considered necessary based on 2025 groundwater monitoring data.

Currently, since pit inflows are the inferred direction of groundwater movement at the Whale Tail Mine, groundwater quality is not likely to have a significant direct effect on receiving environment surface water quality, and is not considered further in the AEMP analysis at this time.

3.2.7 Whale Tail Haul Road and Quarries Water Quality Monitoring

Under the Freshet Action Plan and Erosion Management Plan, visual inspections occur daily or weekly for Whale Tail Haul Road water management infrastructure including culverts, ditches, bridges, and quarries.

Briefly, in 2025, no erosion concerns that required mitigation actions were identified during visual inspections for Whale Tail Haul Road water management infrastructure (e.g. scour, bed erosion, etc.). Based on visual assessments for turbidity, no water quality samples were required to be collected for measurement of TSS and no turbidity management measures were required to be installed (e.g. straw booms or woodchip booms).

In fall 2024, deposition of road material in streams at bridge crossings along the WTHR was identified. Road material is apparently being entrained by passing vehicles and passing over the bridge deck. Agnico Eagle has proposed a remedial action plan and is working with DFO to eliminate this potential impact.

3.2.8 Blast Monitoring

A Blast Monitoring Report is produced annually and provided as an appendix of the Annual Report. The 2025 program and results are summarized here.

In 2025, 95 blasts occurred and were monitored at the IVR Pit, and 132 blasts occurred and were monitored at the Whale Tail Pit. In addition, 18 blasts were required to be monitored for the underground mine. No blasts exceeded DFO’s peak particle velocity (PPV) limit of 13 mm/s or the instantaneous pressure change (IPC) limit of 50 kPa.

3.2.9 Air Quality and Dustfall Monitoring

The complete 2025 Air Quality and Dustfall Monitoring Report is provided as an appendix of the Annual Report and results in the AEMP context are summarized here. Across all parameters evaluated (suspended particulates, NO_2, dustfall), dustfall and annual average TSP are considered most relevant to the AEMP analysis. At the Whale Tail site, TSP and dustfall (30-d average) are measured year-round at one onsite location, and during the summer season dustfall is measured at three transects along the Whale Tail Haul Road. Dust suppressant is applied along the entire length of this road.

In 2025, all onsite and WTHR monitoring results for dustfall met management thresholds, which are equivalent to Alberta Environment guidelines for recreational or industrial areas. It is noted that these guidelines relate to nuisance/aesthetic concerns, not environmental quality. For the purposes of the AEMP evaluation, trends in dustfall are also reviewed to help understand potential linkages to observed exceedances of aquatic triggers/guideline values. Visual assessment of trends to date (since 2018) indicates that while occasional peaks occur, rates of dustfall appear to have been stable over time relative to guideline values, and across monitoring locations. Annual average TSP met FEIS predictions and regulatory guidelines in 2025.

3.3 INTEGRATION OF MONITORING RESULTS

According to the AEMP, the results of the monitoring programs were integrated in a mechanistic fashion with a thorough review of results to identify any patterns among the relevant receiving environment monitoring programs. For groups of stressor variables where triggers or guidelines were consistently exceeded in 2025 (summarized in Section 3.2), a discussion of results across AEMP programs is provided here to explore spatial scale, temporal trends, causation, and uncertainty. Patterns among the programs are characterized using an issue-specific conceptual site model, which assists in the evaluation of the transport pathways, provides information on specific media (identifies stressors) and identifies receptors of concern (effects variables).

In 2025, water quality (water-borne toxicants, specifically: nutrients, major ions and related parameters, and lithium) was the only stressor variable for which associated triggers or guidelines were consistently exceeded. Across effects variables in AEMP monitoring programs, only changes in benthic invertebrates were identified. Those results are discussed in context for each stressor group evaluation below.

The following onsite activities were identified primarily as having the potential to impact water quality in the receiving environment, and are considered in the source evaluations below:

Flood-Related (Allochthonous) Inputs

- Inputs from Whale Tail South terrestrial flooding to WTS and lakes downstream via the South Whale Tail Channel (current and/or historical)

Effluent Discharge

- Effluent discharge from the Attenuation Ponds to Whale Tail South (current and/or historical)
- Effluent discharge from the Attenuation Ponds to Kangislulik Lake (current and/or historical)

Managed Surface Water and Seepage

- IVR Diversion Channel non-contact water discharge towards Nemo Lake
- WTS discharge via the South Whale Tail Channel to Kangislulik Lake

Construction Activities

- Historical. None in 2025.

While dust deposition was identified as a potential source of impacts, results of air quality monitoring to date indicate neither TSP nor onsite dustfall results have regularly exceeded available FEIS predictions, monitoring thresholds, or long-term (annual or 30-d) regulatory guidelines. Since monitoring began, measured rates of TSP and dustfall onsite have generally remained stable. This potential source is therefore considered unlikely to be contributing any unpredicted impacts to surface water.

In addition, groundwater monitoring continues to indicate that groundwater quality is not likely to have a significant effect on receiving environment surface water quality since pit inflows are the only inferred direction of flow at this time. As a result, this potential source of impacts to surface water is not considered further.

3.3.1 Changes in Nutrients (TKN, TOC, DOC)

Similar to recent years, mean annual concentrations of total Kjeldahl nitrogen (TKN), and total and/or dissolved carbon (TOC and DOC) in 2025 exceeded their respective CREMP triggers in all CREMP lakes except NEM. Differences were statistically greater than baseline/reference in the BACI analysis in all lakes except DS-1 for TKN, and in WTS and/or A20 for TOC and DOC. Notably, mean annual concentrations of total phosphorus did not exceed the CREMP trigger in any lake for the first time since 2018.

Otherwise, these trends are generally consistent with findings in previous impact years and FEIS Addendum predictions for increased nutrient concentrations. Notwithstanding, consideration was again given here to evaluate and classify results for these parameters across AEMP programs.

Table 5. Summary of monitoring results across AEMP programs related to nutrients in 2025
Note: No triggers are applicable to this variable group outside the CREMP and effluent-related monitoring.

Stressor Variable Group: Nutrients					
Program	**Magnitude**	**Spatial Scale**	**Temporal Trend**	**Causation**	**Uncertainty**
CREMP	1	Large	Stable	Moderate	?
Effluent-Related Monitoring	0	n/a	n/a	n/a	n/a

Magnitude:
n/a – not evaluated/no applicable trigger
0 – no exceedance
1 – early warning trigger exceeded, or change from baseline
2 – management threshold exceedance (or change from baseline exceeding magnitude of concern)

Spatial Scale:
n/a – no magnitude of effect, therefore not evaluated
small – localized scale
moderate – sub-basin to basin scale
large – basin to whole lake scale

Temporal Trend Indicators:
n/a – no magnitude of effect, therefore not evaluated
Stable – no changes year-over-year
Increasing – year-over-year increases
Decreasing – year-over-year decreases

Causation Ratings:
n/a – no magnitude of effect, therefore not evaluated
Low – no evidence for a mine-related source
Moderate – some likelihood of a mine-related source
High – the source of the problem is very likely to be mine-related

Uncertainty Ratings (confidence in all other findings):
? – low uncertainty
?? – moderate uncertainty
??? – high uncertainty

The conceptual site model presented in Table 6 assists in understanding the possible linkages (i.e., effect to receptors from the source). All available monitoring results for 2025 (or most recent year) related to the identified potential sources/transport pathways, stressors, and receptors are reviewed in text format below.

Table 6. Integrated conceptual site model for AEMP assessment of observed changes in nutrients at the Whale Tail site (2025 results unless indicated).

Source | **Transport Pathways** | **Exposure Media** | **Effects Measures**

Source: Effluent, Terrestrial Inputs? → Transport Pathways: Effluent discharge, Flooding →

Exposure Media

Surface Water

Medium / Stressor	Narrative	Magnitude	Spatial Scale	Link to Source
TKN, TOC, DOC	CREMP triggers were exceeded along with statistically significant increases compared to baseline/reference for nutrient parameters in WTS, A20, KAN, and/or A76. There are no effects-based thresholds for these parameters.	T, SD	2+	Moderate (see text)

→

Effects Measures

Receptor	Narrative	Magnitude	Spatial Scale	Link to Stressor
Primary Production				
[a]Phytoplankton biomass	No differences in biomass.	0	N/A	N/A
[a]Phytoplankton taxa richness	No differences in taxa richness.	0	N/A	N/A
[d]Periphyton biomass	Seasonal growth on floating artificial substrate appears greater in WTS and A20 compared to reference lakes (2023).	Qual	N/A	N/A
[c]Effluent sub-lethal toxicity (algal and macrophyte growth inhibition)	No growth inhibition in the EEM Cycle 2 (2021 - 2023 data).	0	N/A	N/A
Secondary Production				
[c]Zooplankton sub-lethal toxicity (*Ceriodaphnia dubia*) [c]Zooplankton acute lethality (*Ceriodaphnia dubia, Daphnia magna*)	Inhibition of reproduction in *C. dubia* in 3 of 6 tests for EEM Cycle 2 (2021 - 2023 data). Not consistent with in-situ invertebrate study results. No acute lethality in EEM Cycle 2 (*C. dubia*, 2021 - 2023) or MDMER toxicity testing (*D. magna*).	0	N/A	N/A
[a,c]Benthic invertebrate density and richness	[c]Increased density in effluent discharge area in KAN (2023). [a]Increased abundance and/or richness at some CREMP lakes (especially NEM, KAN).	TT, SD	2+	Low - Moderate (see text)
Fish				
[c]Sublethal toxicity (Fathead minnow) [c]Acute lethality (Fathead minnow, Rainbow trout)	No sublethal toxicity or acute lethality in EEM Cycle 2 (fathead minnow, 2021 - 2023) or MDMER toxicity testing (rainbow trout).	0	N/A	N/A
[c,d]Population metrics (e.g. relative abundance (CPUE), length frequency)	[c]No consistent differences in lake trout or slimy sculpin growth metrics exeeding the critical effect size (KAN vs ref lakes, 2023). [d]Various indices indicate stimulation effect for growth of Lake Trout in flood zone lakes (2023).	SD	N/A	N/A

Associated monitoring program:

a	Core Receiving Environment Monitoring Program
b	Water Quality and Flow Monitoring
c	Effluent-Related Monitoring
d	Fish Habitat Offsets Monitoring
e	Groundwater Monitoring
f	WTHR Water Quality Montoring
g	Mercury Monitoring Program
h	Blast Monitoring

Magnitude

0	No trigger exceedance
T	Exceeds early-warning trigger.
TT	Exceeds effects-based threshold.
SD	Statistically significant difference from baseline/reference
Qual	Qualitative assessment

Spatial Extent

1 - Occurs at one near-field sampling area only
2+ - Multiple near-field areas and/or mid-field areas
All - Extends to far-field areas

3.3.1.1 Source Evaluation

As discussed in CREMP reports, mine-related changes in nutrients in general are considered likely linked to terrestrial inundation as well as effluent discharge (as described in FEIS water quality model predictions). These activities may be summarized as:

Whale Tail South Basin

- Following construction of the Whale Tail Dike, dewatering of Whale Tail North Basin to Whale Tail South Basin (and Kangislulik Lake) occurred primarily in 2019.
- The co-incident rise in water levels in Whale Tail South Basin occurred mainly in 2019, ultimately connecting a suite of flood-zone lakes, including CREMP mid-field lake A20.
- Outflow for the flood-zone lakes is via the constructed South Whale Tail Channel, from A20 to Kangislulik Lake.
- Elevated water levels have been maintained in WTS and the flood-zone lakes with regular freshet-based fluctuations since that time.
- Effluent discharge from mine-site attenuation ponds to WTS has occurred as required since 2019.

Kangislulik Lake

- Effluent discharge to Kangislulik Lake has been ongoing as required since 2019.
- WTS flood-zone waters, with allochthonous inputs due to inundation have flowed through the Whale Tail South Channel into Kangislulik Lake since 2020. Pumping also occurred in fall 2019 prior to channel construction.

Changes in TOC and DOC in 2025 (and previous years) are considered related to allochthonous carbon inputs and/or increased primary productivity associated with the observed increases in nutrients. These parameters are known to be affected by flooding regimes and mine-related causality is not explored further here. In addition, 2025 CREMP discussion suggests a potential climate-related regional increasing trend may be contributing to the observed changes compared to baseline conditions.

TKN is a composite parameter that includes ammonia, nitrate, nitrite, and organic nitrogen compounds. It does not have an effects-based threshold, and CREMP triggers for other nitrogen (N)-containing compounds (ammonia, nitrate, nitrite) were met. Increases in N (as ammonia and nitrate) were predicted in the FEIS. No predictions regarding TKN were made. While increases in ammonia and nitrate have occurred, CREMP results in 2025 did not exceed predictions. Following an initial increase, concentrations of N-containing compounds have generally been stable in WTS, A20, and KAN over the last several years.

Nevertheless, results for N from other AEMP monitoring programs are reviewed here in comparison to the CREMP trigger to help confirm potential sources of nutrients to the receiving environment in 2025. While the CREMP triggers do not specifically apply to effluent, managed surface water, or seepage, available nutrient monitoring results for those sources are compared to CREMP triggers to determine the potential for a source to be contributing to the observed water quality changes in the receiving environment programs.

Managed Surface Water and Seepage Monitoring

No monitored sources of managed non-contact water (e.g. diversion ditches) or seepage report directly to the receiving environment of WTS or Kangislulik Lake, other than the Whale Tail South Channel which connects the two. TKN is not required to be measured at this location (ST-WT-13), but the annual mean concentration of ammonia-N (0.051 mg/L) met the CREMP trigger (0.065 mg/L).

Effluent Monitoring

TKN is measured in effluent as ST-WT-2a (discharge to Kangislulik Lake) and ST-WT-24 (discharge to WTS). Annual average TKN at ST-WT-2a (0.36 mg N/L) and ST-WT-24 (0.45 mg N/L) exceeded the CREMP trigger (0.17 mg/L).

These results suggest that effluent discharge may be continuing to contribute to the observed increase in nitrogen-containing compounds that has occurred in Whale Tail area lakes, as was predicted in the FEIS.

3.3.1.2 Exposure Evaluation

In 2025, annual mean TKN exceeded the CREMP trigger (0.17 mg/L) and was statistically greater than baseline/reference concentrations in WTS, KAN, A20, and A76, with concentrations ranging from 0.18 mg/L to 0.26 mg/L.

TKN is additionally measured monthly during open water at the outlets for Lakes A16 (aka Kangislulik Lake) and A15 (next lake downstream, prior to A76), under the Water Quality and Flow Monitoring Plan. Annual mean concentrations at these locations (0.10 and 0.12 mg N/L) met the CREMP trigger.

3.3.1.3 Effects Evaluation

TKN does not have an effects-based monitoring threshold, so the observed changes are significant only in that they represent an increase compared to baseline/reference values. All three of the other nitrogen-containing compounds assessed through the CREMP have effects-based thresholds, which were not exceeded in 2025. Overall, per the 2025 CREMP Report, nitrogen-containing compounds are not considered a concern for aquatic life at the Whale Tail study lakes.

However, since the potential for increased nutrient concentrations in downstream lakes to further impact primary productivity (and higher trophic levels) was predicted in the FEIS Addendum, and predicted changes were not quantified, observations for receptor groups are summarized briefly here, incorporating results across all applicable AEMP programs. Phosphorus is typically considered the limiting nutrient in these aquatic systems rather than nitrogen, and total phosphorus concentrations remained elevated above the CREMP trigger until recently (2024; as predicted in the FEIS Addendum).

Primary Production

Phytoplankton production is monitored annually through the CREMP. In general, an increase in phytoplankton biomass compared to baseline/reference was observed at the Whale Tail area lakes where flooding and effluent release has occurred each year from the beginning of mine-related influence in 2019 until 2023. Beginning in 2024, biomass has stabilized with no further statistically significant differences in phytoplankton biomass compared to baseline/reference conditions. In general, the CREMP dataset has not suggested any pervasive mine-related changes in phytoplankton taxa richness.

EEM effluent toxicity studies (Cycle 2 report; 2021 – 2023 data) show no impairment of growth endpoint for the tested algae.

Periphyton growth in WTS was monitored through the Fish Habitat Offsets Monitoring Plan in 2022 and 2023. In both years, seasonal growth on artificial substrate samplers appeared greater in flood zone lakes compared to reference, with potentially greater growth in WTS compared to A20. This is in line with measured concentrations of total phosphorus, which were slightly higher in WTS than A20.

Secondary Production

Mine-related impacts to zooplankton are only evaluated through MDMER and EEM effluent toxicity testing, since low statistical power has historically prohibited analysis through the CREMP. In the last EEM interpretive report (2024), all acute toxicity thresholds were met for zooplankton. Inhibition of reproduction in *C. dubia* was reported in 3 of 6 tests, but this was not consistent with in-situ invertebrate study results, which showed an apparent stimulatory effect on density of benthic invertebrates.

Because the stressor is water quality, effects to pelagic receptors are primarily considered here. Effects to benthic invertebrates would be more closely considered in association with any observed changes in sediment quality. However it is noted that the Cycle 2 EEM biological study found increased density of benthic invertebrates in the effluent exposure area in Kangislulik Lake in 2023 compared to reference sites. The 2025 CREMP evaluation similarly found significant increases in benthic invertebrate abundance and taxa richness. Eventual changes in benthic communities due to nutrient inputs were predicted qualitatively in the FEIS. An EEM Investigation of Cause is proposed for 2026 to address the cause of observed changes.

Fish

In the last EEM interpretive report (2024), all effluent toxicity thresholds were met for fish. In the associated EEM population survey (2023), only one fish metric exceeded the critical effect size (25% change) across both species evaluated. Slimy sculpin were lighter in Kangislulik Lake than reference lakes, with the change exceeding the critical effect size for one of the two reference lakes only. This differs from results of the Cycle 1 survey, which found sculpin were longer in Kangislulik Lake compared to both reference lakes (though the critical effect size was not exceeded). Since all effluent quality criteria were met, and since no differences were found for any other metric evaluated across both fish species, these changes are not expected to be mine-related.

Changes in forage fish populations (primarily slimy sculpin) in WTS and Kangislulik Lake are also monitored in both Kangislulik and flood zone lakes through a study under the Fish Habitat Offsetting Plan (2018 – 2021; C. Portt & Associates, 2018) and through the Fish Habitat Offsets Monitoring Plan (FHOMP; 2022 & 2023). Study results to date have confirmed the presence of small-bodied fishes in newly created shoreline habitat at catch rates and size ranges that appear no lower than reference areas. The research study is expected to be completed in 2026, at which time full results will be available.

Changes in large-bodied fish (lake trout) in flood zone lakes are further monitored through the FHOMP, and were reported to DFO in April, 2024 ("*An Assessment of the Effect of Increased Water Elevations on Indicators of the Productivity of the Lake Trout (Salvelinus namaycush), Relative to Baseline and Reference Lakes at the Whale Tail Mine"* – C. Portt and Associates and Kilgour and Associates, April 30th, 2024). Results indicate that Lake Trout density and growth rate were higher post-flooding than during the baseline period and that recruitment has increased. These impacts were considered most likely due to increased nutrients in flood zone lakes, and are expected to be temporary.

3.3.1.4 Management Actions

Based on results of CREMP sampling in 2025, the Level 0 (routine sampling) water management strategy is in effect for 2026 according to the Whale Tail Adaptive Management Plan. This is indicated since total phosphorus (and arsenic) at WTS and Kangislulik Lake are within normal operating ranges. Based on results of this AEMP analysis (no evidence of ongoing and/or unanticipated mine-related effects to receptors), no changes to adaptive management actions are planned at this time and trends in nutrients will continue to be tracked in 2026.

3.3.2 Changes in Conventional Parameters, TDS, and Major Ions

Similar to previous years and similar to the Meadowbank impact-area lakes, CREMP trigger values were exceeded along with statistically significant increases from baseline/reference values at near and mid-field areas WTS, A20, KAN, A76, and NEM for conventional parameters (alkalinity, conductivity, hardness), TDS, and constituent major ions (calcium, potassium, magnesium, sodium). Importantly, none have effects-based thresholds, and changes are not expected to result in adverse effects to aquatic life. Nevertheless, causation is explored here through a review of other AEMP monitoring results.

No triggers are applicable to this variable group outside the CREMP, so Table 7 is restricted to that program.

Table 7. Summary of monitoring results across AEMP programs related to conventional parameters, TDS, and constituent major ions.
Note: No triggers are applicable to this variable group outside the CREMP.

Stressor Variable Group: Conventional Parameters, TDS, and Major Ions					
Program	**Magnitude**	**Spatial Scale**	**Temporal Trend**	**Causation**	**Uncertainty**
CREMP	1	Large	Stable/Increasing	High	?

Magnitude:
n/a – not evaluated/no applicable trigger
0 – no exceedance
1 – early warning trigger exceeded, or change from baseline
2 – management threshold exceedance (or change from baseline exceeding magnitude of concern)

Spatial Scale:
n/a – no magnitude of effect, therefore not evaluated
small – localized scale
moderate – sub-basin to basin scale
large – basin to whole lake scale

Temporal Trend Indicators:
n/a – no magnitude of effect, therefore not evaluated
Stable – no changes year-over-year
Increasing – year-over-year increases
Decreasing – year-over-year decreases

Causation Ratings:
n/a – no magnitude of effect, therefore not evaluated
Low – no evidence for a mine-related source
Moderate – some likelihood of a mine-related source
High – the source of the problem is very likely to be mine-related

Uncertainty Ratings (confidence in all other findings):
? – low uncertainty
?? – moderate uncertainty
??? – high uncertainty

The conceptual site model presented in Table 8 assists in understanding the possible linkages (i.e., effect to receptors from the source). As described in previous years, similar changes have been observed at the Meadowbank site, and it is likely that they are related to a combination of direct impacts of construction activities (historical) and inputs from dewatering and effluent discharge. All available monitoring results related to the identified potential sources/transport pathways, stressors, and receptors for 2025 are reviewed in text format below.

Table 8. Integrated conceptual site model for AEMP assessment of observed changes in conventional parameters, TDS and related major ions at the Whale Tail site (2025 results unless indicated).

Source	Transport Pathways	Medium / Stressor	Narrative	Magnitude	Spatial Scale	Link to Source	Receptor	Narrative	Magnitude	Spatial Scale	Link to Stressor
		Surface Water									
Effluent, Managed Non-Contact Water/Runoff/ Flooding? →	Effluent discharge, runoff to surface water →	Conductivity, hardness, major ions, TDS	All near-, mid-, and far-field lakes have higher concentrations of dissolved solids and constituent major ions (e.g. calcium and magnesium) compared to baseline/reference conditions. There are no effects-based thresholds for these parameters.	T, SD	All	High (see text) →	**Primary Production** [a]Phytoplankton biomass	No differences in biomass.	0	N/A	N/A
							[a]Phytoplankton taxa richness	No differences in taxa richness.	0	N/A	N/A
							[d]Periphyton biomass	Seasonal growth on floating artificial substrate appears greater in WTS and A20 compared to reference lakes (2023).	Qual	N/A	N/A
							[c]Effluent sub-lethal toxicity (algal and macrophyte growth inhibition)	No growth inhibition in EEM Cycle 2 Report (2021 - 2023).	0	N/A	N/A
							Secondary Production [c]Zooplankton sub-lethal toxicity (*Ceriodaphnia dubia*) [c]Zooplankton acute lethality (*Ceriodaphnia dubia, Daphnia magna*)	Inhibition of reproduction in *C. dubia* in 3 of 6 tests for EEM Cycle 2 (2021 - 2023 data). Not consistent with in-situ invertebrate study results. No acute lethality in EEM Cycle 2 (*C. dubia*, 2021 - 2023) or MDMER toxicity testing (*D. magna*).	0	N/A	N/A
							[a,c]Benthic invertebrate density and richness	[c]Increased density in effluent discharge area in KAN (2023). [a]Increased abundance and richness at some CREMP lakes (especially NEM, KAN).	TT, SD	2+	Low - Moderate (see text)
							Fish [c]Sublethal toxicity (Fathead minnow) [c]Acute lethality (Fathead minnow, Rainbow trout)	No sublethal toxicity or acute lethality in EEM Cycle 2 (fathead minnow, 2021 - 2023) or MDMER toxicity testing (rainbow trout).	0	N/A	N/A
							[c,d]Population metrics (e.g. relative abundance (CPUE), length frequency)	[c]No consistent differences in lake trout or slimy sculpin growth metrics exeeding the critical effect size (KAN vs ref lakes, 2023). [d]Various indices indicate stimulation effect for growth of Lake Trout in flood zone lakes (2023).	Qual	N/A	N/A

Associated monitoring program:

a	Core Receiving Environment Monitoring Program
b	Water Quality and Flow Monitoring
c	Effluent-Related Monitoring
d	Fish Habitat Offsets Monitoring
e	Groundwater Monitoring
f	WTHR and Quarries Water Quality Montoring
g	Mercury Monitoring Program
h	Blast Monitoring

Magnitude

0	No trigger exceedance
T	Exceeds early-warning trigger.
TT	Exceeds effects-based threshold.
SD	Statistically significant difference from baseline/reference
Qual	Qualitative assessment

Spatial Extent

1 - Occurs at one near-field sampling area only
2+ - Multiple near-field areas and/or mid-field areas
All - Extends to far-field areas

3.3.2.1 Source Evaluation

Conductivity is a composite variable that responds positively when concentrations of ionic compounds increase (e.g., chlorides, sulphates, carbonates, sodium, magnesium, calcium, potassium and metallic ions), so conductivity is used here to broadly assess potential causation of changes in those parameters because it is regularly measured across monitoring programs. While the CREMP conductivity trigger (48.6 µS/cm; set at the 95^{th} centile of baseline data), does not specifically apply to effluent, managed surface water, or seepage results, it is used here to determine the potential for a source to be contributing to observations of water quality changes in the receiving environment programs.

Effluent Monitoring Results

WTS: Water chemistry analysis for effluent discharged to WTS (ST-WT-24) indicated average annual conductivity (357 µS/cm) in excess of the CREMP trigger of 49 µS/cm.

KAN: Similarly, average annual conductivity for effluent discharged to Kangislulik Lake (ST-WT-2a; 459 µS/cm) exceeded the CREMP trigger in 2025.

Managed Surface Water and Seepage Monitoring Results

WTS and KAN: No sources of managed non-contact surface water (e.g. diversion ditches) or seepage report directly to the receiving environment of WTS or Kangislulik Lake, other than the Whale Tail South Channel which connects the two lakes. Annual average field-measured conductivity in the channel (ST-WT-13; 78 µS/cm) exceeded the CREMP trigger of 49 µS/cm in 2025.

NEM: Managed non-contact surface water is directed towards Nemo Lake via the IVR Diversion Channel. Water quality monitoring in 2025 indicated average annual conductivity exceeded the CREMP trigger, with a concentration of 70 µS/cm.

Summary

Overall, these results support previous general conclusions that the observed changes continue to be influenced by a combination of ongoing effluent discharge and water management activities (including non-contact water diversions and flooding), as well as potentially historic construction and dewatering activities.

3.3.2.2 Exposure Evaluation

CREMP-measured annual average conductivity (tracked here as an indicator variable) in near- and mid-field lakes WTS, KAN, NEM, A20, and A76 was measured at 95 - 176 µS/cm. Results for far-field station DS-1 were closer to the trigger, at 51 µS/cm. Overall it is noted in the CREMP report that the most pronounced increases in major ions and related parameters have occurred in WTS and A20, and to a lesser extent at KAN, NEM, and A76.

Conductivity is additionally measured monthly during open water in the receiving environment at the outlets for Lakes A16 (aka Kangislulik Lake; ST-WT-15) and A15 (next lake downstream, prior to A76; ST-WT-14), under the Water Quality and Flow Monitoring Plan. Annual mean concentrations at these locations (109 and 107 µS/cm) also exceeded the CREMP trigger of 49 µS/cm.

Finally, similar results were measured in EEM exposure area monitoring in WTS (station WTSE-1) and KAN (station EEM-7-MAME-2), with annual averages of 190 and 135 µS/cm, respectively.

3.3.2.3 Effects Evaluation

As described in the CREMP report, the parameters in this group with trigger exceedances in 2025 do not have effects-based thresholds (e.g., CCME water quality guidelines), so toxicity-related impacts are not anticipated. As discussed in that report, major ions are essential elements, and in oligotrophic freshwater lake environments adverse effects on primary producers and secondary consumers (e.g., zooplankton) are more commonly associated with major cation deficiency than enrichment. Review of monitoring results for receptor species (Section 3.3.1.3), largely indicates apparent increases in measurement endpoints (e.g. density, growth, biomass) historically in the impacted lakes and no ongoing effluent-related toxicity in laboratory tests. Overall, these trends are similar to those observed in the Meadowbank near-field CREMP lakes. Based on results of a review in 2019 (Appendix F of the 2023 CREMP Report), there is no evidence to suggest that measured concentrations of these parameters are resulting in adverse ecological effects.

3.3.2.4 Management Actions

Since these parameters are not present or anticipated to occur at concentrations that could be considered to cause adverse ecological effects, no changes in management actions are planned as a result of this evaluation.

3.3.3 Changes in Lithium

In 2025, annual average concentrations of total and dissolved lithium in WTS and KAN (0.0024 to 0.0027 mg/L) exceeded the CREMP triggers (0.0020 mg/L) at WTS and KAN, and were statistically greater than baseline/reference. Peak concentrations for these lakes occurred in 2019 and appear to have stabilized since 2022. Results since that time have marginally exceeded the CREMP trigger, similar to 2025.

In 2019, concentrations of total lithium were measured approximately weekly during Mammoth Dike construction and results suggested that slightly elevated concentrations of lithium in WTS and/or KAN early in the 2019 season may have been caused by dike construction and WTN dewatering activities. In 2025, annual average concentrations of lithium in effluent discharge to WTS and KAN continued to exceed CREMP triggers (0.008 mg/L and 0.012 mg/L, respectively), indicating that it likely continues to be a source of this metal to the immediate receiving environment.

Lithium does not have an effects-based threshold (CCME water quality guideline), but as discussed in the 2025 CREMP Report, a USEPA factsheet reports no-observed effects concentrations for sub-lethal toxicity tests with a zooplankton and a fish at two to three times the order of magnitude measured at the Whale Tail site. Based on this and since no apparent inhibitory effects on lower trophic levels are identified (as discussed in Section 3.3.1.3), this trigger exceedance is not investigated further. Trends will continue to be monitored through the CREMP but no adaptive management actions are planned at this time beyond routine monitoring.